

# **AQUIND** Limited

# **AQUIND INTERCONNECTOR**

# Habitats Regulations Assessment Report

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(g)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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# AQUIND Limited AQUIND INTERCONNECTOR

Habitats Regulations Assessment Report

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# **ABBREVIATIONS**

Abbreviation	Term in full
AA	Appropriate Assessment
AC	Alternating Current
ВАР	Biodiversity Action Plan
BERR	Department for Business Enterprise and Regulatory Reform
BoCC	Birds of Conservation Concern
вто	British Trust for Ornithology
CBRA	Cable Burial Risk Assessment
CIEEM	Chartered Institute for Ecology and Environmental Management
CLV	Cable Lay Vessel
cSACs	Candidate Special Areas of Protection
DC	Direct Current
DCO	Development Consent Order
DO	dissolved oxygen
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMV	Excavator Mounted Vibrator
ES	Environmental Statement



Abbreviation	Term in full
ESCP	East Solent Coastal Partnership
EU	European Union
GIS	Geographical Information Systems
HDD	Horizontal Directional Drilling
HRA	Habitat Regulations Assessment
н	High Voltage
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
ICES	International Council for Exploration at Sea
ICOL	Inchcape Offshore Limited
IMO	International Maritime Organisation
INIS	Invasive Non-Indigenous Species
IQI	Infaunal Quality Index
IROPI	Imperative Reasons of Overriding Public Interest
ISM	International Safety Management
JNCC	Joint Nature Conservation Committee
КР	Kilometre Point
LNR	Local Nature Reserve
LPA	Local Planning Authority
LSE	Likely Significant Effect



Abbreviation	Term in full
LWS	Local Wildlife Site
MCZ	Marine Conversation Zone
MFE	Mass Flow Excavation
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
ММО	Marine Management Organisation
MW	Megawatts
NG	National Grid
nmi	Nautical miles
nmi²	Nautical miles squared
NOAA	National Oceanic and Atmospheric Administration
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project
OOS	Out of Service
OSPAR	Oslo and Paris Conventions
OWF	Offshore Wind Farm
PA	Planning Act
РАН	Pesticides and Polycyclic Hydrocarbons
PCC	Portsmouth City Council
PCI	Project of Common Interest



Abbreviation	Term in full
PINS	Planning Inspectorate
PLGR	pre-lay grapnel run
pSPAs	Potential Special Protection Areas
PTS	permanent threshold shift
RSPB	Royal Society for the Protection of Birds
RTE	Réseau de Transport d'Électricité
SACs	Special Areas of Conservation
SACO	Supplementary Advice on Conservation Objectives
SAMM	Suivi Aérien de la Mégafaune
SCANS	Small Cetaceans in European Atlantic Waters and the North Sea
SCIs	Sites of Community Importance
SEL	sound exposure level
SINC	Site of Importance for Nature Conservation
SNCB	Statutory National Conservation Body
SNH	Scottish Natural Heritage
SoCG	Statement of Common Ground
SPAs	Special Protection Areas
SPL	Sound Pressure Level
SSC	Suspended Sediment Concentrations



Abbreviation	Term in full
SWBGS	Solent Waders and Brent Goose Strategy
ТЈВ	Transition Joint Bay
тос	Total Organic Carbon
TSHD	Trailing Suction Hopper Dredger
UK	United Kingdom
VSC	Voltage Source Converter
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WSP	WSP Parsons Brickerhoff
ZOI	Zone of Influence
ZSC	Zone Spéciale de Conservation



# **EXECUTIVE SUMMARY**

The following assessment addresses the requirements, in respect of the AQUIND Interconnector (the Proposed Development), under regulation 5(2)(g) of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 to provide information that will be required by the Competent Authority to enable it to undertake an Habitats Regulations Assessment ('HRA') Screening to determine whether an Appropriate Assessment ('AA') is required, and where one is required, to undertake an AA in accordance with regulation 63(2) of the Habitats Regulations and 28(3) of the Offshore Habitats Regulations.

AQUIND Interconnector (the 'Project') consists of the construction of a 2,000 MW bidirectional electrical power transmission link between the South Coast of England and Normandy in France and would facilitate the import and export of electricity between the UK and France. The Proposed Development includes that part of the Project located within the UK and the UK Marine Area, for which development consent is sought by the Application.

This assessment – and the Environmental Impact Assessment ('EIA') – uses the Rochdale Envelope approach to consider a range of maximum worst case design parameters for each of the main receptor groups (marine mammals, migratory fish, Annex I habitats and passage/wintering/breeding birds) considered to be potentially impacted by the Proposed Development.

For onshore assessments, the study area includes the onshore and intertidal areas adjacent to the Order limits of the Proposed Development onshore, with all European sites within 10 km considered. For the marine assessments, the study areas are receptor specific ranging from the marine area around the Proposed Development, the wider Channel, the UK and French marine areas and rivers that flow into the Channel for Annex I habitats, migratory fish and marine mammals and the mean-maximum foraging range and migratory range of breeding seabirds and passage/wintering seabirds.

Surveys for onshore and intertidal breeding and wintering birds were undertaken.

Twenty designated sites (SAC, SPA, Ramsar and pSPA) within the UK, France and Channel Islands were screened as sites for which there was potential for a likely significant effect as a result of the construction, operation and decommissioning of the Proposed Development alone and in combination with other projects and plans.

Following the consideration of likely significant effect, the potential for an adverse effect on the integrity of eleven UK designated sites (SACs, SPA and pSPA) and eight French designated sites (SPAs, SPAs and Ramsar) and a Ramsar in the Channel Islands was assessed for both the Proposed Development alone and in combination with other plans and



projects. Effects considered included disturbance and displacement, indirect effects, and accidental spills and litter on ornithological features; pollution on Annex I habitats, migratory fish and marine mammal features; invasive species, sediment deposition, and increased suspended sediments on Annex I habitats; and increased suspended sediments on migratory fish features.

For the sites and features assessed, it was concluded that the Proposed Development will not have an adverse effect on site integrity alone or in combination with other projects and plans.

Statutory Nature Conservation Bodies, the Planning Inspectorate and interested parties have been consulted and have commented on a draft version of this HRA Report. Those comments have been used to develop this final revision of the HRA Report for the Proposed Development.



# 1. **INTRODUCTION**

### 1.1. PURPOSE OF THIS REPORT

- 1.1.1.1. This Habitats Regulations Assessment (HRA) Report is submitted on behalf of AQUIND Limited (the 'Applicant') to accompany an application (the 'Application') for a Development Consent Order ('DCO') submitted to the Secretary of State ('SoS') for Business, Energy and Industrial Strategy ('BEIS'). The application relates to the UK elements of AQUIND Interconnector which constitutes the Proposed Development.
- 1.1.1.2. This HRA Report provides information that will be required by the Competent Authority to enable it to undertake HRA Screening to determine whether an Appropriate Assessment ('AA') is required, and where one is required, to undertake an AA in accordance with regulation 63(2) of the Habitats Regulations and 28(3) of the Offshore Habitats Regulations. This HRA Report is also submitted in accordance with the requirements of regulation 5(2)(g) of the Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulation 2009.

### 1.2. **PROJECT OVERVIEW**

- 1.2.1.1. AQUIND Limited (AQUIND) is a UK-registered company with the sole business of developing and operating Aquind Interconnector.
- 1.2.1.2. AQUIND Interconnector consists of the construction of a 2,000 MW bi-directional electrical power transmission link between the South Coast of England and Normandy in France and would facilitate the import and export of electricity between the UK and France, helping to meet the electricity needs of both countries (the "Project"). The Project will have the capacity to transmit 16,000,000 Mwh of electricity, which equates to 5% and 3% of the total consumption of the UK and France respectively. The indicative location of the project is shown in Plate 1.1 below.



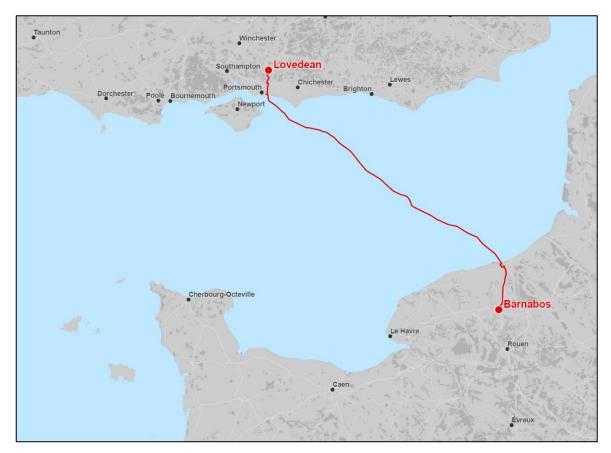


Plate 1.1 - AQUIND Interconnector between the UK and France – indicative location

1.2.1.3. The Project has been selected as a Project of Common Interest ('PCI') by the European Union. To be selected as a PCI and project must have a significant impact on energy markets and market integration in the UK and France, boost competition on energy markets and help the EU's energy security by diversifying sources as well as contribute to the EU's climate and energy goals by integrating renewables.

1.2.1.4.

The Proposed Development includes:

- High Voltage Direct Current ('HVDC') marine cables from the boundary of the UK exclusive economic zone ('EEZ') to the UK at Eastney in Portsmouth;
- Jointing of the HVDC marine cables and HVDC onshore cables;
- HVDC onshore cables;
- A Converter Station;
- High Voltage Alternate Current ('HVAC') onshore cables and associated infrastructure connecting the Converter Station to the GB Grid at Lovedean Substation; and



- Smaller diameter fibre optic cables together with the HVDC and HVAC cables and associated infrastructure ('FOC Infrastructure').
- 1.2.1.5. Chapter 3 (Description of the Proposed Development) of the Environmental Statement ('ES') ([insert document reference]) contains a detailed description of the Proposed Development for which development consent is sought by the Applicant.

### 1.3. STRUCTURE AND CONTENTS OF THIS REPORT

- 1.3.1.1. This report has been written in partnership by Natural Power Consultants and WSP. Natural Power Consultants has undertaken the assessments that relate to the marine works of the Proposed Development and WSP has undertaken the assessments that relate to the onshore works.
- 1.3.1.2. This document comprises the following sections;
  - The Habitats Regulations Assessment Process
  - Project Description
  - Environmental Baseline (Marine)
  - Environmental Baseline (Onshore)
  - Identification of European Sites and Potential Effects
  - Determination of Likely Significant Effects ('LSEs')
  - In combination Assessment
  - Summary of LSEs
  - Determination of Potential Adverse Effects (Marine)
  - Determination of Potential Adverse Effects (onshore)
  - References



# 2. THE HABITAT REGULATIONS ASSESSMENT PROCESS

### 2.1. LEGISLATIVE CONTEXT

- 2.1.1.1. The Habitats Directive (92/43/EEC), on the conservation of natural habitats and of wild fauna and flora, protects habitats and species of European nature conservation importance. The Council Directive (2009/147/EC) on the conservation of wild birds (the 'Birds Directive') seeks to protect all wild birds and also sites important to the protection of wild birds. The Ramsar convention seeks to protect wetlands of international importance, under which the UK has to meet relevant obligations. Together the Habitats Directive, the Birds Directive and the Ramsar Convention establish a network of internationally important sites, designated for their ecological status.
- 2.1.1.2. Special Areas of Conservation ('SACs') are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas ('SPAs') are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of designated sites. Ramsar sites of wetland importance are protected by the Ramsar Convention.
- 2.1.1.3. Terrestrial areas of the UK and territorial waters out to 12 nautical miles ('nmi') are covered under The Conservation of Habitats and Species Regulations 2017 (herein referred to as the Habitats Regulations) which transpose the Habitats and Birds Directive. The Habitats Regulations protect 'European sites', which in accordance with regulation 8 of the Habitats Regulations comprise SACs, SPA's and Sites of Community Importance ('SCIs').
- 2.1.1.4. The Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Offshore Habitats Regulations) transpose the Habitats and Birds Directives into national law, covering waters beyond 12 nmi, to the extent of the British Fishery Limits and UK Continental Shelf Designated Area. The Offshore Habitats Regulations protect 'European offshore marine sites', as that term is defined by regulation 18 of the Offshore Habitats Regulations.
- 2.1.1.5. In addition, UK Government policy (e.g. National Planning Policy Framework ('NPPF')) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them.



The Government also affords the same level of protection to potential SPAs (pSPAs) and candidate SACs ('cSACs') as for fully designated sites.

2.1.1.6. Under the Habitats Regulations and the Offshore Habitats Regulations, before granting approval (i.e. planning permissions, licenses and consents) for a development likely to have a significant effect on any protected site, an AA must be made by a Competent Authority of its implications for the site in view of that site's conservation objectives.

### 2.2. HABITAT REGULATIONS ASSESSMENT

- 2.2.1.1. The Habitat Regulations and Offshore Habitats Regulations require that wherever a project that is not directly connected to, or necessary for, the management of a European site or a European offshore marine site, as the case may be, is likely to have a significant effect on the conservation objectives of the site (directly, indirectly, alone or in combination with other plans or projects) an AA must be undertaken by the Competent Authority (Regulation 63 of the Habitats Regulations and Regulation 28 of the Offshore Habitats Regulations). The AA must be carried out before any consent or authorisation can be given for the project.
- 2.2.1.2. The Planning Inspectorate ('PINS') Advice Note Ten 'Habitat Regulations Assessment relevant to nationally significant infrastructure projects' (version 8, November 2017), defines the HRA process as a multi stage process that helps determine Likely Significant Effects ('LSE') and (where appropriate) assesses adverse effects on the integrity of a European site (or a European offshore marine site, as the case may be), examine alternative solutions, and provide justification for Imperative Reasons of Overriding Public Interest ('IROPI'). This constitutes a fourstage process as summarised below and illustrated in Plate 2.1.
  - HRA Stage 1 Screening: Screening for LSE (alone or in combination with other projects or plans);
  - HRA Stage 2 Appropriate Assessment: Assessment of implications of identified LSEs on the conservation objectives of a European site to ascertain if the proposal will adversely affect the integrity of a European site;
  - HRA Stage 3 Assessment of Alternative Solutions (where it cannot be ascertained that the proposal will not adversely affect the integrity of a European site); and
  - HRA Stage 4 Assessment of IROPI (where no alternative solutions are identified).



- 2.2.1.3. All four stages of the process are referred to as the Habitats Regulations Assessment (HRA), distinguishing the process as a whole from the one stage within it referred to as the "Appropriate Assessment" (AA).
- 2.2.1.4. The integrity of a site is the coherence of the site's ecological structure and function, across the whole of its area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated<sup>1</sup>.
- 2.2.1.5. An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation<sup>2</sup>.

<sup>2</sup> English Nature, 1997 – Habitats Regulations Guidance Note.

<sup>&</sup>lt;sup>1</sup> European Communities (2000) Managing Natura 2000 sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/CEE. EC



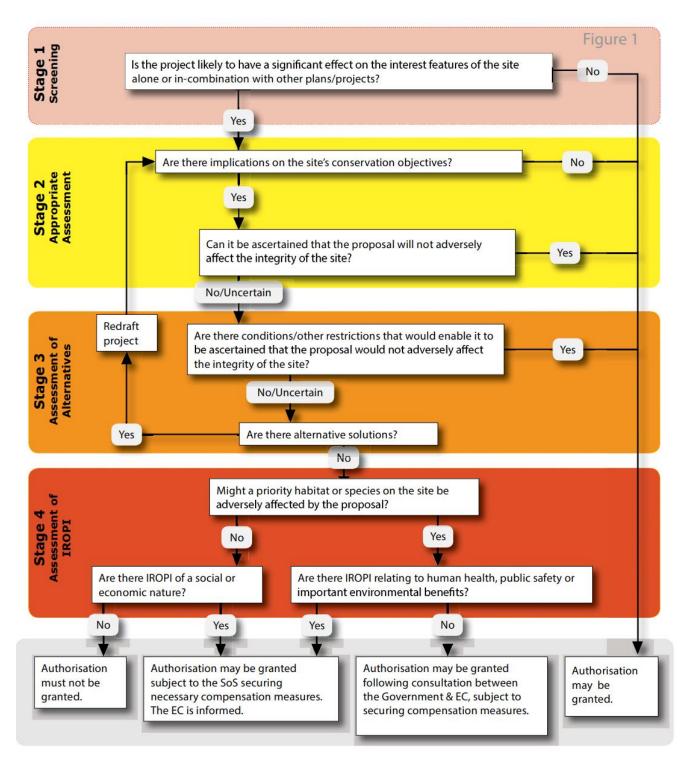


Plate 2.1 - Four Stage HRA Process (PINS, 2017)

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### 2.3. APPROACH TO SCREENING

- 2.3.1.1. Screening is a relatively coarse filter to identify those sites and features for which LSEs cannot be discounted. For the purposes of this report an initial pre LSE screening stage has been introduced into the process (see Section 6). This stage is essentially a site-identification / selection process, which, while it forms part of the overall LSE determination stage of HRA, has been separated out to refine the list of sites taken forward for a more detailed consideration of LSE in connection with the Proposed Development. Once a site/feature is identified, the screening exercise considers whether or not a significant effect can be foreseen, both directly and indirectly. A precautionary approach is followed, where it is not currently possible to exclude a LSE, then the site/feature is progressed to the AA Stage (Stage 2 of the HRA).
- 2.3.1.2. This precautionary approach has been taken in accordance with the PINS Note 05/2018<sup>3</sup>, disregarding all measures that could be construed as being introduced to to avoid or reduce an effect on a European site for the purpose of determining whether any LSEs arise in connection with the Proposed Development.
  - There are no LSEs on the site(s) and therefore no further assessment is required; or
  - LSEs on the site(s) cannot be discounted and will therefore be subject to an AA by the Competent Authority.
- 2.3.1.3. With respect to in combination effects, this screening report identifies the categories of plans and projects that will need to be considered but recognises that further discussion with local authorities and Statutory Nature Conservation Bodies (SNCBs) will be required to identify specific projects for inclusion in the in combination assessment. The HRA Report will include, for those sites screened into further assessment, a detailed in combination assessment drawing on the environmental impact assessments (EIAs) (including cumulative assessment) undertaken specifically for relevant plans or projects to understand the magnitude of those effects and whether they may lead to an adverse effect on site integrit.

### 2.4. CONSULTATION

2.4.1.1. AQUIND has taken a positive approach to pre-application consultation with the local community in the vicinity of the location of the Proposed Development and with all relevant stakeholders with the UK.

<sup>&</sup>lt;sup>3</sup> PINS Note 05/2018, November 2018 – Consideration of avoidance and reduction measures in Habitats Regulations Assessment: People over Wind, Peter Sweetman v Coillte Teoranta.



- 2.4.1.2. Preliminary meetings were held with Natural England on 6 and 13 February 2019 to discuss the onshore and marine environments respectively and the HRA required in connection with the Proposed Development. On 6 February WSP provided a presentation which included discussion on impacts on birds from onshore aspects of the Proposed Development including on SPAs and functionally linked habitat.
- 2.4.1.3. On 13 February, a Natural Power provided a presentation to direct the topics discussed during the meeting which included discussion on sites to be assessed for marine mammals, birds, migratory fish and benthic habitats in relation to the HRA Report.
- 2.4.1.4. Subsequent email communications with Natural England identified that litter and visual disturbance pressures needed to be assessed for tern species within the HRA (email received 13 March 2019). In addition, in July 2019 Natural England advised on the extent of Zones of Influence (ZOI) for marine ornithology;

"For the HRA, mean-max foraging ranges (Thaxter et al., 2012) will be used to assess whether any SPA birds are present within the ZOI for the cable route and other plans/projects. For the ES, a 10 km ZOI will be applied to the cable route for the purpose of screening other plans/projects (based on the understanding that disturbance/displacement can occur up to c.6 km from source). We are content with this difference in approach but have a couple of comments:

- It should be noted that some of the data used in Thaxter et al., (2012) is now out of date, although this principally relates to auks, gulls, gannets and shags - rather than terns which would be the key species of concern for the HRA. We are aware that some subsequent Sandwich tern tracking work has been undertaken, but it may not be published yet - so it might be worth checking.
- Regarding the proposal to apply the ZOI for breeding birds to non-breeding birds, our only thought is to double-check that there are no non-breeding species which have ranges in excess of the breeding bird ranges. Providing this can be confirmed, then the approach sounds suitable."
- 2.4.1.5. Subsequent to February 2019 meeting, Natural Power also produced and submitted a short consultation document to Natural England (on 2 April 2019) which provided evidence and rationale for the approach taken for pre-screening a number of SACs that possess marine mammal features such that they would not need any further assessment within the HRA.
- 2.4.1.6. This document was passed to the Natural England marine mammal specialist who responded on the 3 May 2019 by stating;

"The document clearly sets out the rationale for assessing potential connectivity with the four UK marine mammal SACs, concluding that potential impacts upon each of



these sites can be screened out. We welcome this additional information and agree with the document's conclusions. Our only comment is to ensure that this information is included in the ES/HRA Report (an appendix would be fine) for the purposes of the audit trail."

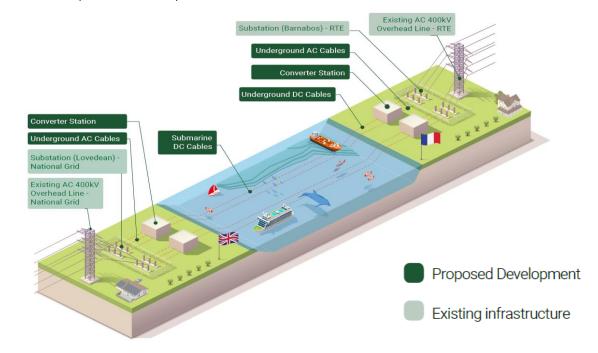
- 2.4.1.7. Information detailing the approach and outcomes of the pre-screening of SACS for which marine mammals are features is provided in Appendix 2 of this Report.
- 2.4.1.8. The Project will cross between two Member States which are the UK and France. It was awarded 'Project of Common Interest' (PCI) status and included on the third PCI list in March 2018, and has also therefore complied with the requirements of the Regulation on guidelines for trans-European energy infrastructure (EU 347/2013) (the Ten-E Regulations) in relation to consultation carried out both in the UK and in France.
- 2.4.1.9. On 2 April 2019, PINS issued a Transboundary Impacts Screening Matrix in accordance with regulation 32 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the "EIA Regulations"), notifying France, Spain, the Netherlands, Belgium, Denmark and Germany that in their view the Proposed Development is likely to have a significant effect on the environment in another EEA State, having taking a precautionary approach and the information provided by the Applicant in their request for an EIA scoping opinion. Spain confirmed they wished to participate in the EIA procedure for examining the DCO application as an interested party. Germany and Denmark confirmed they did not intend to participate in the EIA procedure. Belgium, France and the Netherlands did not respond to the notification provided to them by PINS. Is should be noted that the Secretary of State's duty under regulation 32 of the EIA Regulations continues throughout the application process.
- 2.4.1.10. Natural Power consulted with Natural England, Joint Nature Conservation Committee ('JNCC'), and the Environment Agency on the draft HRA Report in September 2019. The comments received and how they have been considered are detailed in Appendix 4 (Marine Consultation Responses) (document reference 6.8.3.4).
- 2.4.1.11. Natural Power also sent a draft copy of this HRA Report to the Alderney Wildlife Trust who acts on behalf of the States of Alderney as administrators for designated sites (see details of their response in Appendix 4). Natural Power also sent a summary of this report to French authorities (Direction régionale de l'Environnement, de l'Aménagement et du Logement) outlining the potential for LSEs on French designated sites.



# 3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

### 3.1. INTRODUCTION

3.1.1.1. AQUIND Interconnector (the Project) comprises a new marine and onshore High Voltage Direct Current ('HVDC') power cable transmission link between Normandy in France and Eastney, Hampshire, converter stations in both England and France and infrastructure necessary to facilitate the import and export of electricity between both countries (see Plate 3.1).



#### Plate 3.1 - The main elements of AQUIND Interconnector

3.1.1.2. The purpose of the Project is to make a significant contribution towards increasing the cross-border capacity between the UK and France (providing a net capacity of 2,000 megawatts ('MW'). Increasing cross border capacity, through the provision of interconnectors, improves competition in energy markets, delivers security and flexibility of energy supply in both countries as well as helping to fight climate change by integrating more renewable energy sources like solar and wind.



- 3.1.1.3. The Project has been awarded status of a Project of Common Interest ('PCI') by the European Union and was included on the Third PCI List in March 2018. To be selected as a PCI a project must have a significant on energy markets and market integration in the UK and France, boost competition on energy markets and help the EU's energy security by diversifying sources as well as contribute to the EU's climate and energy goals by integrating renewables.
- 3.1.1.4. The Project will be approximately 238 km in length and comprise the following Marine and Onshore components in France and UK (see Plate 3.1):
  - HVDC Marine Cables;
  - HVDC Onshore Cables;
  - Converter Stations;
  - HVAC Onshore Cables; and
  - associated infrastructure.
- 3.1.1.5. The French and UK elements of the Project require different consents and licences within the respective jurisdictions. It should be noted that a separate assessment in accordance with the Habitats Directive and the Birds Directive in connexction to ththe French elements of the Projecthas been undertaken to inform the French consenting process.

### 3.2. THE PROPOSED DEVELOPMENT

3.2.1.1. The Proposed Development includes that part of the Project located within the UK and the UK Marine Area, for which development consent is sought by the DCO Application.

The Proposed Development is broadly comprised of the Marine Components and the Onshore Components.

### 3.2.2. MARIE COMPONENTS

- 3.2.2.1. The marine elements will comprise four submarine cables between the UK and France, which can be bundled in pairs, together with smaller diameter fibre optics cables. The Marine Cable Route can be divided into the following sections:
  - Approximately 45 km within the UK territorial limit, i.e. 12 nmi from shore;
  - Approximately 64 km from the UK territorial limit to the boundary of the Exclusive Economic Zone ('EEZ');
  - Approximately 58 km from the boundary of the EEZ to the French territorial limit; and
  - Approximately 29 km within the French territorial limit, i.e. 12 nmi from shore.



- 3.2.2.2. The full project description is provided in Chapter 3 (Description of the Proposed Development) of the Environmental Statement ('ES'). A summary of the project description is described below in order to provide an overview of the Proposed Development and context to the HRA.
- 3.2.2.3. More detailed design envelope scenarios assessed per receptor group are presented within the relevant ES Chapters as follows:
  - Chapter 8: Intertidal and Benthic Ecology Habitats;
  - Chapter 9: Fish and Shellfish;
  - Chapter 10: Marine Mammals and Basking Sharks; and
  - Chapter 11: Marine Ornithology.
- 3.2.2.4. Important to note is a key difference between the design parameters used for the Stage 1 HRA assessment (LSE screening in Sections 6 and 7 of this document) and the ES assessments, in order to consider the European Court of Justice ('ECJ') decision People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17) (April 2018) which adjudged that mitigation should not be applied at LSE screening stage but as part of the AA stage.
- 3.2.2.5. The ES design envelope includes the requirement for the disposal of dredge material (potentially required as a result of sandwave clearance), within the proposed marine disposal area which is located within the Marine Cable Corridor between Kilometre Point ('KP') 21 and KP 109 (see Plate 3-2 below).
- 3.2.2.6. While the rationale for avoiding sediment disposal within the nearshore (landward of KP 21) was to reduce possible effects on water quality including Water Framework Directive ('WFD') waterbodies more broadly (rather than mitigating specific HRA effects), it is considered prudent to treat this approach as mitigation for HRA purposes.
- 3.2.2.7. Accordingly, the ZOI for identifying possible Annex I habitat SACs (Section 6) and for undertaking the LSE assessment (Section 7) uses a 25 km distance which is based upon sediment plumes from disposal taking place anywhere within the Marine Cable Corridor. The requirement for disposal activities to take place within the designated marine disposal area (between KP 21 and KP 109) is applied as mitigation at the AA stage (see Section 10.2.5 for further details) subject to the formal designation of the proposed marine disposal site.

### 3.2.3. ONSHORE COMPONENTS

3.2.3.1. In the UK, the following onshore components of the Proposed Development are proposed:



- Works at the existing National Grid Lovedean substation in Hampshire to facilitate the connection of the Project to the existing Great Britain electrical power transmission network, the National Grid;
- Underground high voltage alternating current (HVAC) cables, connecting the National Grid Lovedean substation to the proposed Converter Station;
- The construction of a Converter Station comprising a mix of buildings and outdoor electrical and telecommunications equipment.
- Two pairs of underground HVDC cables, each of which is paired with a smaller diameter fibre optic cables for data transmission, to run from the Converter Station to the Landfall site in Eastney (near Portsmouth), approximately 20 km in length (each); and
- Infrastructure to joint the onshore and marine HVDC cables together at the Landfall, and two Optical Regeneration Stations ('ORS') (one for each circuit) housed in separate buildings.
- 3.2.3.2. The full description of the Proposed Development is provided in Chapter 3 (Description of the Proposed Development) of the Environmental Statement (ES). A summary of this is included in Section 3.2 of this document in order to provide an overview of the Proposed Development and context to the HRA.
- 3.2.3.3. More detailed design envelope scenarios assessed per receptor group are presented within Chapter 16 of the ES: Onshore Ecology.

### 3.3. MARINE INFRASTRUCTURE

- 3.3.1.1. The Marine Cable Corridor is the corridor encompassing the marine geophysical, benthic and geotechnical survey areas (as shown in Plate 3.2) and is approximately 109 km long. This is 500 m wide from KP 0 to KP 8.6, then 520 m wide from KP 8.6 to the UK/France EEZ Boundary Line. The Marine Cable Corridor is also extended to include a 1,500 m diameter centred on the Atlantic Crossing cable crossing at approximately KP 72.5.
- 3.3.1.2. At the Landfall the ducts will be installed by Horizontal Directional Drilling ('HDD'). HDD can be used to allow cables to cross under certain constraints along the route namely water ways, railways and environmentally sensitive areas. HDD methodology will also be used to install the Marine Cables under the intertidal area. It is not determined yet whether the HDD direction will be onshore to marine, marine to onshore, or drilling from both ends. However, all assessments have considered that drilling from offshore to onshore would represent worst case. The HDD entry/exit pit locations will be located between KP 1 and KP 1.6 shown in Plate 3.2 and the majority



of works will be undertaken from a jack up vessel. The use of HDD avoids the need for any trenching operations on Eastney Beach or in the nearshore area.

- 3.3.1.3. HDD works will include use of a vibro-hammer (typically an excavator mounted vibrator ('EMV')) to install up to four trestles/lattice frameworks which will be required to support steel casings. Vibration methods are non-percussive. A pipe driving machine (also known as a hydraulic ram) will also be used to install up to four 36" diameter steel casing pipes/casings which will be required for HDD of each duct. Pipe driving machines also use vibration in order to push in/install casing pipes with an auger inside which removes the sediment.
- 3.3.1.4. The Marine Cable Route will be the final route for the cable that lies within the Marine Cable Corridor, comprising two HVDC cable circuits typically 50 m apart.
- 3.3.1.5. The indicative programme for construction activities for assessments runs from mid-2021 through to the end of 2023.

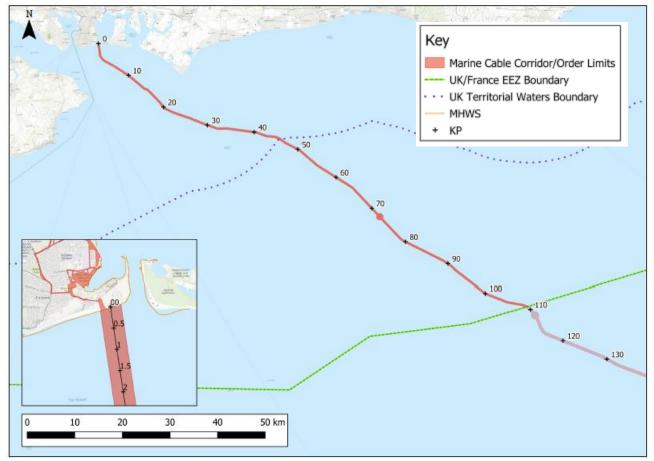


Plate 3.2 - UK Marine Cable Corridor (Mean High Water Springs = MHWS; Mean Low Water Springs = MLWS; KP = Kilometre Point)



#### 3.3.2. ROUTE PREPARATION FOR MARINE CABLES

- 3.3.2.1. Marine geophysical, geotechnical and benthic surveys have been undertaken specifically for the Proposed Development. Analysis of the survey data has identified that different types of preparation will be required prior to the installation of the marine cable:
  - Seabed debris (Out of Service ('OOS') cables, wires, abandoned fishing gear) clearance using a pre-lay grapnel run ('PLGR') will be undertaken to clear seabed debris in advance of the cable lay and burial.
  - Boulders Surface boulders will be removed by ploughing and/or grabs.
  - Sandwaves and large ripples where possible, the marine cables will be routed within the Marine Cable Corridor to avoid mobile bedforms and therefore minimise the requirement for clearance. In areas where sandwaves and ripples are present, and where re-routing of the Marine Cables to avoid such features is not possible, two clearance options are being considered to enable the cables to be buried to the required depth; Mass Flow Excavation ('MFE') and dredging (and disposal of material) using a trailing suction hopper dredger ('TSHD') vessel.
  - Uneven seabed due to the presence of gulleys, slopes and pits along the Marine Cable Corridor may require the placement of rock and/or the installation of mattresses, prior to cable installation, to create stable seabed surface to enable the safe installation of the Marine Cables.
  - Construction of crossing structures over in-service cables that are crossed by the Marine Cables.

#### 3.3.3. MARINE CABLE INSTALLATION

- 3.3.3.1. It is anticipated that the Marine Cables will be installed as two bundled pairs. Options for cable installation are dependent upon the characteristics of the seabed and the presence of seabed features and will be further informed through pre-construction surveys.
- 3.3.3.2. The Marine Cables will be carried on a cable lay vessel ('CLV') either on carousels or in cable tanks. The cables will be pulled via tensioners, overboard the vessel and on to the seabed. Depending on the burial technique adopted, trenching/burial can be simultaneous to cable lay, before cable lay (pre-lay or pre-cut trenching) or after cable lay (free-lay or post-lay burial).



#### Cable Burial

3.3.3.3. Cable burial can be achieved using ploughs, jet trenchers or mechanical trenchers.It is likely that a combination will be used for the Proposed Development to take into account different water depths and seabed conditions.

#### **Cable Burial Depth**

- 3.3.3.4. The Proposed Development requires installation of the four HVDC cables as two cable circuits, likely as bundled pairs. The spacing between two bundled pairs is driven by the operational spacing requirements of the installation equipment and will typically be approximately 50 m between each bundled pair.
- 3.3.3.5. Preliminary estimates suggest that the target depth to achieve burial protection against external hazards in UK waters generally varies from 1.0 m to 3.0 m. These target depths are from a stable seabed level, i.e. after clearance of significant sandwaves and large ripples and they have been informed through the results of the marine surveys and a Cable Burial Risk Assessment ('CBRA') carried out to date.

#### Non-Burial Protection Measures

3.3.3.6. Where it is not possible to bury the cable under the seabed to the target depth, nonburial protection such as tubular protection, mattressing, rock placement and/or rock/grout bags will be required to protect the cables from anthropogenic (i.e. fishing and vessel anchoring) and natural hazards (i.e. currents and mobile sediments).

#### **Cable Crossings**

3.3.3.7. The Marine Cable Corridor crosses one in-service cable; the Atlantic Crossing at KP 72.5 (red circle within the Marine Cable Corridor shown in Plate 3.2) a subsea telecommunications cable which links the USA with three European countries. A cable crossing agreement will be put in place with the relevant parties, in line with the relevant guidance. This agreement will detail the design and methodology for the cable crossing. It is anticipated that non-burial protection methods will be employed at the cable crossing.

#### Non-Burial Protection for Repair and Maintenance

3.3.3.8. The requirement for additional non-burial protection (currently proposed to be an additional 10% or 11 km of the cable route required) which may be needed during the first 15 years of the operational phase of the Proposed Development has been considered within the assessments undertaken.



#### 3.3.4. MAINTENANCE AND REPAIR

- 3.3.4.1. The Proposed Development has been designed so that routine maintenance to the Marine Cables is not required during their operational lifetime. However, there may be the requirement to undertake unplanned repair works, due to the following events:
  - Mechanical/electrical failure of components within the cables;
  - Exposure of, or damage to, the cables as a result of fishing activities and/or vessel anchoring; and
  - Exposure of cables due to changes in seabed morphology (e.g. areas of free spanning) or changes in hydrodynamics (e.g. increase in bed erosion due to dredging works in the vicinity of the Marine Cables).

#### 3.3.5. DECOMMISSIONING OF MARINE CABLES

- 3.3.5.1. The Marine Cables will be designed, manufactured and installed for a minimum service life of 40 years.
- 3.3.5.2. Decommissioning activities would be determined by the relevant legislation and guidance available at the time of decommissioning. In addition, a decommissioning plan will be developed and agreed with The Crown Estate. It is anticipated that a separate Marine Licence application for decommissioning works may be required closer to the time of decommissioning. A decommissioning plan would support the Marine Licence application and provide the level of detail that cannot be provided years in advance.

## 3.4. ONSHORE INFRASTRUCTURE

- 3.4.1.1. The Onshore Components of the Proposed Development are all elements of the Proposed Development above the Mean Low Water Spring ('MLWS') level (Figure 3-2).
- 3.4.1.2. In broad terms, the Proposed Development will comprise the following components:
  - HVAC cables (Onshore);
  - Converter Station;
  - HVDC cables (Onshore);
  - Infrastructure to joint the onshore and marine HVDC cables together at the Landfall, and
  - associated infrastructure.



#### HVAC Cables

- 3.4.1.3. To facilitate the connection to the National Grid Lovedean Substation it will be necessary to provide additional electrical infrastructure. The electrical connection equipment at Lovedean Substation is expected to be a combination of Air Insulated Switchgear ('AIS') and Gas Insulated Switchgear ('GIS').
- 3.4.1.4. There will be two 400 kV HVAC cable circuits that will connect the proposed Converter Station to the Lovedean Substation (each comprising three cables). Each HVAC Cable Circuit will sit in a single trench. One connection point is proposed to be located on the western side of the Lovedean substation and the other on the eastern side of the substation for each HVAC cable circuit.
- 3.4.1.5. The HVAC Cable Corridor through which the HVAC onshore cables will be installed is proposed within the area of land between Lovedean Substation and the proposed Converter Station.
- 3.4.1.6. The HVAC Cable Route, providing the link between the Converter Station and the National Electricity Transmission System ('NETS') via Lovedean Substation, will be located within the HVAC Cable Corridor and will be up to 1km in length. The AC Cables are proposed to exit the Converter Station on its eastern side.
- 3.4.1.7. Installed alongside the AC Cables may be an earth continuity conductor, which is an insulated metallic conductor to provide a path to earth for any fault currents.
- 3.4.1.8. There is also a requirement for a Fibre Optic Cable ('FOC') to be installed alongside each HVAC Cable Circuit in the same trench for control and protection and cable monitoring purposes.
- 3.4.1.9. Electric fields from the AC Cables will be contained by the cable's protective metal sheath.

#### **Converter Station Area**

- 3.4.1.10. A Converter Station is required to convert electricity from HVDC, used to transmit electricity between the UK and France, and HVAC, used to transmit electricity within the National Electricity Transmission System in both countries.
- 3.4.1.11. The proposed Converter Station footprint of 200 m x 200 m (4 ha) will be within a securely fenced compound. The finished ground floor slab level would be 300 mm above the Converter Station finished site level (i.e. top of gravel chipping).
- 3.4.1.12. The Converter Station consists of a number of interconnected components which need to be connected sequentially, with the built form for each dictated to a high degree by their function.
- 3.4.1.13. The components are arranged whilst considering the most efficient connection method between them and the minimum spacing of the equipment to ensure safe operation and maintenance.



- 3.4.1.14. The outdoor equipment which forms part of the proposed Converter Station will be similar to the equipment that is found within typical electrical substations, such as the adjacent Lovedean Substation. The 400 kV switchyard (transformers and AC filters will be located outdoors.
- 3.4.1.15. The Converter Station will be lit when necessary using energy efficient luminaries mounted atop mid-hinged columns to provide ease of maintenance. Lighting columns, up to 15 m high (see items 15 and 16 in Plate 3.9) are proposed to illuminate the outdoor areas of the Converter Station during emergency situations, such as an intruder or unplanned maintenance work. The lights are not intended to be used during normal operation.
- 3.4.1.16. Given the topography of the Converter Station Area, bulk earthworks would be required to create a level platform to accommodate the Converter Station.
- 3.4.1.17. Preliminary foundation assessment has concluded that the foundations are likely to be a combination of conventional ground bearing and piles dependent on the location, loading and acceptable settlement and differential settlement.
- 3.4.1.18. The construction of the platform for the main Converter Station site will be one of the initial activities undertaken. It is usual/standard practice for the site establishment, fencing/hoarding, bulk earthworks (and related drainage works) and site access road works to be undertaken as an initial enabling works preparation contract. This allows construction works to concentrate on the activities which construct the site working platform and access, the completion of which allows the rest of the main site works to commence.
- 3.4.1.19. Landscaping (including reprofiling if/where appropriate and associated planting) is proposed around the perimeter of the Converter Station compound and at other necessary/appropriate locations.
- 3.4.1.20. FOC infrastructure will be used for communications between the French and UK Converter Stations in connection with the control and protection systems, and hence are required to be installed with both HVAC and HVDC Cables. Additionally, the FOC will continue to monitor the condition of both the Onshore and Marine Cables.
- 3.4.1.21. The FOC will have sufficient fibres to accommodate levels of redundancy for failures, and it is also the intention that fibres within the cable may be used for commercial telecommunications purposes. The industry standard for the amount of fibres within a single cable continues to increase as technology develops.
- 3.4.1.22. Two Telecommunications Buildings (one for each HVDC Circuit) are proposed to be located in close proximity to the Converter Station to house required telecommunications equipment. The Telecommunications Buildings associated with the FOC are anticipated to be located outside the main Converter Station security fence. This is to enable the equipment to be more easily accessible for maintenance



purposes and in connection with the proposed use of fibres for commercial telecommunications purposes.

- 3.4.1.23. Each Telecommunications Building will have a maximum footprint of 8 m long x 4 m wide x 3m high and will also have secure fencing, access and parking for up to two vehicles for maintenance purposes. It is currently anticipated that the compound for the Telecommunications Buildings would have a maximum size of 10 m x 30 m.
- 3.4.1.24. The proposed access to the Converter Station for construction and operation will be taken from Broadway Lane and Day Lane, in the vicinity of the junction of these two highways.
- 3.4.1.25. The Access Road to the Converter Station will be approximately 1.2 km in length, and is expected to be a standard width (no wider than 7.3 m) suitable for transportation of Heavy Goods Vehicles ('HGVs') and Abnormal Indivisible Loads ('AIL').

#### **Onshore Cable Corridor**

- 3.4.1.26. The Onshore Cable Corridor represents the maximum extent of the area within which the Onshore HVDC Cables may be located, otherwise described as the limits of deviation. It is necessary to ensure flexibility for the siting of the Onshore HVDC Cables within the limits of deviation so as to ensure statutory undertaker apparatus can be effectively navigated and the installation of the Onshore HVDC Cables can be optimised by the chosen contractor following the making of the Order.
- 3.4.1.27. Two Onshore HVDC Cable Circuits are proposed to be installed in the Onshore Cable Corridor between Converter Station and the Landfall.
- 3.4.1.28. Each Onshore HVDC Cable Circuit will contain two HVDC Cables and one FOC and will be installed independently from one another. Each circuit could be installed at different times by different contractors.
- 3.4.1.29. Where necessary, a spacing of approximately 5 m is maintained between the trenches, to ensure the thermal independence of each circuit. Each excavated trench would be approximately 0.7 m in width, but could increase to 1 m in order to facilitate the cables being installed deeper, when navigating existing utility services.
- 3.4.1.30. For the majority of the Onshore Cable Route the Onshore HVDC Cables will be installed in excavated trenches. Rather than being laid in the trench, a form of housing (known as cable ducts) will be installed in the trenches. At a later date after sections of ducts have been installed, lengths of cables will be pulled through the ducts.

Due to the significant number of existing utility services within the Onshore Cable Corridor, it is expected that the installation rate for cable ducts for one circuit will be approximately 18 m - 30 m per day and typically in 100 m sections, within urban areas and approximately 50 m per day in open countryside. These typical installation



rates are per gang per shift and are dependent upon the level of obstacles and utility services encountered within the road or constraints that need to be observed to minimise the impacts during construction.

- 3.4.1.31. Joint Bays will be required at points along the route, and these will be used for pulling the cable through the cable ducts before joining one section of cable to another. The number of joint bays along the length of the cable route is dictated by the length of cable that can fit on a cable drum (the drum-shape reel on which the cable is stored prior to installation) and limits to the pulling tension required to pull the cable through the ducts. Joint Bays are likely to be required every 600m to 2000m along the Onshore HVDC Cable Circuits and will be positioned in highway verges, fields or car parks, where possible, to limit the need for road closures.
- 3.4.1.32. Link Boxes are typically located alongside a Joint Bay and are accessed via a manhole cover, installed at the same level of the surrounding ground. The dimensions of a Link Box are approximately 0.8 m x 0.8 m x 0.6 m. Link Pillars are frequently used on arable land (instead of Link Boxes) and they are normally located adjacent to hedgerows. They are accessed via doors at the front of the Link Pillar and the dimensions are approximately 1.0 m x 1.0 m x 0.6 m. The Link Boxes (or Pillars) are connected to the metal casing of the joint via underground bonding leads.
- 3.4.1.33. In certain areas the Onshore HVDC Cables will be installed in ducts using HDD or trenchless installation methods.
- 3.4.1.34. A trenchless technique is common for crossing of Network Rail assets in preference to HDD, and for this reason, micro-tunnelling is proposed to cross the railway north of Farlington Playing Fields. This alternative method of trenchless installation enables cables to be installed within ducts or pipes under a feature with minimal impact on that feature.
- 3.4.1.35. HDD is to be used to allow cables to cross under certain constraints along the route, namely waterways and environmentally sensitive areas. The HDD operation drill bores through the ground into which the cable ducts are pulled, through which the HVDC cable circuits will be pulled at a later date. The maximum depth will typically be between 5 m and 20 m, depending upon the length of the crossing and the local ground conditions.
- 3.4.1.36. The HDD operations require a suitable space for the temporary construction area, which can typically be up to approximately 50 m x 50 m depending on the length and size of the HDD works. The HDD operations require a working area to locate the drilling rig, water bowser/pump, generator, layout of ducts/pipes and other construction equipment.
- 3.4.1.37. The HDD bores that are required for each of the four HVDC Cables would have to be suitably spaced to achieve the required cable rating. Typically, this spacing is



approximately 5 m between adjacent ducts at the entrance and exit of the HDD and may increase to approximately 15 m depending on burial depth. The maximum width of cable reserve (area required for installing the four individual HVDC Cables with suitable spacing between taking in to account the maximum burial depth) has therefore been assumed to be approximately 60 m.

#### <u>Landfall</u>

- 3.4.1.38. The Landfall, located at Fort Cumberland car park south of Fort Cumberland Road in Eastney, was chosen following a detailed site selection process, as described in Chapter 2 of the ES (Consideration of Alternatives). The Landfall forms the transitional area between onshore HVDC cable circuits and the marine HVDC cable circuits. The marine HVDC cable circuits will be pulled ashore and jointed to the onshore HVDC cable circuits at the Transition Joint Bays ('TJBs').
- 3.4.1.39. HDD has been identified as the most suitable cable installation method at the Landfall, as opposed to open trenching methods. The use of HDD ducts avoids trenching through the beach and ensures that the cables are well protected in the shallow water immediately offshore. Cables installed by trenching could be vulnerable to damage, without the provision of additional protection.
- 3.4.1.40. The landward ends of the ducts will be approximately 200m inland of, and at a higher elevation than, the MHWS mark.
- 3.4.1.41. There will be two TJBs, one per HVDC Circuit. Each TJB will require an excavation of approximately 15 m x 5 m, to a depth of up to 1.75 m. Once the joint is complete, these excavations are backfilled and the land reinstated.
- 3.4.1.42. During the construction works, an area of approximately 15 m x 5 m adjacent to the TJBs is required for the jointing workshop, storage, parking, generator, welfare and security.
- 3.4.1.43. The cables will be pulled into the TJB, ready for jointing. During the cable pulling operation, an area of approximately 15 m x 12 m at either end of the TJBs are required for the cable drum and stand, plus space for delivery and offloading of cable drums (at one end) and the winch and anchor (at the other end).
- 3.4.1.44. The TJB installation works will take approximately 16 weeks (total for both circuits).
- 3.4.1.45. To amplify the signal of the FOC across the full distance of the Cable between the French and UK converter stations, up to two Optical Regeneration Stations ('ORS') (one for each circuit) are to be located within Fort Cumberland car park at Eastney.
- 3.4.1.46. Each ORS building will have dimensions of up to 10 m long x 4 m wide x 4 m high, which would house signal amplification and control equipment associated with the FOC, required to ensure the signal strength is adequate between the UK and French



Converter Stations. For safety purposes is necessary for them to be located 10 m apart.

3.4.1.47. The ORS compound construction is expected to take 12 weeks.

### Decommission

- 3.4.1.48. The Applicant is seeking consent for installation of the Proposed Development for an indefinite period. The Converter Station will be designed, manufactured and installed for a minimum service life of 40 years. Major items of equipment (e.g. transformers, circuit breakers, reactors) are designed to meet the lifetime of the Proposed Development and should remain operational for their design life subject to regular maintenance, inspection and availability of spare parts. If the Proposed Development and associated equipment is deemed to have reached the end of its design life, then the equipment may be decommissioned in an appropriate manner, and all materials reused and recycled where possible.
- 3.4.1.49. It is anticipated that the HVDC Cable's operational lifetime will exceed that of the Converter Station equipment, however at the end of the HVDC Cable's asset life, the options for decommissioning will be evaluated. The preferred option with the least environmental impact is to leave the cable in-situ within the buried ducts.

## 3.5. CONSTRUCTION PROGRAMME MARINE

- 3.5.1.1. The indicative worst-case programme, outlined in Table 3-1, has formed the basis of the HRA and allows for a more flexible approach to cable installation to accommodate disruptions and weather down time. In addition, some seabed preparation and installation activities may occur in the winter. Seabed preparation may also be phased more closely to cable lay and burial.
- 3.5.1.2. In Table 3-1, the orange bars represent tasks, whilst the green bars represent the individual activities within those tasks. These are current estimates for sequencing of activities, however, in order to maintain flexibility in the construction programme, these individual activities may occur at other times during the period allocated to the overall summary task, although sequencing is likely to remain similar.
- 3.5.1.3. Illustrative durations for activities are also provided, where work relating to the two cable pairs are undertaken separately, this is identified (e.g. pair 1 + pair 2, but they might still be undertaken 'in parallel' in terms of timing). Where they are anticipated to be undertaken at the same time i.e jointly (e.g. pair 1 and pair 2 in the same operation, which is more likely for sandwave clearance, boulders or cable crossing), they are shown cumulatively.

## Table 3.1- Indicative worst-case construction programme

			2	021		2	022			20	023			2	024	
Key Task	Related Activities	Indicative Duration (Weeks)	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Seabed Clearance /Preparation	All activities															
	Pre-lay grapnel run ('PLGR') and OOS cable recovery	4 (in parallel) 8 (separately)														
	Boulder clearance	15 (jointly)														
	Sandwave clearance	17 (jointly)														
	Cable crossing preparation	1 (jointly)														
Landfall Installation	All activities															
	Preparation, drilling and duct installation	44														
	Transition Joint Bay															
	ORS															
Marine Cable Installation (UK)	All activities															
	Nearshore cable lay and burial	14 (in parallel) 25 (separately)														
	Offshore cable lay	16 (in parallel) 30 (separately)														
	Offshore cable burial	4 (in parallel) 8 (separately)														
	Remedial protection*	21 (in parallel) 42 (separately)														



WSP/Natural Power

			2	021		20	022			2	023			2	024	
Key Task	Related Activities	Indicative Duration (Weeks)	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Cable Crossing	All activities															
	Construction of crossing	2 (jointly)														
Onshore Cable Installation (UK)	All activities															
	Route construction															
	Cable pulling															
	Jointing and terminating															
Converter Station Construction	All activities, including reinstatement															
	Enabling /Diversion Works															
	Main Civils Construction works															
	Mechanical and Electrical Work															

\* This includes transit to and from the quarry, and loadout, and therefore, depending on the actual requirements for remedial works, the total time in the corridor within this window is likely to be 6-10 weeks, and only for a few days on each occasion. If a larger vessel was used, the volumes would be the same, but fewer loads needed, possibly a small overall window and fewer visits to the Marine Cable Corridor, but the visit might be a few days longer.



WSP/Natural Power



## 3.6. CONSTRUCTION PROGRAMMEONSHORE

- 3.6.1.1. The indicative worst-case programme associated with the UK onshore elements of the Proposed Development, outlined in Table 3-2, has formed the basis of the HRA and allows for a more flexible approach to cable installation.
- 3.6.1.2. The indicative construction programmes take account of a number of constraints. These include constraints and assumptions associated with traffic management (further detail is contained within the Traffic Management Strategy, within the Transport Assessment Document Reference 6.3.22.1), environmental considerations and public activities and events.
- 3.6.1.3. Environmental constraints have also been taken into consideration and will be built into the phasing of enabling and construction works for the Converter Station site and Onshore Cable Route, notably;
  - Badger breeding season from June-November, refer to Chapter 16 (Onshore Ecology) for further information and the conditions which will be observed.
  - Plant growing season and winter wet season from August to November, at Kings Pond Meadow SINC and Denmead in Section 3, refer to Chapter 16 (Onshore Ecology) for further information,
  - Wintering bird season, from October and March. Refer to Chapter 16 (Onshore Ecology) for further information on wintering birds and the conditions which will be observed.

#### Table 3.2 - Indicative onshore cable installation programme

Indicative Activity	Indicative Programme
Converter Station Construction	Q3 2021 – Q1 2024
Onshore HVDC Route Construction	Q3 2021 – Q4 2022
Landfall Construction	Q3 2021 – Q4 2023
Onshore HVDC Cable Installation	Q4 2022 – Q3 2023
Converter Station Commissioning	Q4 2023 – Q2 2024



## 4. ENVIRONMENTAL BASELINE

# (MARINE)

## 4.1. INTRODUCTION

4.1.1.1. The following sections provide an overview of the baseline environment relevant to the assessment of the effects of the Proposed Development on European sites and European offshore marine sites. This information is provided here in order to provide a basis for the assessment presented in Sections 5 and 6.

## 4.2. MARINE ENVIRONMENT

#### 4.2.1. STUDY AREAS

- 4.2.1.1. The Proposed Development includes both the cable Landfall and the Marine Cable Corridor.
- 4.2.1.2. The 'Landfall' is defined as the HDD entry/exit location off the coast of Eastney, where cables will travel under the intertidal area (inshore from the HDD marine entry/exit point), and the Marine Cables come ashore above MHWS. The Landfall also includes the section of HDD works that crosses underneath the north-west corner of Langstone Harbour (although this section is exempt from requiring a marine licence).
- 4.2.1.3. The Marine Cable Corridor extends from MHWS at Eastney, out to the UK/France EEZ Boundary Line.
- 4.2.1.4. The study area includes the marine area around the Marine Cable Corridor, encompassing the Solent, the sea area around the Isle of Wight and the Southampton coastline as far as the Selsey Bill, with the greatest detail provided within the Marine Cable Corridor and immediate vicinity. Focus is given to SACs located within 10 km of proposed activities, however consideration is also given to SACs designated for benthic habitats within 50 km of activities to establish potential connectivity which also includes sites within French waters. This study area is considered sufficient to encompass the area for potential connectivity with the Proposed Development. The ZOI has been determined based on the outputs of sediment plume dispersion modelling undertaken to assess the plumes of suspended sediment created during sediment disposal operations resulting from sandwave clearance. The maximum extent of the plume is predicted to extend up to 25 km from the Marine Cable Corridor during dredge disposal activities along an east-west axis. Figures 4-1 and 4-2 illustrate the sites considered for Annex I habitats and Section 6 of this report provides further detail on how sites were identified for assessment in relation to the ZOI.

AQUIND

4.2.1.5. For mobile features such as fish, marine mammals and marine ornithology, the study areas as shown in Table 4-1. Similar to Annex I habitats, the worst case maximum ZOI of potential effects for mobile features will extend 25 km from the Proposed Development due to indirect effects from suspended sediments, however, it should be noted that not all effects assessed will have ZOIs that extend this far.

Feature Group	Study Area	Justification
Fish (see Figures 4-3 and 4-4)	The Channel including the UK and French marine areas and the rivers that flow into the Channel.	International Council for Exploration at Sea ('ICES') rectangles within the central to eastern channel. Relevant ICES rectangles are shown in Plate 4.1. It is considered that the Proposed Development has potential connectivity with a number of sites as it lies within the migratory range of fish features. Figures 4-3 and 4-4. illustrate the sites considered and Section 6 of this report provides further details on those sites and the potential effects to migratory fish features.
Marine mammals (see Figures 4-5 and 4-6)	The eastern Channel including the UK and French marine areas	As marine mammals range widely, animals using the UK's eastern Channel region are also likely to use French waters including those which are encompassed by French SACs. It is considered that the potential for connectivity of sites to the Proposed Development is based on the foraging range of seals or likely population range of cetaceans that are features of these sites. Figures 4-5 and 4-6. illustrate the sites considered and Section 6 of this report provides further details on connectivity.
Marine ornithology (see Figures 4-7 and 4- 8)	Breeding colonies. The study area for breeding seabirds is defined by their mean-maximum foraging range (Thaxter <i>et al.</i> , 2012; additional tracking data where this	It is considered that the potential for connectivity of sites to the Proposed Development is based on the mean- maximum foraging range of breeding seabirds that are features of these sites. Figures 4-7 and 4-8. illustrate the sites considered and Section 6 of this report provides further details on connectivity to those sites.

## Table 4.1 - Study areas for mobile species



Feature Group	Study Area	Justification
	supersedes Thaxter <i>et al.</i> , 2012).	
	Passage and wintering birds. The study area for passage and wintering species is defined by their wintering location and known migratory movements.	It is considered that the potential for connectivity to the Proposed Development is based on the wintering location and migratory movements of features of these sites. Figures 4-7 and 4-8. illustrate the sites considered and Section 6 of this report provides further details on connectivity to those sites.



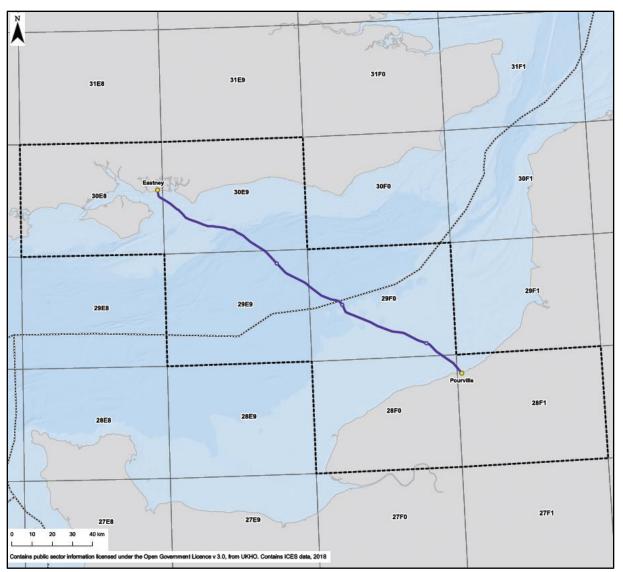


Plate 4.1 - ICES rectangles (bounded by black dotted line) identify the study area for Annex II diadramous migratory fish



## 4.2.2. ANNEX I HABITATS

## Landfall and Intertidal Environment

- 4.2.2.1. The Landfall exhibits coastal vegetated shingle (Irving, 1996; James *et al.* 2010, EMU Ltd, 2012) which is listed as an Annex I habitat under the Habitats Directive (East Solent Coastal Partnership ('ESCP'), 2012) and this area is designated for its coastal vegetated shingle as part of the Eastney Beach Local Wildlife Site (LWS) (Portsmouth City Council ('PCC'), 2014). However, this habitat is located outside of a SAC.
- 4.2.2.2. The lower shore typically consists of ephemeral green and red seaweeds on variable salinity and/or disturbed eulittoral mixed substrata (LR.FLR.Eph.EphX, A2.821).
- 4.2.2.3. The site-specific survey found that the sediment at the Landfall most closely corresponded to was barren or amphipod-dominated mobile sand shores (LS.LSa.MoSa; A2.22).
- 4.2.2.4. Seawalls most closely resembled *Porphyra purpurea* and *Enteromorpha spp*. on sand-scoured mid or lower eulittoral rock (A1.452; LR.FLR.Eph.EntPor), with boulder habitat further down the beach most closely resembled *Fucus spiralis* on sheltered variable salinity upper eulittoral rock (A1.322; LR.LLR.FVS.FspiVS).
- 4.2.2.5. The lower shore community most closely corresponded to the biotope *Laminaria* saccharina with foliose red seaweeds and ascidians on sheltered tide-swept infralittoral rock (A3.224; IR.MIR.KT.LsacT).

#### Marine Cable Corridor

- 4.2.2.6. A site-specific benthic survey (Appendix 8.1 of the ES in Volume 1, document reference 6.3.8.1) identified predominantly sandy habitats in the nearshore (infralittoral fine sand; infralittoral mobile clean sand with sparse fauna; infralittoral mixed sediment) with a small patch of sand ripples in the Solent from 3 stations. The typical community structure is characterised by a range of species including polychaetes, amphipods, bivalves, tunicates, sea anemones and crabs.
- 4.2.2.7. The seabed habitat was ascribed to infralittoral fine sand (A5.23) where the Marine Cable Corridor overlaps with the Solent Maritime SAC. The nearest benthic grab sampling station (Station 1) located 0.3 km from the SAC boundary was identified as resembling infralittoral mixed sediments (A5.43). Station 2 (0.75 km from the SAC boundary, 1 km from the overlap area) was identified as resembling infralittoral mobile clean sand with sparse fauna (A5.231). Compared to published sources, EMODnet predictive habitat maps (EMODnet, 2016) show the sediment composition within the nearshore as predominantly high energy infralittoral sand (SS.SSa.IFiSa or SS.SSa.IMuSa; A5.23 or A5.24) and high energy circalittoral coarse sediment (SS.SCS.CCS; A5.14), high energy circalittoral sand (SS.SSa.CFiSa or



SS.SSa.CMuSa; A5.25 or A5.26) and infralittoral/circalittoral sandy mud (SS.SMu.ISaMu, A5.33; SS.SMu.CSaMu, A5.35).

- 4.2.2.8. Outside of the nearshore area, the most widespread infaunal biotopes according to the benthic survey are offshore circalittoral coarse sediment (SS.SCS.OCS) and *Mediomastus fragilis, Lumbrineris spp.* and venerid bivalves in circalittoral coarse sand or gravel (SS.SCS.CCS.MedLumVen). The geophysical survey data for the area defined several outcrops of hardground intermittently covered by sediment of depths ranging from 5 m to 16 m. Boulder fields are common near to sampling station 21. Although epibenthic communities across the benthic survey area are generally sparse, elevated levels of silt at sampling station 22 have altered the habitat to a mixed substratum occupied by the brittlestars *Ophiothrix fragilis* and/or *Ophiocomina nigra*.
- 4.2.2.9. According to the literature, the UK South Coast region has been classified as large expanses of rock and thin sediment (EMU Ltd., 2012). Sediments within the deeper areas of the Marine Cable Corridor are predicted to be predominantly circalittoral coarse sediment (SS.SCS.CCS; A5.14) and offshore circalittoral coarse sediment (SS.SCS.OCS; A5.15), which is consistent with site specific survey data. Patches of circalittoral sand (SS.SSa.CFiSa or SS.SSa.CMuSa; A5.25 or A5.26), (offshore) circalittoral rock and other hard substrata (CR; A4), infralittoral coarse sediment (LS.LCS; A5.13) and infralittoral sand (SS.SSa.IFiSa or SS.SSa.IMuSa; A5.23 or A5.24) are also expected within the Marine Cable Corridor (EMODnet, 2016).
- 4.2.2.10. Additional habitats predicted within 20 km of the Marine Cable Corridor include infralittoral rock (IR; A3.1, A3.2, A3.3), deep circalittoral sand (SS.SSa.OSa; A5.27), sandy mud (SS.SMu.ISaMu, A5.33; SS.SMu.CSaMu, A5.35), fine mud (SS.SMu.IFiMu, A5.34; SS.SMu.CFiMu, A5.36) and mixed sediments (SS.SMx.IMx, A5.43; SS.SMx.CMx, A5.44; A5.45, SS.SMx.OMx) (EMODnet, 2016).
- 4.2.2.11. Patches of *Sabellaria spinulosa* was the most common species identified in grab samples at sampling stations 5 and 7, although it was not found in amounts required to correlate with any *Sabellaria* biotopes and no reef or encrusting formations were observed.
- 4.2.2.12. The biotope *Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment (SS.SMx.CMx.OphMx) was attributed to Station 22 and considered to have the potential to be representative of Annex I reef with medium resemblance of stony reef, according to Irving (2009), although it is recognised that the area is not within any designated or proposed Marine Conservation Zones ('MCZs') or SAC.
- 4.2.2.13. Rocky outcrops observed in other areas of the Marine Cable Corridor (e.g. sampling stations 7 and 8) were not deemed to be potential Annex I reef as they are poorly colonised and heavily influenced by scour from adjacent coarse sediments.



4.2.2.14. Subtidal sands and gravels (a UK Biodiversity Action Plan ('BAP') priority habitat) were identified across the majority of the benthic survey area.

## Special Areas of Conservation (SACs)

4.2.2.15. The following baseline sets out a summary of the protected sites, and their habitats and species found in the vicinity of the Marine Cable Corridor (see Figures 4-1 and 4-2, document references 6.8.2.4.1 and 6.8.2.4.2).

#### Solent Maritime SAC

- 4.2.2.16. The Solent Maritime SAC covers 113.25 km<sup>2</sup> throughout the Solent (including Langston Harbour and Chichester Harbour) and areas within Southampton Water. The closest section lies immediately east of the Proposed Development, overlapping the Marine Cable Corridor for approximately 163.4 m<sup>2</sup>. However, the Marine Cable Route begins outside of the SAC due to the use of HDD at the Landfall out to between KP 1 and KP 1.6, which exits in the subtidal environment offshore from the SAC (see Section 3.2).
- 4.2.2.17. This Solent Maritime SAC is designated for the following primary features;
  - Estuaries [1130];
  - Spartina swards [1320]; and
  - Atlantic Salt meadows [1330].
- 4.2.2.18. The following Annex I habitats are present as qualifying features but not as a primary reason for selection:
  - Sandbanks which are slightly covered by sea water all the time [1110];
  - Mudflats and sandflats not covered by seawater at low tide [1140];
  - Coastal lagoons [1150] (as a priority feature);
  - Annual vegetation of drift lines [1210]
  - Perennial vegetation of stony banks [1220];
  - Salicornia and other annuals colonising mud and sand [1310]; and
  - Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") [2120].
- 4.2.2.19. In addition, Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016] is present as an Annex II qualifying feature but not a primary reason for site selection, while several intertidal and subtidal habitats are described as subfeatures of primary and qualifying features of the Solent Maritime SAC.



#### South Wight Maritime SAC

4.2.2.20. South Wight Maritime SAC lies 3.3 km west of the Marine Cable Corridor and covers 198.6 km<sup>2</sup>. It is designated for Reefs [1170], Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230] and Submerged or partially submerged sea caves [8330]. Subfeatures include circalittoral rock, infralittoral rock, intertidal rock and subtidal stony reef.

#### Solent and Isle of Wight Lagoons SAC

- 4.2.2.21. Located at a distance of 5 km from the Marine Cable Corridor, Solent and Isle of Wight Lagoons SAC is designated for Coastal Lagoons [1150] as an Annex I habitat as the primary reason.
- 4.2.2.22. The Solent and Isle of Wight Lagoons SAC includes fourteen coastal lagoons, eight in the marshes in the Keyhaven to Lymington area, one in Langstone Harbour and one at Gilkicker, and four at Bembridge on the Isle of Wight (English Nature, 2005; Bamber *et al.*, 2014).

#### Wight-Barfleur Reef SAC

4.2.2.23. The Wight Barfleur Reef SAC is located south of the Isle of Wight approximately 34 km from the Marine Cable Corridor and is designated for Reefs [1170] as the primary reason for site selection.

#### **Studiand to Portland SAC**

4.2.2.24. The Studland to Portland SAC lies approximately 70 km to the west of the Marine Cable Corridor off the south coast of Dorset and is designated for Reefs [1170] as a primary reason for site selection (Natural England, 2018).

## Bassurelle Sandbank SAC/ Ridens et dunes hydrauliques du détroit du Pasde-Calais Zone Spéciale de Conservation (ZSC)

4.2.2.25. Bassurelle Sandbank SAC is designated for Sandbanks which are slightly covered by sea water all the time [1110]. The Bassurelle Sandbank is an open shelf ridge sandbank formed by tidal currents and is located in the Dover Straight on the boundary between UK and French waters, approximately 60 km east of the UK Marine Cable Corridor at its nearest point and covers 62 km<sup>2</sup> at a depth range from 8 m to 140 m (JNCC, 2018a; JNCC, 2017a). The French part of this SAC is called Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC and covers 682.45 km<sup>2</sup>.

#### Littoral Cauchois ZSC

4.2.2.26. An additional SAC located in French waters with close proximity to the Proposed Development is Littoral Cauchois ZSC, however this site is located 52.7 km from the UK Marine Cable Corridor at its nearest point (i.e. the EEZ). It is designated for



several Annex I habitats marine and terrestrial features as a primary reason for site selection. The marine habitats include;

- Reefs (Récifs) [1170],
- Vegetated sea cliffs Vegetated sea cliffs of the Atlantic and Baltic coasts [1230].

4.2.2.27. The site also includes many terrestrial features including:

- Perennial vegetation of stony banks [1220]
- Nutrient-poor shallow waters with aquatic vegetation on sandy plains Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]
- Calcium-rich nutrient-poor lakes, lochs and pools Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140]
- Naturally nutrient-rich lakes or lochs which are often dominated by pondweed Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation [3150]
- Wet heathland with Dorset heath and cross-leaved heath Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix* [4020]
- Dry heaths European dry heaths [4030]
- Purple moor-grass meadows Molinia meadows on calcareous, peaty or clayeysilt-laden soils (*Molinion caeruleae*) [6410]
- Tall herb communities Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- Lowland hay meadows Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]
- Hard-water springs depositing lime Petrifying springs with tufa formation (*Cratoneurion*) [7220]
- Alkaline fens [7230]
- Caves not open to the public [8310]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- Atlantic acidophilous beech forests with llex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) [9120]
- Asperulo-Fagetum beech forests [9130]
- Tilio-Acerion forests of slopes, screes and ravines [9180]
- Old acidophilous oak woods with Quercus robur on sandy plains [9190]



- 4.2.2.28. The site is also designated for Annex II species:
  - Great crested newt *Triturus cristatus* [1166].

#### 4.2.3. ANNEX II DIADRAMOUS MIGRATORY FISH

- 4.2.3.1. The following sets out the baseline for those fish species that are interest features of European designated sites (i.e. SACs).
- 4.2.3.2. Although a large diversity of fish occurs in the Channel only a small number are listed as features of SACs (Annex II species) which also have a marine stage in their lifecycle (see Figures 4-3 and 4-4, document reference 6.8.2.4.3 and 6.8.2.4.4). These species are:
  - Twaite shad (*Alosa fallax*);
  - Allis shad (*Alosa alosa*);
  - Atlantic salmon (Salmo salar);
  - Sea lamprey (*Petromyzon marinus*); and
  - River lamprey (Lampetra fluviatilis).
- 4.2.3.3. Although no fish specific surveys were undertaken for the Proposed Development a thorough literature review of publicly available data such as commercial fisheries landings data (by ICES rectangle and ICES Division data) and surveys from other developments in the Channel has been used to inform this baseline.

#### Allis and Twaite Shad

- 4.2.3.4. Both twaite and allis shad are both members of the herring family (*Clupeidae*) and are the only two members of that family that spawn in freshwater in the UK. Shad generally have a westerly distribution in Europe with major rivers flowing into the Atlantic having the largest populations (Maitland *et al.*, 2003). In the UK spawning populations of twaite shad are known to be present in a small number of rivers in Wales and on the England/Wales border which flow into the Severn estuary these include the rivers Tywi, Usk and Wye (Carstairs, 2000). Although twaite shad are present in other rivers further north, no other spawning stocks are known to exist (Maitland & Lyle, 2001).
- 4.2.3.5. Mature allis shad migrate into freshwater during late spring (April to June) and twaite shad in April and May, and spawning takes place over clean gravel for both species. Most allis shad die after spawning although twaite shad may spawn several times in their lives. After one to two years in freshwater, young shad descend down river to the sea where they remain for between three and eight years before returning to freshwater to spawn (Maitland *et al.*, 2003).
- 4.2.3.6. In the Channel commercial fisheries data (average tonnage 2011 2016) (Marine Management Organisation (MMO), 2017) shows that shad are caught in both the coastal and offshore ICES rectangles (30E9, 30E8, 29F0 and 29E9) and also in ICES



Division VII.7.d confirming they are present in this area (see Plate 4.1). The highest landings by weight are from the inshore rectangles 30E9 and 30E8 (five-year average 0.21 and 0.13 tonnes respectively, (MMO, 2017). It should be noted however that as shad are protected under the Wildlife and Countryside Act, they are prohibited from being specifically targeted within the UK 12 nmi limit and commercial fisheries data may not be reflective of shad numbers.

4.2.3.7. Surveys to inform the Rampion Offshore Wind Farm ('OWF') DCO application, 12 km east of the Proposed Development, confirm the presence of both the allis shad and twaite shad, where one specimen of each species was captured (RSK, 2012).

#### Atlantic Salmon

- 4.2.3.8. The Atlantic salmon (from here on referred to as salmon) is widespread in many parts of the British Isles. This species spawns in freshwater in late autumn where the young salmon remain for 1-3 years before migrating to the marine environment as smolts to feed. After between 1-5 years at sea the mature salmon return to their natal river to spawn.
- 4.2.3.9. Rod catch data for several UK rivers (including the Itchen and Avon) flowing into the Channel show the highest catches to occur between May to September (Environment Agency, 2018). This indicates the period when salmon destined for these catchments are actively migrating into freshwater.
- 4.2.3.10. The downstream migration of smolts generally occurs in the UK during April and May however a specific study undertaken on the River Itchen revealed that some smolts also migrate during autumn (September November inclusive) and as late as January (Ridley *et al.*, 2002).
- 4.2.3.11. During their marine stage salmon migration routes in the Channel are not fully understood however studies in Scottish rivers have shown that salmon migrate to feeding grounds around Greenland and the Faroe Islands (Malcolm *et al.*, 2010). This indicates a general northerly marine migration with some variation from river to river (Malcolm *et al.*, 2010).
- 4.2.3.12. Commercial fisheries data shows that salmon were landed in ICES Division VII.7.d in very low weights (five-year average of 0.01 tonnes). However, given the proximity of a number of rivers on the south coast where salmon are known to be present, they are likely to be in the vicinity of the Proposed Development either as adults and/or smolts.

#### <u>Sea lamprey</u>

4.2.3.13. The sea lamprey is the largest lamprey species in the UK. They are anadromous so live and feed at sea before returning to spawn in the freshwater reaches of rivers. Juvenile lamprey (*ammocoetes*) live in riverine sediment for a number of years before migrating to sea as transformers. Sea lamprey do not have any site fidelity and will spawn in any suitable river.



- 4.2.3.14. The distribution of sea lamprey in the UK is well documented with spawning occurring in rivers on the south east and west coasts of the UK. They are present in much of the Atlantic coastal area of western and northern Europe (Maitland, 2003). Mature sea lamprey enter rivers in early spring and spawn in late May or June in British rivers, with adults dying after spawning. The downstream seaward migration of transformers occurs from late autumn onwards (Scottish Natural Heritage (SNH), 2019).
- 4.2.3.15. Sea lamprey have no commercial importance and are therefore not targeted by commercial fishing practices. As a result, this species is not recorded in any landings data by ICES rectangle or ICES Division. It is considered however that given the proximity of the River Avon, where sea lamprey are known to spawn, they are likely to be in proximity to the Proposed Development at certain times of year.

#### River lamprey

- 4.2.3.16. The river lamprey, although smaller in size, shares similar life cycle characteristics to the sea lamprey. It spawns in the freshwater reaches of rivers during March and April with the ammocoetes living in the sediment for a number of years before migrating back to sea. The young lamprey do not share the oceanic migrations of the sea lamprey but remain mostly in estuarine and coastal environments for several years before returning to freshwater to spawn.
- 4.2.3.17. The distribution of this species is widespread with river lamprey ammocoetes occurring in many rivers from the Great Glen in northern Scotland southwards (Maitland, 2003).
- 4.2.3.18. There is no landings data available for river lamprey as they are not targeted commercially at sea. However, due to their wide distribution around the UK and proximity of a number of rivers to the Proposed Development they are likely to be in the coastal regions of the Channel at certain times of the year.

#### 4.2.4. MARINE MAMMALS

- 4.2.4.1. Due to the mobile nature of marine mammal species, the study area is considered to be the entire eastern Channel region from MHWS out to the UK/French EEZ Boundary Line. However, because marine mammals range widely, animals using the study area are also likely to use French waters including those which are encompassed by French SACs (known as ZSCs in France; see Figures 4-5 and 4-6, document references 6.8.2.4.5 and 6.8.2.4.6).
- 4.2.4.2. A variety of marine mammal work has been done in the Channel including line transect survey (cetaceans) and telemetry work (seals). These data sources were examined but no project-specific marine mammal surveys were conducted. The key references for the main data sources are shown in Table 4-2 below.
- 4.2.4.3. The marine mammal fauna of the eastern Channel is poor, both in diversity of species and numbers of animals, compared to other parts of the UK. Information on the main



species which occur in the study area (harbour porpoise, bottlenose dolphin, grey seal and harbour seal) has been summarised in Table 4-2 and is considered to be sufficient to identify the species for which SACs need to be considered and conduct an assessment of LSE given the nature of the Proposed Development and the fact that species occurrence in the Channel is unlikely to change in the short to medium term.

4.2.4.4. A local estimate of species density is available for just one of the four main species which occur in the area – harbour porpoise (0.213 animals per km<sup>2</sup>; Hammond *et al.*, 2017). This estimate, for the Channel survey block, is low compared to those for neighbouring survey blocks in the southern North Sea where density estimates range from 0.607 to 0.888 animals per km<sup>2</sup> (Hammond *et al.*, 2017).

Table 4.2 - Summary of information on the main marine mammal species which occur
in the eastern Channel

Species	Occurrence	Distribution	Key references
Harbour porpoise ( <i>Phocoena</i> <i>phocoena</i> )	Present year round	Widespread	Evans (2006) Hammond <i>et al.</i> (2017)
Bottlenose dolphin ( <i>Tursiops truncatus</i> )	Observed most commonly during summer (July- September)	Primarily an inshore species with most sightings within 10 km of land but can also occur offshore	Jones <i>et al.</i> (2004) McClellan <i>et al.</i> (2014) Pettex <i>et al.</i> (2014)
Grey seal (Halichoerus grypus)	Present year round	Widespread	Chesworth <i>et al.</i> (2010) Russell <i>et al.</i>
Harbour seal ( <i>Phoca vitulina</i> )	Present year round	Mainly coastal	(2017) Vincent <i>et al.</i> (2017)

#### 4.2.5. MARINE ORNITHOLOGY

- 4.2.5.1. This section sets out the baseline for those designated marine ornithological features which are present seaward of MLWS. A description of the baseline for ornithological features present inland of MLWS (e.g. terrestrial and intertidal features) is presented in Section 5 of this report.
- 4.2.5.2. Given the nature and scale of the Proposed Development, site-specific surveys for marine ornithology were not undertaken following the proportionate approach advocated by Chartered Institute for Ecology and Environmental Management (CIEEM) (2019). Instead, information on aspects of seabird and inshore waterbird



presence and ecology was collated from the literature to inform the baseline environment.

- 4.2.5.3. The overall abundance of seabirds and inshore waterbirds in UK waters within the Channel is relatively low (Bradbury *et al.*, 2014; Wakefield *et al.*, 2017), with numbers not reaching the necessary thresholds to qualify for marine SPA designation under the Birds Directive (Kober *et al.*, 2010, 2012) (also see Figures 4-7 and 4-8, document references 6.8.2.4.7 and 6.8.2.4.8).
- 4.2.5.4. However, species diversity is high, and the Channel is an important area during migration (Steinen *et al.*, 2007). Furthermore, whilst there is little suitable habitat for cliff-nesting seabirds, there are a number of internationally important tern and gull colonies present on the sand and shingle beaches, saltmarshes and offshore islets of the southern English coastline.
- 4.2.5.5. Table 4-3 provides a summary of the marine ornithological baseline as detailed in Chapter 11 Marine Ornithology of the ES for the Proposed Development.

#### Table 4.3 - Summary of the marine ornithology baseline

,	
Feature	Abundance and Distribution in the Study Area
Common scoter; and Eider	Barne <i>et al.</i> , (1998) state that common scoters are most abundant off Rye Harbour during the winter, approximately 90 James <i>et al.</i> , (2010) state that only a small number of seaduck observations were recorded during aerial surveys overlapped with the Proposed Development, although these species may have been underestimated during surveys. the Rampion OWF, to the east of the Proposed Development, recorded a peak of 73 common scoters during boa surveys (RSK, 2012). Navitus Bay Wind Park (which had its DCO application rejected in 2015), situated to the west of that <i>c</i> .1,600 common scoters passed through the Channel during spring and autumn migration, with a significant easte 2012a; Navitus Bay Wind Park, 2014). Common eiders are also present in low abundance all along the southern E harbours and estuaries (Royal Society for the Protection of Birds ('RSPB'), 2009). Frost <i>et al.</i> , (2018) report a five Chichester Harbour in October (2012/13-2016/17).
Great northern diver; Black-throated diver; and Red-throated diver	Great northern diver, black-throated diver and red-throated diver all occur in inshore waters of the Channel during the w (WWT, 2013). James <i>et al.</i> , (2010) report that the majority of diver records recorded during aerial surveys across the >50 km to the east of the Proposed Development. Relatively low numbers were recorded during these surveys, w recorded during summer 2008. Low numbers of diver species were also recorded during baseline surveys undertake red-throated divers was recorded during boat-based surveys undertaken for the Rampion OWF in 2010-12, with seve 2012). At Navitus Bay Wind Park, a single black-throated diver was recorded during a boat-based survey in December
Great crested grebe; Black-necked grebe; Red-necked grebe; and Slavonian grebe	Grebe species are also present in inshore waters of the Channel during the non-breeding season (Barne <i>et al.</i> , 1996 wintering population of Slavonian grebe which utilises the Sussex coast, with nationally important numbers wintering Proposed Development (20-25 individuals; Barne <i>et al.</i> , 1998). There are also known black-necked grebe wintering Harbour (Barne <i>et al.</i> , 1996; RSPB, 2009), in the vicinity of the Landfall. Neither RSK (2012) nor Navitus Bay Wine having been recorded during baseline surveys, reflecting the species' inshore distribution.
Red-breasted merganser	Important numbers of red-breasted merganser are known to winter at Chichester, Langstone and Portsmouth Harbour (2018) state that a five year mean peak of 87 red-breasted merganser (2012/13-2016/17) has been present at P Langstone Harbours, a five year mean peak of 163 and 228 birds were recorded, respectively (2012/13-2016/17) recorded during baseline surveys at Navitus Bay Wind Park; one in April 2011 and one in November 2011 (Navitus Ba at Rampion OWF (RSK, 2012), again reflecting the more inshore habitat preferences of this species.
Fulmar; Manx shearwater; Balearic shearwater; and Storm petrel	Three of these pelagic species were recorded during aerial surveys of the south coast region in 2007 and 2008 (James and storm petrel. Baseline surveys undertaken for Navitus Bay Wind Park and Rampion OWF also reported low nu through the region during migration (e.g. a peak of four birds during autumn at Navitus Bay; Navitus Bay Wind Park, the southern English coastline year-round, with a high concentration observed to the east of Portsmouth and the 2010). Numerous fulmar nesting sites are present along the coastline in the region, with important numbers breeding >50 km from the Proposed Development (WWT, 2009). Breeding fulmar are also present along the French coastline Normandy (Le Guillou & Debout, 2012), located c.54 km from the Proposed Development. Furthermore, there is Alderney within foraging range of the Proposed Development (D. Clifford 2019, pers. comm.). Both Manx shearwa further north, passing through the Channel during migration. Storm petrel also breeding on Alderney, c.142 km from some birds are also present within the Channel during the breeding season.
Gannet	Gannet are present in the Channel year-round (WWT, 2013). Baseline surveys undertaken for Navitus Bay Wind Pa most frequently recorded species during baseline surveys, with the highest numbers recorded during the breeding s which is consistent with other surveys (e.g. James <i>et al.</i> , 2010; RSK, 2012). Pettex <i>et al.</i> , (2014, 2017) also identified la



0 km east of the Proposed Development. /s undertaken in 2007 and 2008 which s. Surveys undertaken more recently for pat-based surveys, and 210 using aerial of the Proposed Development, estimated rerly movement in April (Natural England, English coastline in winter, including in /e year mean peak of two individuals in

winter, albeit in relatively low abundance he south coast region were off Brighton, with 171 noted in winter and two birds aken for proposed OWFs. A peak of 91 ven recorded during aerial surveys (RSK, per 2009 (Navitus Bay Wind Park, 2014).

96; 1998). In particular, there is an overg in Pagham Harbour, *c*.9.5 km from the g sites in Langstone Harbour and Poole nd Park (2014) report grebe species as

purs (Natural England, 2019). Frost *et al.*, Portsmouth Harbour. In Chichester and 7). Two red-breasted mergansers were bay Wind Park, 2014), with none reported

es *et al.*, 2010): fulmar, Manx shearwater numbers of Balearic shearwater passing (, 2014). Fulmar have been observed off e Proposed Development (James *et al.*, ng between Brighton and Beachy Head, line with important numbers breeding in is also a breeding fulmar population on vater and storm petrel breed at colonies om the Proposed Development and thus

Park found that gannet was one of those season (Navitus Bay Wind Park, 2014), large numbers of gannets in the eastern

WSP/Natural Power

Feature	Abundance and Distribution in the Study Area
	Channel during winter, particularly in the Strait of Dover to the east of the Proposed Development. Most gannets record for OWFs in the region recorded gannets in flight (RSK, 2012; Navitus Bay Wind Park, 2014). This is to be expected foraging species (Snow & Perrins, 1998). Multi-colony tracking data show that breeding adult gannets present in the are most likely to originate from the colony at Les Etacs and Ortac, Alderney, rather than the colony on île Rouzic off E <i>et al.</i> , 2013; Warwick-Evans <i>et al.</i> , 2016; D. Clifford 2019, pers. comm.).
Shag; and Cormorant	Cormorants are known to breed at two locations within along the southern English coast in proximity to the Propose western tip of the Isle of Wight, and at Studland Cliffs along the Purbeck Coast, west of the Proposed Development Small numbers of shag also breed along the Purbeck Coast (Lake <i>et al.</i> , 2011) but are otherwise largely absent the Harbours are both important wintering sites for cormorant (Barne <i>et al.</i> , 1996) with Frost <i>et al.</i> , (2018) reporting a five Portsmouth Harbour, with the highest numbers recorded in October. Low densities of both cormorants (0.01-0.09 bird were recorded by Stone <i>et al.</i> , (1995) in coastal areas to the west of the Isle of Wight around Poole Harbour and aro year. Rampion OWF recorded a peak of seven cormorants across its baseline survey campaign (RSK, 2012), whi single cormorant during a boat-based survey in November 2011, and no shags (Navitus Bay Wind Park, 2014).
Great skua; Arctic skua; and Pomarine skua	James <i>et al.</i> , (2010) report that limited numbers of skuas were recorded during aerial survey campaigns in 2007-20 aerial surveys conducted across the Channel as part of the Suivi Aérien de la Mégafaune ('SAMM') campaigns she skua was highest closer to the French coastline as well the south-western tip of the UK off the Cornish coast (Pettex e undertaken for Rampion OWF in 2010-2012 recorded 148 great skuas, 53 pomarine skuas and 10 Arctic skuas passing 1,114 Arctic skuas and 713 great skuas were considered to pass through the Navitus Bay Wind Park during spring a migration modelling tool (Navitus Bay Wind Park, 2014).
Sandwich tern; Arctic tern; Common tern; Roseate tern; and Little tern	Sandwich terns, common terns, roseate terns and little terns are present on the southern coast of England from April to beaches, saltmarshes and offshore islets (James <i>et al.</i> , 2010). Breeding colonies in the vicinity of the Proposed De Langstone, Pagham and Newtown Harbours, and at North Solent, Hurst Point to Pitts Deep and Lymington to Pylewell 2019). Arctic terns breed at colonies further north but pass through the Channel during migration in the spring and a <i>et al.</i> , (2010) report a total of 358 tern observations from aerial surveys undertaken in summer 2008. Tern records pea surveys undertaken for Rampion OWF (RSK, 2012), with Sandwich terns (n=40), Arctic terns (n=180) and common level, and a further 2,287 terns recorded as 'Arctic/common'. No roseate terns were recorded which may reflect their region compared to other tern species. The lack of little tern records may reflect their inshore feeding distribution (v km; Thaxter <i>et al.</i> , 2012).
Herring gull; Great black-backed gull; Lesser black-backed gull and Yellow-legged gull	Gulls were the most abundant and widely distributed seabird group recorded across the south coast region during as with 14,835 individuals recorded during winter and 6,294 recorded during the summer (James <i>et al.</i> , 2010). More rec Rampion OWF recorded a total of 34,551 gulls across all surveys. Of those large gulls identified to species level, her 2012). There are no major cliff-based gull colonies in the vicinity of the Proposed Development (Stroud <i>et al.</i> , 1990), wat the cliffs between Brighton and Newhaven (WWT, 2009). However, there are an increasing number of roof-nesting gulls in Dorset and Hampshire (Nager & O'Hanlon, 2016). Many large gull species are present year-round in the Indeed, within Portsmouth Harbour, Frost <i>et al.</i> , (2018) report five-year winter mean peaks for lesser-black-backed black-backed gull (30). Small numbers of yellow-legged gull have been recorded during baseline surveys for Ramp during the non-breeding season (RSK, 2012; Navitus Bay Wind Park, 2014), with a known breeding site located at Park
Kittiwake; Mediterranean gull;	As with the large gulls, many small gull species are present in the Channel year-round in the vicinity of the Propose such as little gull and kittiwake, numbers increase during the winter as birds breeding at more northerly colonies move <i>et al.</i> , (2018) report five-year winter mean peaks for black-headed gull (2,431) and common gull (192) within Portsmou



rded during baseline surveys undertaken ed as gannets are a wide-ranging aerial ne vicinity of the Proposed Development F Brittany (Soanes *et al.*, 2012; Wakefield

sed Development: at the Needles on the at (Barne *et al.*, 1996; Lake *et al.*, 2011). t from the region. Langstone and Poole ive-year mean peak of 66 cormorants in rds/km<sup>2</sup>) and shags (0.01-0.49 birds/km<sup>2</sup>) round the Solent throughout much of the hilst Navitus Bay Wind Park recorded a

2008 across south coast region. Indeed, howed that the encounter rate for great *c et al.*, 2014, 2017). Boat-based surveys ng through the survey area. An estimated and autumn, based on the outputs of a

to August, breeding on sand and shingle Development are present at Chichester, ell (Mitchell *et al.*, 2004; Natural England, autumn (Wernham *et al.*, 2002). James eaked in May during baseline boat-based on terns (n=172) all recorded to species ir relatively low breeding numbers in the (with a mean-max foraging range of 6.3

aerial surveys undertaken in 2007-2008, ecent boat-based surveys undertaken for erring gull was the most abundant (RSK, with the nearest breeding colony located ng lesser-black-backed gulls and herring e vicinity of the Proposed Development. d gull (five), herring gull (170) and great npion OWF and Navitus Bay Wind Park Poole Harbour.

sed Development. However, for species re southwards (Pettex *et al.*, 2017). Frost buth Harbour. Mediterranean gulls breed

WSP/Natural Power

Feature	Abundance and Distribution in the Study Area
Common gull;	in important numbers at Newtown Harbour, North Solent and between Hurst and Lymington, with breeding black-head (Natural England, 2019).
Black-headed gull; and	
Little gull	
Guillemot;	The south coast of England has relatively few cliff-based colonies of auks due to a lack of suitable habitat. However, s
Razorbill; and	and puffins breed along the Purbeck Cliffs, c. 60 km west of the Proposed Development (Barne et al., 1996; Lake et that the south coast region represents a more significant resource for auks during the winter months, with relatively
Puffin	year (RSK, 2012; Navitus Bay Wind Park, 2014; Pettex <i>et al.</i> , 2017). Of the three auk species present in the region, g of guillemots peaked in late spring during baseline surveys for Navitus Bay Wind Park and Rampion OWF as birds m more northerly breeding colonies (Navitus Bay Wind Park, 2014).



aded gulls also present at these colonies

r, small numbers of guillemots, razorbills e *et al.*, 2011). James *et al.*, (2010) notes ely high number observed at this time of a, guillemot are most abundant. Numbers s moved through the area on passage to

WSP/Natural Power



# 5. ENVIRONMENTAL BASELINE

# (ONSHORE)

## 5.1. ONSHORE ENVIRONMENT

## 5.1.1. STUDY AREA

- 5.1.1.1. The study area for the Proposed Development onshore principally includes the Converter Station Area, the Onshore Cable Corridor and the Landfall. To aid design development and environmental assessment the Onshore Cable Corridor has been divided into ten sections. These can be summarised as follows:
  - Section 1 The Converter Station Area The northern section of the Proposed Development comprising the Access Road, Telecommunications Buildings, security fencing, temporary construction compound, car park and laydown areas;
  - Sections 2 9 The Onshore Cable Corridor The Onshore Cable Corridor from the Converter Station Area at Lovedean to the Landfall at Eastney (approximately 20 km); and
  - Section 10 Landfall The Landfall area including the two Optical Regeneration Stations "ORS", construction of underground infrastructure, temporary vehicular routes for construction vehicles, temporary construction compound, car park and laydown areas and construction vehicle movements.
- 5.1.1.2. The Landfall is defined as the HDD entry/exit location off the coast of Eastney, where cables will travel under the intertidal area, and the marine cables come ashore above MHWS.
- 5.1.1.3. The study area includes the onshore and intertidal areas adjacent to the Order limits of the Proposed Development onshore, with all European sites within 10 km considered (Plate 5.1 and 5.2).



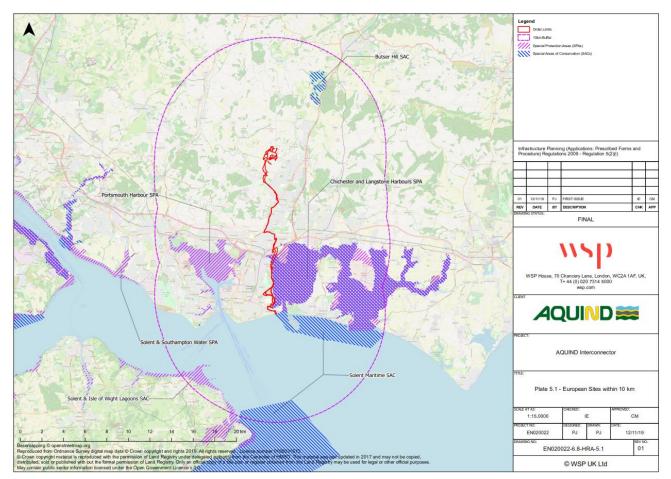
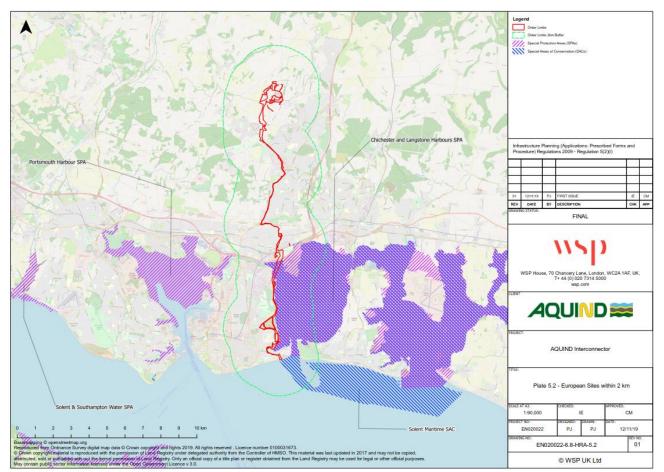


Plate 5.1 – European Sites within 10 km

WSP/Natural Power





## Plate 5.2 – European Sites within 2 km

#### 5.1.2. HABITATS

## **Converter Station Area**

5.1.2.1. The Converter Station Area is located within agricultural land on the edge of the village of Lovedean, Hampshire. The area is mainly composed of arable land (poor semi-improved grassland, semi-improved neutral grassland) with hedgerows and small pockets of woodland, including ancient woodland, and residential development to the south-east. Habitats present in the Converter Station Area include Semi-natural broadleaved and plantation woodland, semi-improved neutral and improved grasslsnd, arable and hedgerows. Full details of these habitats are described in the Preliminary Ecological Appraisal (ES Technical Appendix 16.2).

#### Onshore Cable Corridor

5.1.2.2. The Onshore Cable Corridor largely passes urban areas of Portsmouth, Drayton, Purbrook and Waterlooville and is divided into eight sections (2-9). Scattered trees are present along the Onshore Cable Corridor, as are hedgerows. Habitats in the Onshore Cable Corridor include semi-natural broadleaved woodland, scattered scrub and trees, semi-improved grassland, arable and built-up areas. These habitats are fully described in the Preliminary Ecological Appraisal (ES Technical Appendix 16.2).

AQUIND

### Eastney Landfall

- 5.1.2.3. The Landfall is located in the car park south of Fort Cumberland Road, adjacent to the Land West of Fort Cumberland SINC. Fort Cumberland SINC and Scheduled Ancient Monument are located further east. The area also incorporates a section of Eastney Beach, a designated SINC. The Eastney Beach SINC exhibits coastal vegetated shingle which is listed as an Annex I habitat under the Habitats Directive and this area is designated for its coastal vegetated shingle as part of the Eastney Beach LWS (Portsmouth City Council, 2014). This is however located outside of a SAC. The baseline environment regarding habitats in the intertidal zone is fully explored under Marine Environment in Section 4.2.
- 5.1.2.4. Land West of Fort Cumberland SINC includes with habitats comprising semiimproved grassland, coastal heathland and scrub habitats. Eastney Beach SINC is situated to the south which comprises sand/shingle beach with concrete erosion protection and a mosaic of habitats resulting from derelict developments on the landward side; disused buildings, scrub, rough grassland and bare ground.
- 5.1.2.5. Onshore habitat present in the landfall consists of hardstanding with adjacent scrub, semi-improved and amenity grassland. These habitats are fully described in Preliminary Ecological Appraisal (ES Technical Appendix 16.2).

#### 5.1.3. SPECIES

- 5.1.3.1. A number of onshore Project-specific ecological surveys have been undertaken in order to inform the DCO Application. These include the following that had the potential to be relevant to HRA:
  - ES Technical Appendix 16.2 Preliminary Ecological Appraisal comprising a desk study of information obtained from key sources (including on European sites) and an Extended Phase 1 Habitat Survey (JNCC, 2010, CIEEM, 2016);
- 5.1.3.2. Surveys undertaken for both breeding and wintering birds are detailed separately below. Further surveys undertaken that are not considered to have any potential relevance to HRA include those for aquatic (freshwater) ecology, great crested newts, reptiles, badger and dormouse. These features while considered in Chapter 16: Onshore Ecology of the ES do not relate to features of any European Site within the vicinity of the Proposed Development and are therefore not considered in this HRA.

#### 5.1.4. ORNITHOLOGY

5.1.4.1. This section sets out the baseline for those designated ornithological features which are present inland of Mean Low Water Springs (MLWS). A description of the baseline for marine ornithological features seaward of MLWS is presented in Section 4.2.5.

## Landfall and Intertidal Environment

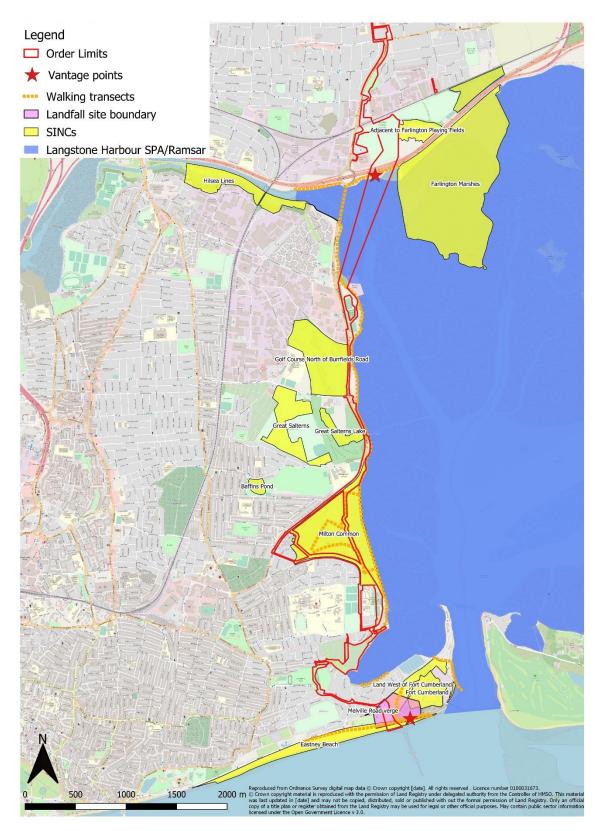
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- 5.1.4.2. Surveys during winter and breeding periods on the intertidal habitat adjacent to the Landfall and Onshore Cable Corridor (at Langstone Harbour) were undertaken (ES Technical Appendices 16.12 and 16.13).
- 5.1.4.3. Breeding bird surveys were implemented through a vantage-point methodology to target any nesting or foraging locations for little tern, common tern and sandwich tern (qualifying features of Chichester and Langstone Harbours SPA). The surveyors undertook surveys of 10 minutes in duration with the use of a telescope and binoculars. No tern species were found to be breeding within the Survey Area.
- 5.1.4.4. To determine the composition of the wintering bird community in and around Chichester and Langstone Harbour SPA, six monthly survey visits were completed between October 2017 and March 2018 (Plate 5.3). These surveys followed prescribed methodology gived by the British Trust for Ornithology (2010) and Bibby et al., (2000).
- 5.1.4.5. Two different survey types at intertidal habitats were undertaken as described in Table 5.1.

Survey Type	Description
Intertidal survey	This survey methodology used was an adapted version of the standard BTO's Wetland Bird Survey (WeBS) (BTO, 2010), incorporating the direct counts methodology (Bibby et al., 2000). It involved two surveyors walking the western perimeter of the Chichester and Langstone Harbours SPA from Farlington Marshes to Fort Cumberland, the SPA's closest point to the cable route. Surveyors made frequent stops at suitable places to count birds seen and to record their location, taking notes of their behaviour (foraging, loafing, sleeping, preening etc). The survey area was defined applying a 500 m buffer from the Order Limits. The survey was undertaken twice per visit, once at low tide and once at high tide, in order to determine species usage depending on tidal cycle (i.e. foraging areas during low tide, roosts during high tide). The surveys were undertaken monthly between October 2017 and March 2018.
Vantage points at low and high tides	In addition to the above, surveyors spent one hour around high tide and low tide in two locations during the the monthly visits, one in the north of the estuary at Farlington Marshes (467786, 104341) and another in the south at Eastney Beach (468108, 98993) counting birds flying over these sites. Surveyors recorded the species, flight direction and number of individuals that passed. The aim was describing the exchange of birds between the Site and the surrounding.

## Table 5.1 - Methods used during wintering bird surveys in intertidal habitat





### Plate 5.3 – Onshore wintering bird survey locations

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5.1.4.6. Forty-five species of bird were identified during intertidal surveys. Peak counts (the highest number of observations of SPA qualifying species encountered on an individual survey visit) at low and high tide are shown in Table 5-2.

- 5.1.4.7. Peak counts highlight differences in the abundance of bird species across the whole survey area, and identify those species which are dominant in the winter bird community, separating them from those which are represented only by small numbers or by single birds. The data show there are two highly abundant species that are features of the SPA (dark-bellied brent goose and dunlin), with numbers of observations significantly greater than the remaining species.
- 5.1.4.8. At low tide birds used the survey area to feed, foraging on the intertidal mudflats exposed by receding water for prey living in the mud and amongst small patches of rocky ground. As the tide came in, most species were observed leaving the survey area to find protection in high tide roosts elsewhere in the local area. Counts of birds were lower at high tide than at low tide for this reason (some species, e.g. dunlin and black-tailed godwit) were only observed at low tide and vacated the area completely during high tide), and few if any high tide roosts were observed. This is likely a function of the man-made seawalls that border Chichester and Langstone Harbour along its western side and the high levels of disturbance along the seawall, it having a popular pedestrian footpath used by the public for leisure, dog walking and running/fitness pursuits. However, some species more tolerant of disturbance and also that forage on more rocky substrates were more abundant at high tide. Sanderling, turnstone and redshank fell into this category, all being more abundant along the western side of the harbour during high tide.
- 5.1.4.9. Although low-tide is key for many species, both tide phases support foraging intertidal birds and there are few high tide roosting opportunities along the western side of the estuary. Results are discussed belowon species that are qualifying features of Chichester and Langstone Harbours SPA.

#### Dark-bellied Brent Goose

5.1.4.10. This was the most abundant species recorded during survey, and an important winter visitor as over 1% of the world population of the dark-bellied subspecies (*Branta bernicla bernicla*)<sup>4</sup>. This species overwinters in the Solent area with Chichester and Langstone Harbour being a favoured site. Geese were observed foraging on mudflats at low-tide, loafing in large groups on the water at high tide, and at both tides flying to/from and foraging terrestrial foraging sites. The number of observations of this species is inflated by its high mobility, with birds frequently flying to and from the harbour causing repeated counting of the same birds. However, using intertidal counts and counts from Solent Wader and Brent Goose Strategy Sites (see below) it is possible to safely conclude several thousand individual brent geese use the

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<sup>&</sup>lt;sup>4</sup> Carboneras, C., Christie, D.A. & Kirwan, G.M. (2018). Brent Goose (*Branta bernicla*). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D.A. & de Juana, E. (eds.). Handbook of the Birds of the World Alive. Lynx Edicions, Barcelona.



intertidal survey area. Brent goose is a Bird of Conservation Concern (BoCC; Eaton et al., 2015) Amber listed species and one of the qualifying features of the Chichester and Langstone Harbours SPA.

#### Shelduck

5.1.4.11. Shelduck was relatively abundant during the surveys with peak countsof of 45 and 66 and 60 individuals at high and low tide respectively. Shelduck were distributed throughout the intertidal survey area.

#### Pintail

5.1.4.12. Pintail were also relatively abundant during the surveys although they were only present in smaller numbers until February 2018. Pintail were mostly observed at low tide and a peak count of 75 individuals occurred in February 2018. Pintail localised in their distribution to the area around the A2030 bridge and Farlington Marshes in the north of the survey area.

#### Shoveler

5.1.4.13. Shoveler were recorded on a single survey only, where two indiduals occurred during low tide in December 2017.

#### **Red-breasted Merganser**

5.1.4.14. Red-breasted merganser were recorded sporadically during the surveeys in low numbers. The peak count of 12 individuals occurred during high tide in November 2017. As this species is a diving duck few individuals were redorded at low tide when the survey area is dominated by intertidal mud.

#### Teal

5.1.4.15. Teal were consistenty recorded during surveys at both high and low tide with peak counts of 33 (high tide Decdember 2017) and 50 (low ide February 2018) respectively. Teal occurred in both intertidal areas in addition to waterbodies within Milton Common.

#### **Grey Plover**

5.1.4.16. Grey plover generally occurred only at low tide during the surveys (peak count of 19 in January 2018), with only one sighting at high tide. This species was restricted to intertidal mud habitat mainly in the south of the survey area.

#### **Ringed Plover**

5.1.4.17. Ringed plover was moderately common during the surveys (peak counts of 38 at low tide February 2018 and 58 at high tide October 2017), and was able to feed on open mudflats at low tide and close to the harbour wall amongst shingle at high tide.

#### Dunlin

5.1.4.18. A highly abundant small wader with peak counts of 2,000 birds within the intertidal survey area at low tide; however, this species almost completely vacates mudflats within the survey area at high tide to roost elsewhere. The intertidal survey area is clearly an important foraging area for this species in winter. Dunlin is BoCC Amber



listed and one of the qualifying features of the Chichester and Langstone Harbours SPA.

#### Sanderling

5.1.4.19. Sanderling were found in small numbers during he surveys except March 2018 when 200 were recoded during high tide. All records were at Eastney Beach with no indviduals recorded using the intertidal mud in Lagstone Harbour.

#### **Bar-tailed Godwit**

5.1.4.20. Bar-tailed godwit records were restricted to a single individual during low tide in January 2018.

#### Curlew

5.1.4.21. Curlew were common at low tide during the surveys (low tide peak count of 61 individuals in February 2018) with very few sightings at high tide (peak count of 2 individuals). This indicates that as the tide rises and obscures the mudflat, these species fly out of the survey area to find high tide roosts elsewhere.

#### Redshank

5.1.4.22. Redshank was more abundant at low tide (peak count of 103 in November 2017) than high tide (peak count of 6) as it feeds on intertidal mud and was trherefrowe widespread in the survey area.

#### Turnstone

5.1.4.23. Turnstone were commonly recorded at high tide surveys with a peak count of 66 individuals in January 2018. During high tide this species were observed feeding around shingle and individuals are pushed towards the harbour wall by the rising tide Turnstone were less regularly recorded at low tide although a peak count of 34 individuals occurred in October 2017.

#### Sandwich tern

5.1.4.24. This migratory species is a qualifying feature of the Chichester and Langstone Harbour SPA as a breeding species, and was seen early in the survey period (October and November 2017) before vacating the area for its winter quarters. It was observed only at low tide, with a peak count of six individuals.

		•	-		-							
Latin name	Oct Low Tide	Oct High Tide	Nov Low Tide	Nov High Tide	Dec Low Tide	Dec High Tide	Jan Low Tide	Jan High Tide	Feb Low Tide	Feb High Tide	Mar Low Tide	Mar High Tide
Branta bernicla bernicla	408	172	617	333	970	95	667	795	1598	946	715	967
Tadorna tadorna	0	0	6	45	38	7	45	19	66	0	29	5
Anas crecca	1	0	23	0	46	33	2	8	50	27	0	16
Anas acuta	0	0	0	0	18	4	0	1	75	2	53	6
Spatula clypeata	0	0	0	0	2	0	0	0	0	0	0	0
Mergus serrator	0	2	3	12	1	2	4	0	2	5	0	0
Charadrius hiaticula	5	58	12	24	1	0	0	19	31	50	0	0
Pluvialis squatarola	10	0	9	0	4	0	19	0	4	1	3	0
Calidris alba	0	0	0	2	4	2	0	0	0	0	0	200
Calidris alpina	398	1	22	1	404	0	66	0	2014	9	167	0
Limosa Iapponica	0	0	0	0	0	0	1	0	0	0	0	0
Numenius arquata	18	0	15	0	16	0	24	0	61	0	15	2
Tringa totanus	75	0	103	0	51	3	16	5	47	0	25	6
Arenaria interpres	34	0	11	0	17	1	6	66	0	3	1	49
Thalasseus sandvicensis	6	0	2	0	0	0	0	0	0	0	0	0
	Branta bernicla bernicla Tadorna tadorna Anas crecca Anas acuta Spatula clypeata Spatula clypeata Mergus serrator Charadrius hiaticula Pluvialis squatarola Calidris alba Calidris alba Calidris alba Calidris alpina Limosa Iapponica Numenius arquata Tringa totanus Arenaria interpres	Latin nameLow rideBranta bernicla bernicla408Tadorna tadorna0Anas crecca1Anas acuta0Spatula clypeata0Mergus serrator0Charadrius hiaticula5Pluvialis squatarola10Calidris alba0Calidris alpina398Limosa lapponica0Numenius arquata18Tringa totanus75Arenaria interpres34	Latin nameLow TideHigh TideBranta bernicla408172Branta bernicla408172Tadorna tadorna00Anas crecca10Anas acuta00Spatula clypeata00Mergus serrator02Charadrius hiaticula558Pluvialis squatarola100Calidris alba00Calidris alpina3981Limosa lapponica180Numenius arquata750Arenaria interpres340	Latin nameLow rideHigh rideLow rideBranta bernicla408172617Dadorna tadorna006Anas crecca1023Anas acuta000Spatula clypeata000Mergus serrator023Charadrius hiaticula55812Pluvialis squatarola1000Calidris alba000Calidris alpina398122Limosa lapponica180103Numenius arquata750103Arenaria interpres3402	Latin nameLow TideHigh TideLow TideHigh TideBranta bernicla bernicla408172617333Tadorna tadorna00645Anas crecca10230Anas acuta0000Spatula clypeata0000Mergus serrator02312Charadrius hiaticula5581224Pluvialis squatarola10002Calidris alpina3981221Limosa lapponica1801030Arenaria interpres340110	Latin nameLow rideHigh rideLow rideHigh rideLow rideBranta bernicla bernicla408172617333970Tadorna tadorna0064538Anas crecca1023046Anas acuta000183Spatula clypeata00021Mergus serrator023121Charadrius hiaticula55812241Pluvialis squatarola10024Calidris alba0024Limosa lapponica0024Numenius arquata1800016Arenaria interpres340111017	Latin nameLow TideHigh TideLow TideHigh TideLow TideHigh TideBranta bernicla bernicla40817261733397095Tadorna tadorna0645387Anas crecca102304633Anas acuta000184Spatula clypeata00020Mergus serrator0231212Charadrius hiaticula558122410Pluvialis squatarola1000242Calidris alpina39812214040Limosa lapponica0015000Numenius arquata7501030513Arenaria interpres340110171	Latin nameLow rideHigh rideLow rideHigh rideLow rideHigh rideLow rideBranta bernicla bernicla40817261733397095.667Tadorna tadorna00645.38.745.Anas crecca1023046.33.2Anas acuta00018.40.0Spatula clypeata000200Mergus serrator0233.12.14.24.Charadrius hiaticula558.12.24.1.0.Pluvialis squatarola10024066.Limosa lapponica0021.40.66.Numenius arquata18.0.10.21.14.24.1.Numenius arquata18.0.0.2.4.0.66.Numenius arquata75.0.103.0.51.3.16.Arenaria interpres34.0.10.17.1.66.Thalasseus60200.0.0.0.	Latin nameLow TideHigh TideLow TideHigh TideLow TideHigh TideLow TideHigh TideBranta bernicla bernicla408172617333970950667795Tadoma tadoma06453874519Anas crecca10230463328Anas acuta0001840011Spatula clypeata0002000Mergus serrator0231214240Pluvialis squatarola1009040190Calidris alpina398122410000Calidris alpina39810024200Limosa arquata00024200Numenius arquata18000000000Numenius arquata75010305131655Arenaria interpres340130171666Arenaria interpres6000000000Arenaria interpres60000000000	Latin nameLow tideHigh tideLow tideHigh tideLow tideHigh tideLow tideHigh tideLow tideBranta bernicla bernicla408172617333970956677951598Tadoma tadoma006453874519667Tadoma tadoma006453874519667Anas crecca1023046332850Anas acuta0001840175Spatula clypeata0001200000Mergus serrator02312142401931Pluvialis squatarola10002400000Pluvialis squatarola10002420000Calidri salba0002420020141011	Latin nameLow TideHigh Tid	Latin nameLow TideHigh TideLow TideTad



Low Tide Peak Count	High Tide Peak Count	Total Obs.
1598	967	8283
66	45	260
50	33	206
75	6	159
2	0	2
4	12	31
31	58	200
19	1	50
4	200	208
2014	9	3082
1	0	1
61	2	151
103	6	331
34	66	188
6	0	8

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<sup>&</sup>lt;sup>5</sup> Shows qualifying features of Chichester and Langstone Harbours SPA only. Appendix 16.14 of the ES provides details of all bird species recorfed during the surveys.



- 5.1.4.25. Twenty-nine species of bird were observed at the vantage points comprising 3,515 individual bird observations. Broadly, the community of birds in flight was dominated by brent geese.
- 5.1.4.26. At the northern vantage (Farlington Marshes) point the majority of birds were observed flying north out of the harbour, with dark-bellied brent geese and gulls the dominant bird groups. This is likely due to a strong northerly movement of these birds to roost sites within the harbour at dawn to feeding sites inland to the north. Data does not indicate a return flight into the estuary as few of the vantage point counts were undertaken at dusk, whereas one was always undertaken at close to dawn. The northerly movement takes birds across the A27, a busy carriageway.
- 5.1.4.27. The southern vantage point showed that a roughly equal east-west movement of birds along Eastney Beach, with the bird community dominated by brent geese and waders (namely large groups of dunlin), with a significant passage of gulls also. The data show that although some birds fly across the beach to reach the harbour behind, most prefer to follow the coastline to access the harbour via Fort Cumberland/Gunner Point.

#### **Onshore Cable Route**

- 5.1.4.28. Breeding bird surveys were undertaken in onshore areas inland of landfall at Eastney Beach, specifically targeting black redstart and Dartford Warbler (ES Technical Appendix 16.12). While these species are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) neither represent qualifying features of any adjacent European sites. The former species was recorded breeding within the survey area. A suite of further common and widespread breeding bird species were located.
- 5.1.4.29. Wintering bird surveys of the same area of terrestrial habitats were also undertaken (ES Technical Appendix 16.13). The majority of birds encountered were common and widespread wintering bird species often found in semi-natural habitats. Three species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded: Dartford Warbler, Cetti's warbler and black redstart.
- 5.1.4.30. To supplement the surveys of intertidal habitats, parallel surveys of Solent Waders and Brent Goose Strategy sites (SWBGS) were surveyed in parallel (ES Technical Appendix 16.13). The SWBGS as defined in King (2010) and Whitfield (2019) is a conservation partnership project, which aims to conserve the internationally important brent goose and wading bird populations within and around the Special Protection Areas and Ramsar wetlands of the Solent coast. These sites are terrestrial habitats that in effect provide functional linkage to the SPAs including Chichester and Langstone Harbours (See Section 6.3). The distribution of SWBGS sites within or adjacent to the Peoposed Development are presented in Plate 5.4.



5.1.4.31. Surveyors visited 22 sites identified in the SWBGS for the South-East Hampshire Coast (Figure 03). Using direct counts, brent geese, gulls and other species were identified and their numbers and behaviour recorded.

#### **Converter Station Area**

5.1.4.32. Breeding bird surveys were completed at the Converter Station Area (ES Technical Appendix 16.12). Species present and confirmed breeding consisted of a suite of widespread species typical of the arable and grassland habitats present. No species recorded were relvant to any regional European sites.

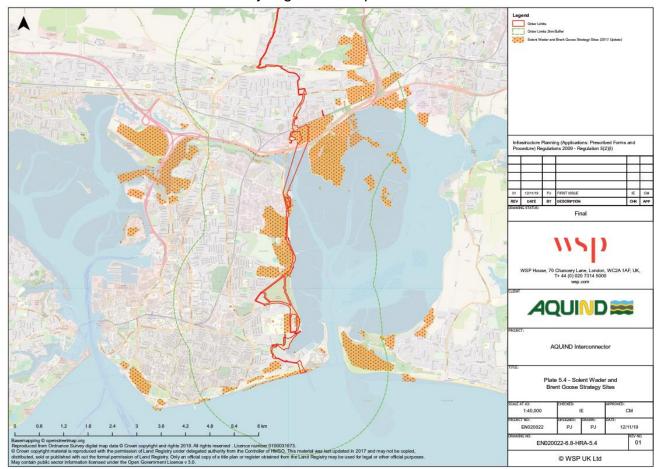


Plate 5.4 – Solent Wader and Brent Goose Strategy Sites

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# AQUIND 6. IDENTIFICATION OF EUROPEAN SITES AND POTENTIAL EFFECTS

### 6.1. OVERVIEW

- 6.1.1.1. Given the linear nature of the Proposed Development and the number of European sites and/or European offshore marine sites that could potentially be affected, an initial pre-LSE screening stage has been introduced into the process. This stage is essentially a site-identification / selection process, which, while it forms part of the overall LSE determination stage of HRA, has been separated out to allow a subsequent focus (in Section 7) on those sites where the Proposed Development is considered to have a potential for a LSE.
- 6.1.1.2. The criteria used in this first stage of selection takes account of the location of the European sites (including Ramsar sites) in relation to Proposed Development, the ZOI of potential effects of the Proposed Development, and the ecology and distribution of qualifying features. These criteria are described in Table 6-1.

#### Table 6.1 - Criteria used for initial identification of relevant European sites

	Criteria
1	Proposed Development boundaries overlap with European site.
2	European site supports mobile populations of qualifying features (e.g., Annex I birds, Annex II marine mammals, migratory fish, bats and otters) that may interact with potential effects associated with Proposed Development.
3	European sites and/or qualifying features located within the potential ZOI of effects associated with Proposed Development (e.g., habitat loss/disturbance, noise).
4	European sites with primary reasons or qualifying features for site selection recorded during baseline surveys.

6.1.1.3. This initial screening will exclude or pre-screen out sites where the Proposed Development is considered to have no potential for a LSE. Sites not excluded at this stage are taken forward for a detailed determination of LSE in Section 7.



# 6.2. INITIAL IDENTIFICATION OF SITES AND FEATURES – MARINE ENVIRONMENT

#### 6.2.1. OVERVIEW

- 6.2.1.1. The approach applied to the initial pre-LSE screening stage is analogous to The Crown Estate's Appropriate Assessment of the Round 3 Plan (Entec, 2009). This identified five categories of European and Ramsar sites for which LSE could not be excluded in the marine environment:
  - SACs and Ramsar sites designated for Annex II diadramous migratory fish;
  - SACs and Ramsar sites designated for Annex II marine mammals;
  - SACs and Ramsar sites designated for marine and coastal habitats; and
  - SPAs and Ramsar sites designated for Annex I and regularly occurring migratory marine birds.
- 6.2.1.2. This section should be read in conjunction with Appendix 1 of this report (document reference 6.8.3.1) which presents the PINS screening matrices for sites that have been pre-screened out for further assessment.

#### 6.2.2. ANNEX I HABITATS

6.2.2.1. The potential for connectivity with the Proposed Development is determined based on the outputs of sediment plume dispersion modelling undertaken to assess the plumes of suspended sediment created during sediment disposal operations resulting from sandwave clearance. The maximum extent of the plume extends up to 25 km from the Marine Cable Corridor during dredge disposal activities along an east-west axis. This extent defines the ZOI for Annex I Habitats (Appendix 6.2 – Modelling Technical Report of the ES Volume 3, document reference 6.3.6.2).

#### Pre-Screening of Designated Sites

- 6.2.2.2. The Marine Cable Corridor overlaps with Solent Maritime SAC and lies 3.3 km and 4.6 km from South Wight Maritime SAC and Solent and the Isle of Wight Lagoons SAC respectively. These sites therefore have the potential for connectivity. Figures 4-1 and 4-2 (document references 6.8.2.4.1 and 6.8.2.4.2) illustrate the locations of sites considered.
- 6.2.2.3. At a minimum distance of 34 km to the south west of the Marine Cable Corridor, Wight-Barfleur Reef SAC is positioned outside the ZOI. It is therefore considered that there is no connectivity with Wight-Barfleur Reef SAC and it is screened out of this assessment.
- 6.2.2.4. Bassurelle Sandbank SAC crosses the EEZ and lies in both UK and French waters. The UK Section, the Bassurelle sandbank, is approximately 60 km east of the Marine Cable Corridor, while the French part, Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC, is 58.8 km from the Proposed Development. There is therefore



no connectivity with the Bassurelle Sandbank SAC (or associated ZSC) and they are therefore screened out of this assessment.

- 6.2.2.5. Studland to Portland SAC is approximately 70 km west of the Marine Cable Corridor and it is therefore considered that there is no connectivity with this SAC and it is therefore screened out of this assessment.
- 6.2.2.6. An additional SAC located entirely in French waters with close proximity to the Proposed Development is Littoral Cauchois ZSC, however this site is located 52.7 km from the Marine Cable Corridor at its nearest point. There is therefore no connectivity with any Annex I habitats present within the Littoral Cauchois ZSC, and effects on Annex I habitats within this ZSC are screened out of further assessment.

#### Pre-Screening of Features within Designated Sites

6.2.2.7. Solent Maritime SAC, South Wight Maritime SAC and Solent and Isle of Wight Lagoons are large sites which are not fully encompassed within the ZOI. As such, a detailed assessment of connectivity is undertaken to determine connectivity at a qualifying feature level (see Table 6-2).

#### Table 6.2 - Pre-screening of Annex I Habitat Qualifying Features

Site	Qualifying Feature
Solent Maritime SAC	Terrestrial features have no connectivity with the proposed marine activities. There is no potential for LSE and these features basis. This includes annual vegetation of drift lines [1210], perennial vegetation of stony banks [1220], shifting dunes Ammophila arenaria ("white dunes") [2120] and Desmoulin's whorl snail (Vertigo moulinsiana) [1016].
	<b>Coastal lagoons [1150]</b> within the Solent Maritime SAC are located at a minimum distance of 8 km from the Proposed Devisolated from open waters by means of a sluice or seawall and therefore have no connectivity with the proposed activities, pare therefore screened out of the assessment.
	Estuaries [1130] are in close proximity to proposed activities and within the likely ZOI of the passive sediment plume. Conn therefore Estuaries will be assessed for LSE within the assessment.
	Sandbanks which are slightly covered by sea water all the time [1110] are located at the border of the intertidal and sub Corridor with a potential minimum distance of 0.24 km to the HDD entry/exit location (between KP1 and KP1.6). Connectivity Sandbanks which are slightly covered by sea water all the time will be considered for LSE within the assessment.
	<b>Mudflats and sandflats not covered by seawater at low tide [1140]</b> are located within the Marine Cable Corridor with a p to the HDD entry/exit location (between KP1 and KP1.6). Connectivity cannot therefore be excluded, and Mudflats and sand tide will be considered for LSE within the assessment.
	<b>Spartina swards [1320].</b> Solent Maritime is the only site for smooth cord-grass Spartina alterniflora in the UK and is one of amounts of small cord-grass S. maritima are found. It is also one of the few remaining sites for Townsend's cord-grass (S. x areas of common cord-grass Spartina anglica, all four taxa thus occurring here in close proximity. Connectivity cannot be expected by assessed for LSE within the assessment.
	Atlantic salt meadows [1330]. Solent Maritime is a composite site composed of a large number of separate areas of saltma estuary, the salt meadows at this site are notable as being representative of the ungrazed type and support a different range purslane ( <i>Atriplex portulacoides</i> ), common sea-lavender ( <i>Limonium vulgare</i> ) and thrift ( <i>Armeria maritima</i> ). Connectivity canne feature will be assessed for LSE within the assessment.
	Salicornia and other annuals colonising mud and sand [1310] for which the area is considered to support a significant p excluded, and therefore this feature will be assessed for LSE within the assessment.
South Wight Maritime SAC	Terrestrial features have no connectivity with marine activities and there is no potential for LSE. This applies to Vegetated s Coasts [1230] and it is therefore screened out of the assessment.
	<b>Submerged or partially submerged sea caves [8330]</b> occur intertidally in the chalk cliffs at the western end of the site bet (minimum 37 km from the Marine Cable Corridor, 50 km by sea) and are outside of the ZOI. Intertidal sea caves are also fou Isle of Wight, to the west of the Marine Cable Corridor at a minimum distance of 10 km. Connectivity cannot therefore be exponented sea caves will be considered for LSE within the assessment.
	<b>Reefs [1170]</b> are located in the subtidal area to the east of the Isle of Wight, at a minimum distance of 3.3 km from the Marin cannot therefore be excluded, and Reefs will be considered for LSE within the assessment.
Solent and Isle of Wight Lagoons SAC	Located at a distance of 5 km from the Marine Cable Corridor, the Solent and Isle of Wight Lagoons SAC includes fourteen ([1150]), the closest of which is located in Langstone Harbour (5 km), followed by Gilkicker (7 km), and four at Bembridge on marine features, but they are isolated from the sea by a sluice or seawall, receiving seawater either through percolation, cult considered that the Solent and Isle of Wight Lagoons site does not have connectivity with the Proposed Development and is assessment.



es are therefore screened out on this es along the shoreline with

evelopment. The lagoons are however precluding the possibility of LSE, and

nnectivity cannot be excluded, and

ubtidal zones within the Marine Cable ity cannot therefore be excluded, and

potential minimum distance of 0.2 km adflats not covered by seawater at low

of only two sites where significant *x townsendii)* and holds extensive excluded, and therefore this feature will

narsh. In contrast to the Severn ge of communities dominated by seannot be excluded, and therefore this

presence. Connectivity cannot be

#### sea cliffs of the Atlantic and Baltic

etween Alum Bay and Freshwater Bay ound at the base of Culver Cliff on the excluded and submerged or partially

rine Cable Corridor. Connectivity

n coastal lagoons (**Coastal Lagoons** on the Isle of Wight (8 km). These are ulverts or spring tides. It is therefore is therefore screened out of the

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#### Summary of Pre-screening

6.2.2.8. Table 6-3 shows where there is no connectivity between the Proposed Development and an SAC and its features, and also those sites/features for which LSE cannot be discounted.

## Table 6.3 - European sites designated for Annex I habitats for which no connectivity exists and also for sites where LSE cannot be discounted

European Site	Approximate Distance from the Proposed Development (km)	Qualifying features	Pre-Screened in?
Solent Maritime SAC	0.0	Estuaries [1130]	Yes
540		Mudflats and sandflats (not submerged at low tide) [1140]	Yes
		Sandbanks (slightly covered by seawater all the time) [1110]	Yes
		Shifting dunes along the shoreline [2120]	No – terrestrial feature, no connectivity to marine activities
		Coastal lagoons [1150]	No – no connectivity due to isolation from sea and distance from activities
			Annual vegetation of drift lines [1210]
		Perennial vegetation of stony banks [1220]	No – terrestrial feature, no connectivity to marine activities
		Salicornia and other annuals colonising mud and sand [1310]	Yes
		<i>Spartina</i> swards [1320].	Yes
		Atlantic salt meadows [1330].	Yes
		Desmoulin's whorl snail ( <i>Vertigo moulinsiana</i> ) [1016]	No – terrestrial species, no connectivity to marine activities



European Site	Approximate Distance from the Proposed Development (km)	Qualifying features	Pre-Screened in?
South Wight Maritime	3.3	Reefs [1170]	Yes
SAC		Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]	No – terrestrial feature, no connectivity to marine activities
		Submerged or partially submerged sea caves [8330]	Yes
Solent and Isle of Wight Lagoons SAC	4.6	Coastal lagoons [1150]	No – no connectivity due to isolation from sea and distance from activities
Wight- Barfleur Reef SAC	34.0	Reefs [1170]	No – outside the ZOI
Bassurelle Sandbank SAC	60.0	Sandbanks (slightly covered by seawater all the time) [1110]	No – outside the ZOI
Studland to Portland SAC	70.0	Reefs [1170]	No – outside the ZOI
Ridens et dunes hydrauliques du détroit du Pas-de- Calais ZSC	58.8	Annex I habitats	No – outside the ZOI
Littoral Cauchois ZSC	52.7	Annex I habitats	No – outside the ZOI

#### 6.2.3. ANNEX II DIADRAMOUS MIGRATORY FISH

6.2.3.1. The Proposed Development does not overlap the boundary of any European site which lists Annex II diadromous migratory fish as interest features and therefore no direct effects are expected. It is however, within the migratory range of Annex II fish species from a number of SACs on both the English and French side of the Channel. Pre-screening of sites for potential connectivity considered that all UK sites designated for Annex II diadromous fish species which connect to the Channel via



estuaries or rivers may have connectivity to the project (Figure 4-3, document reference 6.8.2.4.3). For designated sites in French waters, all designated sites within the eastern Channel with Annex II diadromous fish features were considered to have potential for connectivity (Figure 4-4, document reference 6.8.2.4.4). Those sites in French waters, west of the Bay of Seine were considered too distant to have potential for connectivity with the project.

6.2.3.2. Eight European sites which list Annex II diadromous migratory fish have been identified as requiring further assessment due to potential connectivity with the project (Table 6-4).

### Table 6.4 - Designated Sites with Potential for LSE on Annex II diadromous migratory fish

European Site	Approximate Distance from the Proposed Development (km)	Qualifying Features	Pre- Screened In?
River Itchen SAC	27.5	Salmon	Yes
River Avon SAC	51.4	Salmon Sea lamprey	Yes
Littoral Cauchois ZSC	52.7	Twaite shad Sea lamprey River lamprey	Yes
Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC	84.6	River lamprey	Yes
Baie de Canche et Couloir des trois Estuaires ZSC	86.5	Allis shad Sea lamprey River lamprey Salmon	Yes
Baie de Seine Orientale ZSC	90.9	Allis shad Twaite shad Sea lamprey River lamprey Salmon	Yes
River Axe SAC	168	Sea lamprey	Yes
Plymouth Sound and Estuaries SAC	229	Allis shad	Yes

#### 6.2.4. MARINE MAMMALS

6.2.4.1. The potential for connectivity between the Proposed Development and SACs for which marine mammals are a primary reason for site selection/qualifying feature was



assessed based on whether the Proposed Development fell within the likely foraging range of seals or likely population range of cetaceans using these SACs<sup>6</sup> (Appendix 2 of this report, document reference 6.8.3.2 and Figures 4-5 and 4-6, document references 6.8.2.4.5 and 6.8.2.4.6). Foraging range information for seals came from telemetry studies (mainly Sharples *et al.*, 2012, Russell *et al.*, 2017 and Vincent *et al.*, 2017). However, telemetry studies have not been conducted for cetaceans in either the UK or France. Therefore, information on likely population range for cetacean species which are a feature of the closest SACs to the Proposed Development was used. For bottlenose dolphins this mainly came from individual identification (photo-ID) data (Pesante *et al.*, 2008; Brereton *et al.*, 2016). For harbour porpoises the Small Cetaceans in European Atlantic Waters and the North Sea ('SCANS') and SCANS II data (model-based density surfaces) were used (Hammond *et al.*, 2013); these have yet to be released for SCANS III.

6.2.4.2. The closest UK SACs for each Annex II marine mammal species were as follows:

- Grey seal Pembrokeshire Marine (542 km);
- Harbour seal The Wash and North Norfolk Coast (370 km)<sup>7</sup>;
- Bottlenose dolphin Cardigan Bay (618 km); and
- Harbour porpoise Southern North Sea (137 km; Figure 4-5).
- 6.2.4.3. None of the UK marine mammal SACs considered were deemed to be close enough to the Proposed Development for there to be potential for connectivity (Appendix 2<sup>8</sup>) and have therefore been pre-screened out.
- 6.2.4.4. There is, however, considered to be potential for connectivity between the Proposed Development and seven French ZSCs which have been designated for marine mammals and one French Ramsar, for which grey and harbour seals were listed as 'species whose presence explains the international importance of the site', which are located in the eastern Channel (Table 6-5 and Figure 4-6). This is because the Proposed Development is considered to fall within the likely population range of cetacean species and/or the likely foraging range of seal species which are features of these ZSCs/Ramsars. Due to the potential for transboundary effects, these ZSCs/Ramsars (Table 6-5) have been pre-screened in for further assessment.

<sup>&</sup>lt;sup>6</sup> Ramsar sites for which marine mammals were listed as 'species whose presence explains the international importance of the site' were also considered.

<sup>&</sup>lt;sup>7</sup> The Wash Ramsar is also present at this location.

<sup>&</sup>lt;sup>8</sup> Natural England confirmed that they agreed with the conclusions of this document on 03/05/2019 by e-mail.



Table 6.5 - Designated Sites with marine mammal features where there is potential for LSE

LSE			
European Site	Approximate closest distance to the Proposed Development by sea (km)	Qualifying Features	Pre-Screened In?
Littoral Cauchois ZSC	53	Bottlenose dolphin Harbour porpoise Grey seal Harbour seal	Yes
Ridens et dunes hydrauliques du détroit du Pas-de- Calais ZSC	59	Harbour porpoise Grey seal Harbour seal	Yes
Baie de Canche et couloir des trois estuaires ZSC	85	Harbour porpoise Grey seal Harbour seal	Yes
Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar <sup>9</sup>	87	Bottlenose dolphin Harbour porpoise Grey seal Harbour seal	Yes
Estuaire de la Seine ZSC <sup>10</sup>	90	Harbour porpoise Grey seal Harbour seal	Yes
Baie de Seine orientale ZSC	91	Bottlenose dolphin Harbour porpoise Grey seal Harbour seal	Yes
Récifs Gris-Nez Blanc- Nez ZSC	104	Harbour porpoise Grey seal Harbour seal	Yes
Southern North Sea SAC	137	Harbour porpoise	No
The Wash and North Norfolk Coast SAC	370	Harbour seal	No
Pembrokeshire Marine SAC	542	Grey seal	No

<sup>&</sup>lt;sup>9</sup> Of the four marine mammal features of the SAC which is in the same location, only grey seal and harbour seal are listed as 'species whose presence explains the international importance of the site' for the Baie de Somme Ramsar.

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<sup>&</sup>lt;sup>10</sup> The Marais Vernier et Vallée de la Risle maritime Ramsar, which lists harbour seal under 'Noteworthy fauna', is in the same location as this SAC.



European Site	Approximate closest distance to the Proposed Development by sea (km)	Qualifying Features	Pre-Screened In?
Cardigan Bay SAC	618	Bottlenose dolphin Grey seal	No

#### 6.2.5. MARINE ORNITHOLOGY

- 6.2.5.1. The Birds Directive provides for the protection, management and control of all species of naturally occurring wild birds in the European territory of Member States. SPAs are strictly protected sites classified in accordance with Article 4 of the EC Birds Directive (2009). They are classified for rare and vulnerable birds (as listed on Annex I of the Directive) and for regularly occurring migratory species. UK Government policy states that Ramsar sites (designated under the Ramsar Convention 1971) and pSPAs are afforded the same protection as SPAs for the purpose of considering development proposals that may affect them.
- 6.2.5.2. The Proposed Development passes through the Solent and Dorset Coast pSPA from the Landfall at Eastney out to approximately to KP16. This site is proposed to protect the marine foraging areas of qualifying interest features from colonies within adjacent classified SPAs: Poole Harbour SPA, Solent and Southampton Water SPA and Chichester and Langstone Harbour SPA. The qualifying interest features are common tern, Sandwich tern and little tern, with the site supporting more than 1% of the Great British breeding population of each species. Given that the Marine Cable Corridor passes through this pSPA, there is potential for LSE and this site has been pre-screened in for further assessment.
- 6.2.5.3. Table 6-6 summarises the pre-screening on the Solent and Dorset Coast pSPA features, in addition to other marine ornithology features known to be present within the study area.
- 6.2.5.4. The potential for LSE on features which are present above MLWS (e.g. terrestrial and intertidal species) is assessed separately in Section 6.3 (Onshore). It is considered that there is no route to impact on these features from activities within the Marine Cable Corridor and they are therefore not considered further within the marine section.
- 6.2.5.5. Where a mean-maximum foraging range, or more recent tracking data (where available), has been used to assess the potential for breeding seabirds to interact with the Proposed Development, the distance calculated is based on the boundary of the SPA site to the boundary of the Proposed Development.
- 6.2.5.6. The potential for LSE on supporting habitat (water column) is also considered in addition to marine ornithology features for UK SPA and Ramsar sites (see Consultation Report Doc.Ref. 5.1).



- 6.2.5.7. Following the initial pre-LSE screening stage outlined in Table 6-6 below, the following European sites have been screened out from further assessment as due to the distance of the sites from the Proposed Development and the mean-maximum forgaing range of their features, it is considered that there is no potential for connectivity with the Proposed Development (see Figures 4-7 and 4-8):
  - Dungeness, Romney Marsh and Rye Bay SPA/Ramsar site;
  - Poole Harbour SPA; and
  - Estuaire et Marais de la Basse Seine SPA.

Relevant SPA/Ramsar	Indicative distance from SPA/Ramsar to Proposed Development	Features present in the study area	Use of Proposed Development	Mean-maximum breeding season foraging range (Thaxter <i>et al.</i> , 2012)	Pre-screened in?
Solent and Dorset Coast pSPA	0.0 km*	Sandwich tern (B)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	Yes, qualifying feature within foraging distance of the Proposed Development.
		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	Yes, qualifying feature within foraging distance of the Proposed Development.
		Little tern (B)	Summer visitor present in low to moderate densities within coastal waters between April and September.	6.3 km	Yes, qualifying feature within foraging distance of the Proposed Development.
		Supporting habitat (water column)	N/A	N/A	Yes, supporting habitat of qualifying feature
Chichester and Langstone Harbours	0.1 km	Red-breasted merganser (W)	Present in inshore waters during the winter, with concentrations in Chichester, Langstone and Portsmouth Harbours.	N/A	Yes, qualifying feature within foraging distance of the Proposed Development.
SPA/Ramsar site		Sandwich tern (B)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	Yes, qualifying feature foraging distance of the Proposed Development.
		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	Yes, qualifying feature within foraging distance of the Proposed Development.
		Little tern (B)	Summer visitor present in low to moderate densities within coastal waters between April and September.	6.3 km	Yes, qualifying feature within foraging distance of the Proposed Development.
		Supporting habitat (water column)	N/A	N/A	Yes, supporting habitat of qualifying feature
Portsmouth Harbour SPA/Ramsar site	4.9 km	Red-breasted merganser (W)	Present in inshore waters during the winter, with concentrations in Chichester, Langstone and Portsmouth Harbours.	N/A	Yes, qualifying feature within foraging distance of the Proposed Development.
		Supporting habitat (water column)	N/A	N/A	Yes, supporting habitat of qualifying feature
Solent and Southampton Water SPA/Ramsar site	6.6 km	Sandwich tern (B)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	Yes, qualifying feature within foraging distance of the Proposed Development.
		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	Yes, qualifying feature within foraging distance of the Proposed Development.
		Roseate tern (B)	Summer visitor present in very low densities within inshore waters between May and August.	16.6 km	Yes, qualifying feature within foraging distance of the Proposed Development.

 Table 6.6 - Potential for LSE on SPA and Ramsar marine ornithological features



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Relevant SPA/Ramsar	Indicative distance from SPA/Ramsar to Proposed Development	Features present in the study area	Use of Proposed Development	Mean-maximum breeding season foraging range (Thaxter <i>et al.</i> , 2012)	Pre-scre
		Little tern (B)	Summer visitor present in low to moderate densities within coastal waters between April and September.	6.3 km	Yes, qual distance
		Mediterranean gull (B)	Present year-round in low-moderate densities, predominantly in coastal waters.	20.0 km	Yes, qual distance
		Supporting habitat (water column)	N/A	N/A	Yes, supp
Pagham Harbour SPA/Ramsar site	9.5 km	Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	Yes, qual distance
		Little tern (B)	Summer visitor present in low to moderate densities within coastal waters between April and September.	6.3 km	No, no co and Prop
		Supporting habitat (water column)	N/A	N/A	Yes, supp
Littoral-Seino Marin SPA	n 30.6 km	Common scoter (W)	Present from early autumn through the winter months at low densities, largely in inshore waters. Higher densities occur elsewhere along the southern coast of England.	N/A	No, no co and Prop
		Eider (W)	Present in low densities largely in inshore waters during mid-winter.	N/A	No, no co and Prop
		Red-throated diver (W)	Present during winter at a low density in coastal waters.	N/A	No, no co and Prop
		Great northern diver (W)	Scarce winter visitor, present in very low densities in coastal waters.	N/A	No, no co and Prop
		Black-throated diver (W)	Scarce winter visitor, present in very low densities in coastal waters.	N/A	No, no co and Prop
		Great crested grebe (W)	Present in inshore waters during winter at a low density	N/A	No, no co and Prop
		Black-necked grebe (W)	Present along the Hampshire and Dorset coastlines, particularly in Langstone and Poole Harbours	N/A	No, no co and Prop
		Slavonian grebe (W)	Present along the Sussex coast in relatively low densities, particularly in Pagham Harbour.	N/A	No, no co and Prop
		Red-breasted merganser (W)	Present in inshore waters during the winter, with concentrations in Chichester, Langstone and Portsmouth Harbours.	N/A	No, no co and Prop
		Fulmar (B)	Present throughout the Channel year-round, but widely distributed at sea, with relatively low densities present in study area.	400.0 km	Yes, qual distance



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Relevant SPA/Ramsar	Indicative distance from SPA/Ramsar to Proposed Development	Features present in the study area	Use of Proposed Development	Mean-maximum breeding season foraging range (Thaxter <i>et al.</i> , 2012)	Pre-scree
		Manx shearwater (P)	Peak numbers present during passage periods with low densities also present during the breeding season.	N/A	No, no co and Propo
		Balearic shearwater (P)	Low densities present during passage, peaking in autumn.	N/A	No, no co and Propo
		Storm petrel (P)	Low densities present year-round, peaking during migration.	N/A	No, no co and Propo
		Gannet (W)	Moderate densities present throughout the Channel year-round.	N/A	No, no co and Propo
		Cormorant (B)	Low-moderate densities present year-round in inshore waters.	25.0 km	No, no co and Propo
		Shag (B)	Low densities present year-round in inshore waters	14.5 km	No, no co and Propo
		Great skua (P)	Low densities present during passage.	N/A	No, no co and Propo
		Arctic skua (P)	Low densities present during passage.	N/A	No, no co and Propo
		Pomarine skua (P)	Very low densities present during passage.	N/A	No, no co and Prope
		Sandwich tern (P)	Summer visitor present in moderate densities within inshore waters between March and September.	N/A	No, no co and Propo
		Common tern (P)	Summer visitor present in moderate densities within inshore waters between April and September.	N/A	No, no co and Propo
		Arctic tern (P)	Low densities present during passage as birds breeding at more northerly colonies pass through the Channel.	N/A	No, no co and Propo
		Little tern (P)	Summer visitor present in low to moderate densities within coastal waters between April and September.	N/A	No, no co and Propo
		Great black-backed gull (B)	Present year-round in low-moderate densities throughout the Channel.	61.1 km**	Yes, quali distance d
		Herring gull (B)	Present year-round in moderate densities throughout the Channel.	61.1 km	Yes, quali distance c
		Lesser black-backed gull (W)	Present year-round in moderate densities throughout the Channel.	N/A	No, no co and Propo
		Kittiwake (B)	Present throughout the Channel year-round with higher densities present in the winter.	60.0 km	Yes, quali distance c

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Relevant SPA/Ramsar	Indicative distance from SPA/Ramsar to Proposed Development	Features present in the study area	Use of Proposed Development	Mean-maximum breeding season foraging range (Thaxter <i>et al.</i> , 2012)	Pre-scre
		Mediterranean gull (W)	Present year-round in low-moderate densities, predominantly in coastal waters.	N/A	No, no co and Prop
		Little gull (W)	Present throughout the Channel in low densities during migration.	N/A	No, no co and Prop
		Guillemot (W)	Present throughout the Channel year-round in moderate densities. Higher densities present in the winter.	N/A	No, no co and Prop
		Razorbill (W)	Present throughout the Channel year-round in low-moderate densities. Higher densities present in the winter.	N/A	No, no co and Prop
Dungeness, Romney Marsh and Rye Bay	61.0 km	Sandwich tern (B)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	No, no co and Prop
SPA/Ramsar site		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	No, no co and Prop
		Little tern (B)	Summer visitor present in low to moderate densities within coastal waters between April and September.	6.3 km	No, no co and Prop
		Mediterranean gull (B)	Present year-round in low-moderate densities, predominantly in coastal waters.	20.0 km	No, no co and Prop
		Supporting habitat (water column)	N/A	N/A	No, no co and Prop
Poole Harbour SPA	63.8 km	Sandwich tern (B)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	No, no co and Prop
		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	No, no co and Prop
		Mediterranean gull (B)	Present year-round in low-moderate densities, predominantly in coastal waters.	20.0 km	No, no co and Prop
		Supporting habitat (water column)	N/A	N/A	No, no co and Prop
Estuaire et Marais de la Basse Seine SPA/ZPS	86.9 km	Common scoter (W)	Present from early autumn through the winter months at low densities, largely in inshore waters. Higher densities occur elsewhere along the southern coast of England.	N/A	No, no co and Prop
		Eider (W)	Present in low densities largely in inshore waters during mid-winter	N/A	No, no co and Prop



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Relevant SPA/Ramsar	Indicative distance from SPA/Ramsar to Proposed Development	Features present in the study area	Use of Proposed Development	Mean-maximum breeding season foraging range (Thaxter <i>et al.</i> , 2012)	Pre-scree
		Red-throated diver (W)	Present during winter at a low density in coastal waters.	N/A	No, no co and Prope
		Great northern diver (W)	Scarce winter visitor, present in very low densities in coastal waters.	N/A	No, no co and Prope
		Black-throated diver (W)	Scarce winter visitor, present in very low densities in coastal waters.	N/A	No, no co and Propo
		Cormorant (W)	Low-moderate densities present year-round in inshore waters.	N/A	No, no co and Propo
		Great crested grebe (W)	Present in inshore waters during winter at a low density	N/A	No, no co and Propo
		Red-necked grebe (W)	Present in inshore waters during winter at a low density	N/A	No, no co and Propo
		Slavonian grebe (W)	Present along the Sussex coast in relatively low densities, particularly in Pagham Harbour.	N/A	No, no co and Propo
		Red-breasted merganser (W)	Present in inshore waters during the winter, with concentrations in Chichester, Langstone and Portsmouth Harbours.	N/A	No, no co and Propo
		Great skua (P)	Low densities present during passage.	N/A	No, no co and Propo
		Arctic skua (P)	Low densities present during passage.	N/A	No, no co and Prope
		Sandwich tern (P)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	No, no co and Propo
		Common tern (P)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	No, no co and Prope
		Arctic tern (P)	Low densities present during passage as birds breeding at more northerly colonies pass through the Channel.	N/A	No, no co and Propo
		Mediterranean gull (P)	Present year-round in low-moderate densities, predominantly in coastal waters.	20.0 km	No, no co and Propo
		Little gull (P)	Present throughout the Channel in low densities during migration.	N/A	No, no co and Propo
		Guillemot (W)	Present throughout the Channel year-round in moderate densities. Higher densities present in the winter.	N/A	No, no co and Propo
		Razorbill (W)	Present throughout the Channel year-round in low-moderate densities. Higher densities present in the winter.	N/A	No, no co and Propo



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Relevant SPA/Ramsar	Indicative distance from SPA/Ramsar to Proposed Development	Features present in the study area	Use of Proposed Development	Mean-maximum breeding season foraging range (Thaxter <i>et al.</i> , 2012)	Pre-scre
Alderney West Coast and Burhou Islands Ramsar site	142.0 km	Storm petrel (B)	Peak numbers present during passage periods with low densities also present during the breeding season.	>65.0 km	Yes, qual distance
		Gannet (B)	Gannets are present in the Channel year- round, being one of the most frequently recorded species encountered. Peak numbers occur during the breeding season	229.4 km**	Yes, qual distance
		Great black-backed gull (B)	Present year-round in low-moderate densities throughout the Channel.	61.1 km***	No, no co and Prop
		Cormorant (B)	Low-moderate densities present year-round in inshore waters.	25.0 km	No, no co and Prop
		Shag (B)	Low densities present year-round in inshore waters	14.5 km	No, no co and Prop
		Herring gull (B)	Present year-round in moderate densities throughout the Channel.	61.1 km	No, no co and Prop
		Lesser black-backed gull (B)	Present year-round in moderate densities throughout the Channel.	141.0 km	Yes, qual distance
		Kittiwake (B)	Present throughout the Channel year-round with higher densities present in the winter. This species is no longer present within this Ramsar (D. Clifford 2019, pers. comm.).	60.0 km	No, no co and Prop and spec the Rams
		Guillemot (B)	Present throughout the Channel year-round in moderate densities. Higher densities present in the winter.	84.2 km	No, no co and Prop
		Razorbill (B)	Present throughout the Channel year-round in low-moderate densities. Higher densities present in the winter.	48.5 km	No, no co and Prop
		Puffin (B)	Present throughout the Channel year-round in low-moderate densities. Higher densities present in the winter.	105.4 km	No, no co and Prop

**Key:** (B) = breeding; (W) = wintering; (P) = passage; \* = Proposed Development overlaps with this designated site; \*\* = considered to be conservative based on mean-maximum foraging ranges of gannets breeding at Les Etacs and Ortac, Alderney, as presented in Warwick-Evans *et al.*, (2016); \*\*\* = in the absence of a species-specific mean-max foraging range, herring gull was used as a proxy for great black-backed gull. Herring gull was considered to be the most suitable model species, as lesser black-backed gull (*Larus fuscus*) is a long distant migrant (unlike great black-backed gull) and is morphologically adapted to longer flights (Snow & Perrins 1998; Klaassen *et al.*, 2011). The mean maximum foraging range cited for herring gull is 61.1 ± 44 km (Thaxter *et al.*, 2012).



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connectivity between qualifying feature posed Development due to distance.

connectivity between qualifying feature posed Development due to distance.

WSP/Natural Power



# 6.3. INITIAL IDENTIFICATION OF SITES AND FEATURES – ONSHORE ENVIRONMENT

#### 6.3.1. SITES DESIGNATED FOR ANNEX I HABITATS

- 6.3.1.1. Any site that includes Annex I habitats that is directly affected by the Proposed Development would be screened into assessment along with all its interest features. In this instance, 'directly' means where the Onshore Cable Corridor search area passes through the European site.
- 6.3.1.2. It is expected that works in the onshore environment from the Proposed Development (see section 3.6) will have limited connectivity to any habitats that are not immediately adjacent through a lack of hydrological connectivity and the nature of the construction methodologies applied.
- 6.3.1.3. An element of the onshore cable corridor also crosses the Solent Maritime SAC (Plate 5.2) and there is therefore potential for connectivity. The SAC is a large site that is not fully encompassed by any ZoI from the onshore elements of the Proposed Development. Features that are present below MLWS are fully assessed under Annex I habitats in the marine environment sections see Section 6.2.2.
- 6.3.1.4. Further European sites in the marine and coastal environment that have been identified, include Solent and Isle of Wight Lagoon SAC (6 km from the onshore cable corridor) and South Wight Maritime SAC (8.1 km from the Onshore Cable Corridor). These sites areboth fully considered within the marine environment sections of this HRA see Section 6.2.2.
- 6.3.1.5. Butser Hill SAC lies 5.6 km from the Converter Station Area. This European Site is situated on the east Hampshire chalk which forms part of the South Downs. Much of the site consists of CG2 *Festuca ovina Avenula pratense* grassland. The site has a varied range of slope gradients and aspects which has a strong influence on the vegetation composition. A particular feature of the site is its lower plant assemblage. It has the richest terricolous lichen flora of any chalk grassland site in England, and also supports the distinctive *Scapanietum asperae* or southern hepatic mat association of leafy liverworts and mosses on north-facing chalk slopes. This association is very rare in the UK and Butser Hill supports the largest known example. The site exhibits various transitions between semi-natural dry grassland, chalk heath, mixed scrub and 91J0 *Taxus baccata* woods.
- 6.3.1.6. Considering the distance between the Proposed Development and Butser Hill SAC there is concluded to be no connectivity and no potential for Likely significant effects.

#### 6.3.2. SITES DESIGNATED FOR ANNEX II SPECIES

6.3.2.1. Any site that includes Annex II species that is directly affected by the Proposed Development would be screened into the assessment along with its Annex II species features. On this basis the term 'directly' refers to where the onshore elements of the Proposed Development are within or directly adjacent to the European Site.



- 6.3.2.2. Further consideration is given to Annex II ecological features that are distinctly mobile which therefore have a wider potential for connectivity with the Proposed Development. CIEEM (2016) provides the appropriate guidance for taking into account species distribution and ecology. Areas of search for these species include:
  - Bats Sites within 10km of the onshore elements of the Proposed Development would be screened in to the Assessment; and
  - Otters Sites within 5 km of the onshore elements Proposed Development would be screened into the Assessment.
- 6.3.2.3. No European Site lies within 10 km of the onshore elements of the Proposed Development that supports terrestrial Annex II species.

#### 6.3.3. SITES DESIGNATED FOR ORNITHOLOGICAL FEATURES

- 6.3.3.1. Any European sites that are directly affected by the Proposed Development have been screened into the assessment along with its ornithological features. As with Annex II features, the term 'directly' refers to where to Sites which overlap or are adjacent to the onshore elements of the Proposed Development.
- 6.3.3.2. In addition, sites designated for ornithological features which are located within 10 km of the Proposed Development have also been included for assessment. Foraging range of breeding seabirds (e.g. Thaxter *et al.*, 2012) has not been included as criteria for screening for the onshore element of the Proposed Development due to the limited potential for interaction with onshore works. These criteria are, however, fundamental in determining screening conclusions with regards to the marine components of the Proposed Development (see Section 6.2.5).
- 6.3.3.3. The Proposed Development passes through and borders Chichester and Langstone Harbours SPA and is immediately adjacent to the Solent and Dorset Coast pSPA. As the pSPA is proposed to be desigated for the foarging areas for breeding tern species this is considered to have connectivity with the marine elements of the Proposed Development only. A similar consideration is alos given to features which are ordinarlily present in the marine environment only (i.e. below MLWS) such as redbreasted merganser. These features are fully considered within the marine ornithology sections of this HRA – see Section 6.2.5.
- 6.3.3.4. Table 6-7 provides a summary of sites and ornithological features that lie within 10 km of the onshore elements of the Proposed Development.

Relevant SPA/Ramsar	Distance from SPA/Ramsar to Proposed Development	Features	Potential for LSE?
Chichester and Langstone Harbours SPA/Ramsar <sup>11</sup>	0.0 km, partly overlapping	Sandwich tern (B) Little tern (B) Common tern (B) Pintail (W) Shoveler (W) Wigeon (W) Turnstone (W) Dark-bellied brent goose (W) Sanderling (W) Dunlin (W) Ringed Plover (W) Bar-tailed godwit (W) Red-breasted merganser (W) Curlew (W) Shelduck (W) Redshank (W) Waterfowl assemblage	Yes – onshore elements directly ac merganser is however considered assessment of marine ornithology onshore elements of the Proposed
Solent and Dorset Coast pSPA	0.0 km, adjacent	Sandwich tern (B) Little tern (B) Common tern (B)	No - This site is proposed to prote interest features from colonies with Chichester and Langstone Harbour connectivity with the onshore comp considered to occur.
Portsmouth Harbour SPA/Ramsar	2.2 km	Dark-bellied brent goose (W) Dunlin (W) Black-tailed godwit (W) Red-breasted merganser (W)	Yes – while direct impacts to the S occur outwith the site adjacent to the merganser is considered to be a fe of marine ornithology and no LSE components of the Proposed Deve
Solent and Southampton Water SPA/Ramsar	7.1 km	Teal (W) Dark-bellied brent goose (W) Ringed plover (W) Mediterranean gull (B) Black-tailed godwit (W) Little tern (B) Roseate tern (B) Common tern (B) Sandwich tern (B)	No - although Solent and Dorset of foraging tern species from this SP/ the pSPA area adjacent to the ons Development as detailed in the De England, 2016). With regards winte sufficiently distant so that impacts Development are not considered life

#### Table 6.7 - Potential for LSE on SPA and Ramsar ornithological features from onshore components of the Proposed Development

Key: B – breeding feature; W – wintering feature; P – Passage feature.

<sup>11</sup> Additional species listed on the SPA Review (2001) include Little Egret (P/W), black-tailed godwit (W)



adjacent to the SPA. Red-breasted ed to be a feature of relevance only to the by and no LSE is considered with respect to ed Development.

otect the marine foraging areas of qualifying within adjacent classified SPAs including ours SPA and as such no potential mponents of the Proposed Development are

Site itself are unlikely, features are likely to the Proposed Development. Red-breasted feature of relevance only to the assessment E is considered with respect to onshore evelopment.

coast pSPA features include provision for PA, these are considered not likely to reach nshore element of the Proposed Depratmental Brief for the pSPA (Natural ntering bird features, the SPA/Ramsar is ts from the onshore element of the Proposed I likely.

WSP/Natural Power



#### 6.4. POTENTIAL EFFECTS – MARINE ENVIRONMENT

6.4.1.1. The following sections should be read in conjunction with Appendix 1 (document reference 6.8.3.1) of this report which presents the PINS screening matrices for each site.

#### 6.4.2. ANNEX I HABITATS

- 6.4.2.1. Where there is no connectivity between the Proposed Development and qualifying features of SACs, LSE can be discounted. Features of sites where potential connectivity cannot be discounted have been taken forward to a more detailed LSE screening assessment (see Table 6-3).
- 6.4.2.2. Natural England's Advice on Operations matrix lists a number of pressures for power cables (laying, burial and protection; operation and maintenance; decommissioning) and cables (HDD) in relation to designated sites (Natural England, 2019). Information on potential pressures associated with cabling activities was available from the Natural England Designated Sites View for Advice on Operations for the following European sites:
  - Solent Maritime<sup>12</sup>
  - South Wight Maritime<sup>13</sup>
- 6.4.2.3. Each pressure identified is given a risk level (Medium-High risk or Low risk) and are assessed against each interest feature of a designated site and an interaction type assigned (S Sensitive; IE Insufficient evidence to assess; NA Not assessed; NS Not sensitive at the benchmark).
- 6.4.2.4. For all the UK SACs being considered as part of the LSE screening stage, those pressures (both Medium-High risk or Low risk) for which Annex I habitats have been classed as 'sensitive', 'Insufficient Evidence' or "Not Assessed" have been included in the assessment.
- 6.4.2.5. Given the broad spectrum of pressures itemised on the Advice on Operations matrix in relation to power cables, identified pressures have been categorised into effects which can then be assessed (Table 6-8).

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https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030059&SiteName=sole nt&SiteNameDisplay=Solent+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= Dated 13<sup>th</sup> September 2019

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030061&SiteName=sole nt&SiteNameDisplay=South+Wight+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAAre a= Dated 13<sup>th</sup> September 2019

# Table 6.8 - Predicted effects of the marine elements of the Proposed Development on relevant Annex I habitat Qualifying Features [C = construction phase O = operation phase D = decommissioning phase]

Site	Qualifying Feature	Pressure
Solent	Estuaries	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
Maritime SAC		Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D) Vibration (C, O, D)
		Changes in suspended solids (water clarity) (C, O, D)
		Deoxygenation (C, O, D)
		Nutrient enrichment (C, O, D)
		Organic Enrichment (C, O, D)
		Smothering and siltation rate changes (light) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C, O)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another seabed type) (C, O, D)
		Physical change (to another sediment type) (O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter (C, O, D)
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & Pesticides and Polycyclic Hydrocarbons ('PAH') contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of invasive non-indigenous species ('INIS') (C, O, D)
		Barrier to species movement (O)
		Electromagnetic changes (O)
		Introduction of light (C, O, D)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)
		Wave exposure changes (C, O, D)
		Emergence regime changes, including tidal level change considerations (C, O, D)
	Mudflats and sand	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
	flats not	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D
	submerged at low	Changes in suspended solids (water clarity) (C, O, D)
	tide	Deoxygenation (C, O, D)
		Nutrient enrichment (C, O, D)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Smothering and siltation rate changes (light) (C, O, D)



Effect
Habitat disturbance
Increased Suspended Sediment Concentration (SSC)
Deposition of sediment (smothering)
Resuspension of contaminated sediments Habitat loss
Pollution
Invasive species
Electromagnetic Field (EMF)
Increased light Pollution Temperature changes
Hydrodynamic changes
Habitat disturbance
Increased SSC
Resuspension of contaminated sediments

WSP/Natural Power

Site	Qualifying Feature	Pressure
		Smothering and siltation rate changes (Heavy) (C, O)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another sediment type) (O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter (C, O, D)
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & PAH contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of INIS (C, O, D)
		Electromagnetic changes (O)
		Introduction of light (C, O, D)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)
		Wave exposure changes (C, O, D)
		Emergence regime changes, including tidal level change considerations (C, O, D)
	Sandbanks slightly	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
	covered by	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D)
	seawater all the	Changes in suspended solids (water clarity) (C, O, D)
	time	Nutrient enrichment (C, O, D)
		Smothering and siltation rate changes (light) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C, O)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another seabed type) (C, O, D)
		Physical change (to another sediment type) (O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter (C, O, D)
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & PAH contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of INIS (C, O, D)
		Electromagnetic changes (O)
		Introduction of light (C, O, D)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)



### Effect Deposition of sediment (smothering) Habitat loss Pollution Invasive species EMF Increased light Pollution Temperature changes Hydrodynamic changes Habitat disturbance Increased SSC Deposition of sediment (smothering) Resuspension of contaminated sediments Habitat loss Pollution Invasive species EMF Increased light pollution Temperature changes Hydrodynamic changes

WSP/Natural Power

Site	Qualifying Feature	Pressure
		Wave exposure changes (C, O, D)
		Emergence regime changes, including tidal level change considerations (C, O, D)
	Spartina swards	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
		Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D) Vibration (C)
		Changes in suspended solids (water clarity) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C, O)
		Shoulening and situation rate changes (neavy) (C, O)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another sediment type) (C, O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter (C, O, D)
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & PAH contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of INIS (C, O, D)
		Barrier to species movement (O)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Emergence Regime Changes (C, O, D)
	Atlantic salt	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
	meadows	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D) Vibration (C)
		Changes in suspended solids (water clarity) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C, O)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another sediment type) (C, O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter (C, O, D)
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & PAH contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of INIS (C, O, D)



Effect
Habitat disturbance
Increased SSC Deposition of sediment (smothering)
Resuspension of contaminated sediments Habitat loss
Pollution
Invasive species EMF
Temperature changes
Hydrodynamic changes Habitat disturbance
Increased SSC Deposition of sediment (smothering)
Resuspension of contaminated sediments Habitat loss
Pollution
Invasive species

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Site	Qualifying Feature	Pressure
		Barrier to species movement (O)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Emergence Regime Changes (C, O, D)
	Salicornia and	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
	other annuals	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D)
	colonising mud and	Vibration (C)
	sand	Changes in suspended solids (water clarity) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C, O)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another sediment type) (C, O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter (C, O, D)
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & PAH contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of INIS (C, O, D)
		Barrier to species movement (O)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Emergence Regime Changes (C, O, D)
South Wight	Reefs	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
Maritime		Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D)
		Changes in suspended solids (water clarity) (C, O, D)
		Deoxygenation (C, O, D)
		Nutrient enrichment (C, O, D)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Smothering and siltation rate changes (light) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C, O)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another seabed type) (C, O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter



EMF         Temperature changes         Hydrodynamic changes         Habitat disturbance         Habitat disturbance         Increased SSC         Deposition of sediment (smothering)         Resuspension of contaminated sediments         Habitat loss         Pollution
Hydrodynamic changes Habitat disturbance Increased SSC Deposition of sediment (smothering) Resuspension of contaminated sediments Habitat loss
Habitat disturbance Increased SSC Deposition of sediment (smothering) Resuspension of contaminated sediments Habitat loss
Increased SSC Deposition of sediment (smothering) Resuspension of contaminated sediments Habitat loss
Deposition of sediment (smothering) Resuspension of contaminated sediments Habitat loss
(smothering)Resuspensionofcontaminated sedimentsHabitat loss
contaminated sediments Habitat loss
Pollution
Invasive species
EMF
Temperature changes
Hydrodynamic changes
Habitat disturbance
Increased SSC
Resuspension of contaminated sediments
Deposition of sediments (smothering)
Habitat loss
Pollution

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Site	Qualifying Feature	Pressure
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & PAH contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of INIS (C, O, D)
		Underwater noise changes (C, O, D)
		Barrier to species movement (O)
		Electromagnetic changes (O)
		Introduction of light (C, O, D)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)
		Emergence Regime Changes (C, O, D)
		Wave exposure changes (C, O, D)
	Submerged or	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
	partially	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D)
	submerged sea caves	Changes in suspended solids (water clarity) (C, O, D)
		Deoxygenation (C, O, D)
		Nutrient enrichment (C, O, D)
		Smothering and siltation rate changes (light) (C, O, D)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Habitat structure changes - removal of substratum (extraction) (C, D)
		Physical change (to another seabed type) (C, O, D)
		Physical loss (to land or freshwater habitat) (C, O)
		Litter
		Introduction of other substances (solid, liquid or gas) (C, O, D)
		Hydrocarbon & PAH contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction or spread of INIS (C, O, D)
		Electromagnetic changes (O)
		Introduction of light (C, O, D)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)
		Emergence Regime Changes (C, O, D)



#### Effect

Invasive species Noise and vibration EMF

Increased light Pollution Temperature changes

Hydrodynamic changes

Habitat disturbance

Increased SSC

Deposition of sediment (smothering) Resuspension of contaminated sediments Habitat loss

Pollution

Invasive species

EMF

Increased light Pollution Temperature changes

Hydrodynamic changes

WSP/Natural Power



#### 6.4.3. ANNEX II DIADRAMOUS MIGRATORY FISH

- 6.4.3.1. Natural England's Advice on Operations matrix lists a number of pressures for power cables (laying, burial and protection; operation and maintenance; decommissioning) and cables (HDD) in relation to designated sites (Natural England, 2019).
- 6.4.3.2. These pressures are given a risk level (low or Medium-High Risk) and are assessed against each interest feature of a designated site.
- 6.4.3.3. Those pressures for which Annex II diadromous fish species have been classed as 'sensitive', 'Insufficient Evidence' or 'N/A' have been included in the effects assessed for each of the SACs being considered as part of the LSE screening stage.
- 6.4.3.4. Given the broad spectrum of pressures itemised on the Advice on Operations matrix in relation to power cables and HDD they have then been categorised into effects which can then be assessed (Table 6.9). Where possible effects will reflect those identified in the Chapter 9 Fish and Shellfish of the ES (document reference 6.1.9) for the Proposed Development.
- 6.4.3.5. It should be noted that not all the designated sites listed in Table 6-9 have an Advice on Operations matrix. Where this occurs a different designated site (proxy site) with the same Annex II diadromous fish species has been selected and using the same operations (power cable and HDD), the pressures and sensitivities have been recorded. Proxy sites used are defined in Table 6-9. In addition, where no proxy site is available for a specific species (e.g. salmon) the pressures for a comparable species (e.g. shad) have been used.
- 6.4.3.6. Although the potential effect of habitat loss is included in Table 6-9 it only relates to the loss of habitat from within a European site. Those SACs which list Annex II diadromous migratory fish are located outside the Proposed Development (nearest site is 27.5 km away) therefore there is no pathway for this effect to occur. As such, this effect will not be considered further in the determination of LSE.
- 6.4.3.7. Information on potential pressures associated with cabling activities was available from the Natural England Designated Sites View for Advice on Operations for Plymouth Sound and Estuaries SAC<sup>14</sup>
- 6.4.3.8. Designated sites where no Advice on Operations were available and a proxy site has been used are as follows:
  - River Itchen SAC<sup>15</sup>

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https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: October 2019}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: October 2019}



- River Avon SAC<sup>16,17</sup>
- River Axe SAC<sup>18</sup>
- Baie de Canche et Couloir des trois Estuaires ZSC<sup>19,20</sup>
- Baie de Seine Orientale ZSC<sup>21,22</sup>
- Littoral Cauchois ZSC<sup>23,24</sup>
- Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC<sup>25,26</sup>

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https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea=&NumMarineSeasonality=8 (Accessed: October 2019)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: October 2019}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea=&NumMarineSeasonality=8 (Accessed: October 2019)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea=&NumMarineSeasonality=8 (Accessed: October 2019)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: October 2019}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea=&NumMarineSeasonality=8 (Accessed: October 2019)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: October 2019}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea=&NumMarineSeasonality=8 (Accessed: October 2019)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: October 2019}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber%20estuary&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea=&NumMarineSeasonality=8 (Accessed: October 2019)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: October 2019}

Qualifying Feature	Site	Pressure	Effect
Salmon	River Itchen SAC*	Changes in suspended solids (water clarity) (C, O, D)	Increased SSC
	River Avon SAC* Baie de Canche et Couloir des trois Estuaires ZSC* Baie de Seine Orientale ZSC*	Deoxygenation (C, O, D)	
		Collision below water with static or moving objects not naturally found in the marine environment (C, O, D)	Physical injury
		Habitat structure changes - removal of substratum (extraction) (C, D)	Habitat loss
		Introduction or spread of INIS (C, O, D)	Invasive species
		Hydrocarbon and PAH contamination (C, O, D) Litter (C, O, D)	Pollution events
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)	
		Introduction of other substances (solid, liquid or gas) (C)	
		Transition elements & organo-metal (e.g. TBT) contamination (C)	
		Underwater noise changes (C, O, D)	Noise and vibration
		Vibration (C, O, D)	
		Visual Disturbance (C, O, D)	Visual disturbance
		Barrier to species movement (O)	EMF
		Electromagnetic changes (O)	
		Temperature decrease (O)	Temperature changes
		Temperature increase (O)	
Allis Shad	Plymouth Sound and Estuaries SAC Baie de Canche et Couloir des trois Estuaires ZSC* Baie de Seine Orientale ZSC*	Changes in suspended solids (water clarity) (C, O, D)	Increased SSC
		Deoxygenation (C, O, D)	
		Collision below water with static or moving objects not naturally found in the marine environment (C, O, D)	Physical injury
		Habitat structure changes - removal of substratum (extraction) (C, D)	Habitat loss
		Introduction or spread of INIS (C, O, D)	Invasive species
		Hydrocarbon and PAH contamination (C, O, D)	Pollution events
		Litter (C, O, D)	
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)	
		Introduction of other substances (solid, liquid or gas) (C)	
		Transition elements & organo-metal (e.g. TBT) contamination (C)	
		Underwater noise changes (C, O, D)	Noise and vibration
		Vibration (C, O, D)	1
		Visual Disturbance (C, O, D)	Visual disturbance
		Barrier to species movement (O)	EMF
		Electromagnetic changes (O)	
		Temperature decrease (O)	Temperature changes
		Temperature increase (O)	

#### Table 6.9 - Predicted effects of the marine elements of the Proposed Development on relevant Annex II Migratory Fish Qualifying Features



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Qualifying Feature	Site	Pressure	Effect
Twaite Shad	Littoral Cauchois ZSC*	Changes in suspended solids (water clarity) (C, O, D)	Increased SSC
	Baie de Seine Orientale ZSC*	Deoxygenation (C, O, D)	
		Collision below water with static or moving objects not naturally found in the marine environment (C, O, D)	Physical injury
		Habitat structure changes - removal of substratum (extraction) (C, D)	Habitat loss
		Introduction or spread of INIS (C, O, D)	Invasive species
		Hydrocarbon and PAH contamination (C, O, D)	Pollution events
		Litter (C, O, D) Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)	
		Introduction of other substances (solid, liquid or gas) (C)	
		Transition elements & organo-metal (e.g. TBT) contamination (C)	
		Underwater noise changes (C, O, D)	Noise and vibration
		Vibration (C, O, D)	
		Visual Disturbance (C, O, D)	Visual disturbance
		Barrier to species movement (O)	EMF
		Electromagnetic changes (O)	
		Temperature decrease (O)	Temperature changes
		Temperature increase (O)	
Sea lamprey	River Avon SAC** River Axe SAC** Littoral Cauchois ZSC** Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC** Baie de Canche et Couloir des trois Estuaires ZSC** Baie de Seine Orientale ZSC**	Deoxygenation (C, O, D)	Increased SSC
		Collision below water with static or moving objects not naturally found in the marine environment (C, O, D)	Physical injury
		Habitat structure changes - removal of substratum (extraction) (C, D)	Habitat loss
		Introduction or spread of INIS (C, O, D)	Invasive species
		Hydrocarbon & PAH contamination (C, O, D)	Pollution events
		Litter (C, O, D)	
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals (C, O, D)	
		Introduction of other substances (solid, liquid or gas) (C)	
		Transition elements & organo-metal (e.g. TBT) contamination (C) (D)	
		Underwater noise changes (C, O, D)	Noise and vibration
		Vibration (C, O, D)	
		Barrier to species movement (O)	EMF
		Electromagnetic changes (O)	
		Temperature decrease (O)	Temperature changes
		Temperature increase (O)	
River Lamprey	Littoral Cauchois ZSC**	Deoxygenation (C, O, D)	Increased SSC
	Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC**	Collision below water with static or moving objects not naturally found in the marine environment (C, O, D)	Physical injury
		Habitat structure changes - removal of substratum (extraction) (C, D)	Habitat loss



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Qualifying Feature	Site	Pressure	Effect
	Baie de Canche et Couloir des trois	Introduction or spread of INIS (C, O, D)	Invasive species
	Estuaires ZSC**	Hydrocarbon & PAH contamination (C, O, D)	Pollution events
	Baie de Seine Orientale ZSC**	Litter (C, O, D)	
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals (C, O, D)	
		Introduction of other substances (solid, liquid or gas) (C)	
		Transition elements & organo-metal (e.g. TBT) contamination (C) (D)	
		Underwater noise changes (C, O, D)	Noise and vibration
		Vibration (C, O, D)	
		Barrier to species movement (O)	EMF
		Electromagnetic changes (O)	
		Temperature decrease (O)	Temperature changes
		Temperature increase (O)	

\* - Plymouth sound and estuary SAC used as proxy due to unavailability of advice on operation information for site.

\*\*- Humber estuary SAC used as proxy due to unavailability of advice on operation information for site.

C = construction phase, O = operation phase, D = decommissioning phase



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#### 6.4.4. MARINE MAMMALS

- 6.4.4.1. All the UK SACs for marine mammals were pre-screened out within Section 6.2.
- 6.4.4.2. For the French ZSCs/Ramsars, the 'documents d'objectifs'/site management plans were accessed (where they existed). However, equivalent activities/pressures information to that available for UK SACs was not presented within these documents. Therefore, the potential for LSE on the marine mammal features of the French ZSCs/Ramsars was assessed using the more detailed Advice on Operations information from UK SACs for the same marine mammal qualifying features.
- 6.4.4.3. Both low and medium-high risk pressures were considered. Pressures which were not assessed (NA) or for which there was insufficient evidence (IE) of feature sensitivity were also considered in addition to those pressures for which the evidence base suggests the feature is sensitive (S).
- 6.4.4.4. Pressures relating to the supporting habitats<sup>27</sup> of the marine mammal species (both UK and French sites) were not considered because the Proposed Development is too far for there to be any potential effect on the supporting habitats within the sites.
- 6.4.4.5. The pressures were grouped by effect type (see Table 6-10 below) and have been presented in the assessment of LSE (Section 7) and PINS matrices (Appendix 1, document reference 6.8.3.1) as:
  - Auditory injury;
  - Disturbance;
  - Collision;
  - Indirect effects; and
  - Pollution.
- 6.4.4.6. Although no pressures which may lead to either auditory injury or pollution were listed for either bottlenose dolphin (information taken from the Conservation Objectives and Advice on Operations document for the Cardigan Bay SAC) or grey seal (information taken from the Conservation Objectives and Advice on Operations document for the Pembrokeshire Marine SAC), the potential for LSE as a result of both auditory injury and pollution was assessed for sites where these species are features.

<sup>&</sup>lt;sup>27</sup> The supporting habitats for marine mammals are considered to be coastal lagoons, intertidal coarse sediment, intertidal mixed sediments, intertidal mud, intertidal sand and muddy sand and water column as per the Advice on Operations for cables for The Wash and North Norfolk Coast SAC (<u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0017075&SiteName=the</u>+wash&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=& <u>SeaArea=&IFCAArea</u>) [accessed 18/06/2019]. During consultation, Natural England requested that the supporting habitat 'water column' be considered for UK SACs.

Features	Site	Pressure	Effect
ottlenose dolphin <sup>28</sup>	Estuaires et littoral picards (baies de Somme et d'Authie) ZSC	No pressures listed	Auditory injury
	Littoral Cauchois ZSC	Physical disturbance: displacement, visual, noise	Disturbance
	Baie de Seine orientale ZSC	Potential electro-magnetic effects of electrical cables (operational phase only)	
		Physical disturbance: collision, noise, visual	
		Physical disturbance: collision, noise, visual	Collision
		Geophysical regime: addition of artificial substrate; local modification of water movement	Indirect effects
		Geophysical regime: vessel wash - substrate erosion, local modification of wave exposure regime	
		Scour effect on benthic habitats from cables due to wave action	
		Fundamental environmental parameters: turbidity	
		No pressures listed	Pollution
Harbour porpoise <sup>29</sup>	Récifs Gris-Nez Blanc-Nez ZSC	Anthropogenic underwater sound - mortality, internal injury, disturbance leading to physical and acoustic behavioural changes (potentially impacting foraging, navigation, breeding, socialising), habitat change/loss	Auditory injury
	Ridens et dunes hydrauliques du détroit du		
	Pas-de-Calais ZSC	Anthropogenic underwater sound - mortality, internal injury, disturbance leading to physical and acoustic behavioural changes (potentially impacting foraging,	Disturbance
	Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme	navigation, breeding, socialising), habitat change/loss	
		Death or injury by collision - mortality, injury	Collision
	et d'Authie) ZSC	Anthropogenic underwater sound - mortality, internal injury, disturbance leading to physical and acoustic behavioural changes (potentially impacting foraging,	Indirect effects
	Littoral Cauchois ZSC	navigation, breeding, socialising), habitat change/loss	
	Baie de Seine orientale ZSC	Contaminants - effects on water and prey quality, bioaccumulation through contaminated prey ingestion, health issues (e.g. on reproduction)	Pollution
	Estuaire de la Seine ZSC	ן נטרוגמרוורומובע דובץ וווקבטוטוו, וובמונד ושטעבע (E.g. טון ובדוטטטטוטוו)	

### Table 6.10 - Pressures listed for the different UK SACs and the corresponding effects which were assessed for all marine mammal sites. The pressures relate to all phases of the project (i.e. construction operation and decommissioning) unless otherwise stated



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<sup>&</sup>lt;sup>28</sup> Information on pressures for the relevant activities (considered to be Power/communication cables; Shipping: vessel traffic) taken from Table 3 of the Cardigan Bay SAC document (https://cdn.naturalresources.wales/media/687993/eng-cardigan-bay-reg-37-report-2018.pdf?mode=pad&rnd=131929023330000000).

<sup>&</sup>lt;sup>29</sup> Information on pressures for the relevant activities (considered to be Discharge/run-off from landfill, terrestrial/offshore industries; Shipping; Dredging and disposal; Geophysical surveys) taken from Table 2 and Table A1 of the Southern North Sea SAC Conservation Advice and Advice on Operations document (http://incc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf).

Features	Site	Pressure	Effect
Grey seal <sup>30</sup>	Récifs Gris-Nez Blanc-Nez ZSC	No pressures listed	Auditory injury
	Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC	<ul><li>Physical disturbance: displacement, visual, noise</li><li>Potential electro-magnetic effects of electrical cables (operational phase only)</li><li>Physical disturbance: collision, noise, visual</li></ul>	Disturbance
	Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar	Physical disturbance: collision, noise, visual	Collision
	Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Geophysical regime: addition of artificial substrate; local modification of water movement Geophysical regime: vessel wash - substrate erosion, local modification of wave exposure regime Fundamental environmental parameters: turbidity	Indirect effects
		No pressures listed	Pollution
Harbour seal <sup>31</sup>	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC	Underwater noise changes Vibration	Auditory injury
	<ul> <li>Baie de Canche et couloir des trois estuaires ZSC</li> <li>Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar</li> <li>Littoral Cauchois ZSC</li> <li>Baie de Seine orientale ZSC</li> <li>Estuaire de la Seine ZSC</li> </ul>	Above water noiseIntroduction of lightUnderwater noise changesVibrationVisual disturbanceBarrier to species movement (operational phase only for power cables, construction phase only for HDD)	Disturbance
		Collision below water with static or moving objects not naturally found in the marine environment	Collision

 <sup>30</sup> Information on pressures for the relevant activities (considered to be Power/communication cables; Shipping: vessel traffic (commercial)) taken from Table 3 of the Pembrokeshire Marine SAC document (<u>https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-2018.pdf?mode=pad&rnd=13192902498000000</u>).
 <sup>31</sup> Information on pressures for the relevant activities (considered to be Cables – Power cable: Laying, burial and protection; Cables – Power cable: Operation and maintenance; Cables – Power cable: Decommissioning; Cables – Cables: HDD) taken from the Advice on Operations page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC (<u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0017075&SiteName=the%20wash&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea).
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Site	Pressure	Effect
	Introduction or spread of INIS	Indirect effects
	Hydrocarbon and PAH contamination	Pollution
	Litter	
	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	
	Transition elements and organo-metal (e.g. TBT) contamination	
	Introduction of other substances (solid, liquid or gas)	
	Site	Introduction or spread of INIS Hydrocarbon and PAH contamination Litter Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) Transition elements and organo-metal (e.g. TBT) contamination





#### 6.4.5. MARINE ORNITHOLOGY

- 6.4.5.1. Information on potential pressures associated with cabling activities was available from the Natural England Designated Sites View for Advice on Operations for the following European sites:
  - Chichester and Langstone Harbours SPA<sup>32</sup>;
  - Portsmouth Harbour SPA<sup>33</sup>:
  - Solent and Southampton Water SPA<sup>34</sup>; and
  - Pagham Harbour SPA<sup>35</sup>.
- 6.4.5.2. Potential pressures identified for these European sites were applied to those features of European sites where Advice on Operations was not available. This approach was applied to:
  - Solent and Dorset Coast pSPA;
  - Alderney West Coast and Burhou Islands Ramsar; and
  - Littoral Seino-Marin ZPS.
- 6.4.5.3. Cabling activities considered included:
  - Cables Cables: HDD;
  - Cables Power cable: Laying, burial and protection; ٠
  - Cables Power cable: Operation and maintenance; and •
  - Cables Power cable: Decommissioning.
- 6.4.5.4. Both low and medium-high risk pressures were considered, including those pressures for which the evidence base suggests that a feature may be sensitive (S), as well as those pressures for which there was insufficient evidence (IE) or where the presure was not assessed (NA) for feature sensitivity. For transboundary sites, feature sensitivity (interaction type) was not available.

<sup>&</sup>lt;sup>32</sup>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011011&SiteName=chi chester&SiteNameDisplay=Chichester+and+Langstone+Harbours+SPA&countyCode=&responsiblePerson=& SeaArea=&IFCAArea= (Accessed October 2019)

<sup>&</sup>lt;sup>33</sup><u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011051&SiteName=Po</u> rtsmouth+Harbour&SiteNameDisplay=Portsmouth+Harbour+SPA&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea= (Accessed October 2019)

<sup>&</sup>lt;sup>34</sup><u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011061&SiteName=sol</u> ent+&SiteNameDisplay=Solent+and+Southampton+Water+SPA&countyCode=&responsiblePerson=&SeaAre a=&IFCAArea= (Accessed October 2019)

<sup>&</sup>lt;sup>35</sup>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9012041&SiteName=pa gham&SiteNameDisplay=Pagham+Harbour+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea

<sup>= (</sup>Accessed October 2019)



6.4.5.5. Given the broad spectrum of pressures identified (see Table 6-11), pressures were grouped into those effects identified in the Chapter 11 Marine Ornithology of the ES (document reference 6.1.11) for the Proposed Development.

Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
Solent and Dorset Coast pSPA	0.0 km	Above water noise	Disturbance and displacement	Sandwich tern Common tern Little tern
		Underwater noise		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Visual disturbance		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Introduction of light		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Vibration		Supporting habitat (water column)
		Collision above water with static or moving objects	Collision*	Sandwich tern Common tern Little tern
		Collision below water with static or moving objects		Sandwich tern Common tern Little tern
		Changes in suspended solids (water clarity)	Indirect effects	Sandwich tern Common tern Little tern Supporting habitat (water column)
		Deoxygenation		Supporting habitat (water column)
		Nutrient enrichment		Supporting habitat (water column)
		Habitat structure changes – removal of substratum		Supporting habitat (water column)
		Physical loss (to land or freshwater		Supporting habitat (water column)
		Water flow (tidal current) changes, including sediment transport considerations		Sandwich tern Common tern Little tern

### Table 6.11 - Potential effects on marine ornithology features across all phases of the Proposed Development

AQUIND INTERCONNECTOR PINS Ref.: EN020022 Document Ref: Habitats Regulation Assessment Report AQUIND Limited



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Emergence regime changes, including tidal level change considerations	Accidental spills	Supporting habitat (water column) Sandwich tern Common tern Little tern Supporting habitat (water column)
		Transition elements and organometal contamination		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Hydrocarbon and Polycyclic Aromatic Hydrocarbon ('PAH') contaminants		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Litter	Litter	Sandwich tern Common tern Little tern Supporting habitat (water column)
		Introduction or spread of INIS	INIS	Sandwich tern Common tern Little tern Supporting habitat (water column)
Chichester and Langstone Harbours SPA/Ramsar site	0.1 km	Visual disturbance	Disturbance and displacement	Red-breasted merganser Sandwich tern Common tern Little tern Supporting habitat (water column)
		Above water noise		Red-breasted merganser Sandwich tern Common tern Little tern



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Underwater noise changes		Sandwich tern Common tern Little tern Red-breasted merganser Supporting habitat (water column)
		Introduction of light		Sandwich tern Common tern Little tern Red-breasted merganser Supporting habitat (water column)
		Vibration		Supporting habitat (water column)
		Collision above water with static or moving objects	Collision*	Red-breasted merganser Sandwich tern Common tern Little tern
		Collision below water with static or moving objects		Red-breasted merganser Sandwich tern Common tern Little tern
		Changes in suspended solids (water clarity)	Indirect effects	Red-breasted merganser Sandwich tern Common tern Little tern Supporting habitat (water column)
		Deoxygenation		Supporting habitat (water column)
		Nutrient enrichment		Supporting habitat (water column)
		Habitat structure changes – removal of substratum		Supporting habitat (water column)
		Physical loss (to land or freshwater	1	Supporting habitat (water column)
		Water flow (tidal current) changes, including sediment transport considerations		Red-breasted merganser Sandwich tern Common tern Little tern Supporting habitat (water column)



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Emergence regime changes, including tidal level change considerations		Red-breasted merganser Sandwich tern Common tern Little tern Supporting habitat (water column)
		Transition elements and organometal contamination		Red-breasted merganser Sandwich tern Common tern Little tern Supporting habitat (water column)
		Hydrocarbon and PAH contaminants	Accidental spills	Red-breasted merganser Sandwich tern Common tern Little tern
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Red-breasted merganser Sandwich tern Common tern Little tern Supporting habitat (water column)
		Litter	Litter	Red-breasted merganser Sandwich tern Common tern Little tern Supporting habitat (water column)
		Introduction or spread of INIS	INIS**	Sandwich tern Common tern Little tern Supporting habitat (water column)
Portsmouth Harbour SPA/Ramsar site	4.9 km	Visual disturbance	Disturbance and displacement	Red-breasted merganser Supporting habitat (water column)
		Above water noise Underwater noise		Red-breasted merganser Red-breasted merganser Supporting habitat (water column)
		Introduction of light		Red-breasted merganser Supporting habitat (water column)



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features	
		Vibration		Supporting habitat (water column)	
		Collision above water with static or moving objects	Collision*	Red-breasted merganser	
		Collision below water with static or moving objects		Red-breasted merganser	
		Changes in suspended solids (water clarity)	Indirect effects	Red-breasted merganser Supporting habitat (water column)	
		Deoxygenation		Supporting habitat (water column)	
		Nutrient enrichment		Supporting habitat (water column)	
		Habitat structure changes – removal of substratum		Supporting habitat (water column)	
		Physical loss (to land or freshwater		Supporting habitat (water column)	
		Water flow (tidal current) changes, including sediment transport considerations		Red-breasted merganser Supporting habitat (water column)	
				Emergence regime changes, including tidal level change considerations	
		Transition elements and organometal contamination		Red-breasted merganser Supporting habitat (water column)	
			Hydrocarbon and PAH contaminants	Accidental spills	Red-breasted merganser Supporting habitat (water column)
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Red-breasted merganser Supporting habitat (water column)	
		Litter	Litter	Red-breasted merganser Supporting habitat (water column)	
		Introduction or spread of INIS	INIS**	Supporting habitat (water column)	
Solent and Southampton Water SPA/Ramsar site	6.6 km	Above water noise	Disturbance and displacement	Sandwich tern Common tern Roseate tern Little tern	



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
				Mediterranean gull
		Underwater noise		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Visual disturbance		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Introduction of light		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Vibration		Supporting habitat (water column)
		Collision above water with static or moving objects	Collision*	Sandwich tern Common tern Roseate tern Little tern Mediterranean gull
		Collision below water with static or moving objects		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull
		Changes in suspended solids (water clarity)	Indirect effects	Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Deoxygenation		Supporting habitat (water column)



Transboundary site interaction
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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Nutrient enrichment		Supporting habitat (water column)
		Habitat structure changes – removal of substratum		Supporting habitat (water column)
		Physical loss (to land or freshwater		Supporting habitat (water column)
		Water flow (tidal current) changes, including sediment transport considerations		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Emergence regime changes, including tidal level change considerations		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Transition elements and organometal contamination		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Hydrocarbon and PAH contaminants	Accidental spills	Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)



Transboundary site interaction
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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Litter	Litter	Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Introduction or spread of INIS	INIS	Sandwich tern Common tern Roseate tern Little tern Mediterranean gullSupporting habitat (water column)
Pagham Harbour	9.5 km	Above water noise	Disturbance and	Common tern
SPA/Ramsar site	PĀ/Ramsar site	Underwater noise	displacement	Common tern Supporting habitat (water column)
		Visual disturbance		Common tern Supporting habitat (water column)
		Introduction of light		Common tern Supporting habitat (water column)
		Vibration		Supporting habitat (water column)
		Collision above water with static or moving objects	Collision*	Common tern
		Collision below water with static or moving objects		Common tern
		Changes in suspended solids (water clarity)	Indirect effects	Common tern Supporting habitat (water column)
		Deoxygenation		Supporting habitat (water column)
		Nutrient enrichment		Supporting habitat (water column)
		Habitat structure changes – removal of substratum		Supporting habitat (water column)
		Physical loss (to land or freshwater		Supporting habitat (water column)
		Water flow (tidal current) changes, including sediment transport considerations		Common tern Supporting habitat (water column)



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Emergence regime changes, including tidal level change considerations Transition elements and		Common tern Supporting habitat (water column) Common tern
		organometal contamination		Supporting habitat (water column)
		Hydrocarbon and PAH contaminants	Accidental spills	Common tern Supporting habitat (water column)
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Common tern Supporting habitat (water column)
		Litter	Litter	Common tern Supporting habitat (water column)
		Introduction or spread of INIS	INIS	Common tern Supporting habitat (water column)
Littoral Seino-Marin SPA	30.6 km	Above water noise	Disturbance and displacement	-
		Visual disturbance		-
		Underwater noise		-
		Introduction of light		-
		Collision above water with static or moving objects	Collision	-
		Collision below water with static or moving objects		-



Transboundary site interaction	
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Fulmar Great black-backed gull Herring gull Kittiwake	

Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Changes in suspended solids (water clarity)	Indirect effects	-
		Water flow (tidal current) changes, including sediment transport considerations		-
		Emergence regime changes, including tidal level change considerations		-
		Transition elements and organometal contamination		-
		Hydrocarbon and PAH contaminants	Accidental spills	-
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		-
		Litter	Litter	-
		Introduction or spread of INIS	INIS	-
Alderney West Coast and Burhou Islands Ramsar	142.0 km	Above water noise	Disturbance and displacement	-
		Visual disturbance		-
		Underwater noise		-
		Introduction of light		-



## Transboundary site interaction

Fulmar Great black-backed gull Herring gull Kittiwake
Fulmar Great black-backed gull Herring gull Kittiwake
Gannet Storm petrel Lesser black-backed gull
Gannet Storm petrel Lesser black-backed gull
Gannet Storm petrel Lesser black-backed gull
Gannet Storm petrel

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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Collision above water with static or moving objects	Collision	-
		Collision below water with static or moving objects		-
		Changes in suspended solids (water clarity)	Indirect effects	-
		Water flow (tidal current) changes, including sediment transport considerations		-
		Emergence regime changes, including tidal level change considerations		-
		Transition elements and organometal contamination		-
		Hydrocarbon and PAH contaminants	Accidental spills	-
		Synthetic compound contamination (incl. pesticides, antifoulants, Pharmaceuticals)		-
		Litter	Litter	-
		Introduction or spread of INIS	INIS	-

Key: \* Collision not identified as a pressure-effect interaction for supporting habitat (water column) in Natural England Advice on Operations; \*\* INIS not identified interaction for red-breasted merganser in Natural England Advice on Operations.



## Transboundary site interaction

	Lesser black-backed gull
	Gannet
	Storm petrel
	Lesser black-backed gull
	Gannet Storm petrel
	Lesser black-backed gull
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	Gannet Storm petrel
	Lesser black-backed gull
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a	as a pressure-effect

WSP/Natural Power



### 6.5. POTENTIAL EFFECTS – ONSHORE ENVIRONMENT

- 6.5.1.1. A number of environmental impacts have been identified and assessed in Chapter 16 of the ES (Onshore Ecology) for the Proposed Development. These have been reviewed alongside information on potential pressures and threats on features of relvantd designated sites in order to determine a list of potential effects for the purposes of HRA. Details on potential pressures and threats are available from Natural England Designated Sites View for Advice on Operations for the following European sites:
  - Chichester and Langstone Harbours SPA<sup>36</sup>; and
  - Portsmouth Harbour SPA<sup>37</sup>;
- 6.5.1.2. In line with the listed pressures with respect to the marine environment, pressures are grouped into those effects identified in Chapter 16 (Onshore Ecology) of the ES for the Proposed Development, (Table 6-12).
- 6.5.1.3. Table 6-12 considers both low and medium-high risk pressures, including those pressures for which the evidence base suggests that a feature may be sensitive (S), as well as those pressures for which there was insufficient evidence (IE) or where the presure was not assessed (NA) for feature sensitivity.
- 6.5.1.4. There are considered to be limited pathways for impacts on supporting habitats of relevant European sites to occur as a result of any activity from onshore elements of the Proposed Development. However, Table 6-12 identifies supporting habitats for relevant sites where low and medium-hgh risk presuures are noted within Natural Englands Designated Sites View for Advice on Operations. Supporting habitats within Table 6-12 are not identified individually.

<sup>&</sup>lt;sup>36</sup><u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011011&SiteName=chi</u> <u>chester&SiteNameDisplay=Chichester+and+Langstone+Harbours+SPA&countyCode=&responsiblePerson=&</u> <u>SeaArea=&IFCAArea</u>= (Accessed July 2019)

<sup>&</sup>lt;sup>37</sup><u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011051&SiteName=Portsmouth+Harbour&SiteNameDisplay=Portsmouth+Harbour+SPA&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea= (Accessed July 2019)</u>

Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
Chichester and Langstone Harbours SPA/Ramsar site	0.1 km	Visual disturbance	Disturbance and displacement	Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Curlew Shelduck Redshank
		Noise disturbance		Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Curlew Shelduck Redshank
		Introduction of light		Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone

### Table 6.12 - Potential effects on onshore ecology across all phases of the Proposed Development



Transboundary site interaction
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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
				Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Curlew Shelduck Redshank Supporting habitat
		Habitat structure changes – removal of substratum	Indirect effects	Supporting habitat
		Physical loss (to land or freshwater		Supporting habitat
		Transition elements and organometal contamination		Supporting habitat
		Hydrocarbon and PAH contaminants	Accidental spills	Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Curlew Shelduck Redshank Supporting habitat
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling

AQUIND INTERCONNECTOR PINS Ref.: EN020022 Document Ref: Habitats Regulation Assessment Report AQUIND Limited



## Transboundary site interaction

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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
				Dunlin Grey plover Ringed Plover Bar-tailed godwit Curlew Shelduck Redshank Supporting habitat
		Litter	Litter	Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Curlew Shelduck Redshank Supporting habitat
		Introduction or spread of INIS	INIS**	Sandwich tern Little tern Common tern Pintail Wigeon Turnstone Dark-bellied brent goose Dunlin Grey plover Shelduck Redshank Supporting habitat
Portsmouth Harbour SPA/Ramsar site	4.9 km	Visual disturbance	Disturbance and displacement	Dark-bellied brent goose Dunlin Black-tailed godwit



Transboundary site interaction	
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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Noise disturbance		Dark-bellied brent goose Dunlin Black-tailed godwit
		Introduction of light		Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat
		Habitat structure changes – removal of substratum	Indirect effects	Supporting habitat
		Physical loss (to land or freshwater		Supporting habitat
		Transition elements and organometal contamination		Supporting habitat
		Hydrocarbon and PAH contaminants	Accidental spills	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat
		Litter	Litter	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat
		Introduction or spread of INIS	INIS**	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat



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# 7. DETERMINATION OF LIKELY

## SIGNIFICANT EFFECTS

### 7.1. OVERVIEW

- 7.1.1.1. Following the initial pre-screening stage, more detailed information can be used to assess the LSE on the sites and features screened in for further assessment in Section 6.
- 7.1.1.2. Assessments are undertaken using the PINS screening matrices presented in Appendix 1 (document reference 6.8.3.1) which present assessment of likely effects on site features from the Proposed Development alone and in combination with other projects (see Section 8).
- 7.1.1.3. The following assessments utilise information presented in Section 4 and Section 5 and the ES to determine whether no LSE can be concluded on the European sites and features.
- 7.1.1.4. Where it was not possible to determine no LSE on a designated site, they have been considered further as part of the AA (Section 10).

### 7.2. ASSESSMENT OF LSE – MARINE ENVIRONMENT

### 7.2.1. ANNEX I HABITATS

7.2.1.1. An assessment of LSE on designated marine Annex I habitat features during the construction, operation and decommissioning phases of the Proposed Development is provided in Table 7-1.

SAC	Effect	Feature	LSE?	Justification
Solent Maritime	Habitat disturbance	Estuaries [1130]	N	Only habitats located within the Marine Cable Corridor will a result of direct impacts from construction activities. The
		Sandbanks which are slightly covered by sea water all the time [1110]	Ν	Solent Maritime SAC, covering approximately 163.4 m <sup>2</sup> ne KP0.76.
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	However, the project design only proposes the use of HD exit/entry point located between KP1.0 and KP1.6 (approx SAC). Therefore, there is no pathway for the Proposed D
		Spartina swards [1320]	Ν	disturbance to the SAC.
		Atlantic salt meadows [1330]	Ν	Therefore, there is no potential for habitat disturbance to LSE.
		Salicornia and other annuals colonising mud and sand [1310]	Ν	
	Increased SSC	Estuaries [1130]	Y	During dredge disposal, peak SSC of 1000 mgl <sup>-1</sup> could ar
		Sandbanks which are slightly covered by sea water all the time [1110]	Y	but coarser sediment expected to fall out of suspension q significant reductions of SSC within hours of disposal at e release, the passive plume which is transported beyond the
		Mudflats and sandflats not covered by seawater at low tide [1140]	Y	region of approximately 20 mgl <sup>-1</sup> , transported in the direct distance of <i>c</i> . 25km. SSC is predicted to reduce to $<1 - 6$ days following completion of disposal activities.
		Spartina swards [1320]	Y	Other cable installation activities (including for repair and to raise SSC in the vicinity of the work. It is predicted that
		Atlantic salt meadows [1330]	Y	observed locally (i.e. within 2 km of the cable trench or HI potentially persist for several hours following completion of
		Salicornia and other annuals colonising mud and sand [1310]	Υ	plumes are also likely to be transported up to 5 km away is concentrations of 5 to 10 mgl <sup>-1</sup> are predicted. SSC is expe- within a few days following completion of these activities. be transported up to 6-10 km in the nearshore area, howe these distances will be low (< 5 mgl <sup>-1</sup> ) and therefore not d
				Due to the close proximity of the Solent Maritime SAC (ind of which is located less than 1 km from the Marine Cable for increased levels of SSC to be present within the SAC, ruled out for any feature (at any project phase) which has
	Deposition of	Estuaries [1130]	Y	Sediment deposition from disposal activities will be local t
	sediment (smothering)	Sandbanks which are slightly covered by sea water all the time [1110]	Y	<ul> <li>m), with deposits of coarser sediments potentially observed</li> <li>1.5 m, with greatest deposition observed across an area of the direction of the prevailing flow at the time of release, r</li> </ul>
		Mudflats and sandflats not covered by seawater at low tide [1140]	Y	sediments will be redistributed and any deposition outside

### Table 7.1 - Assessment of LSE on designated Annex I features as a result of the Proposed Development across all phases of development



vill be affected by habitat disturbance as e Marine Cable Corridor overlaps the near the Landfall between KP0 and

DD Landfall methodology, with the HDD ox. 0.24 km from the boundary of the Development to result in habitat

Annex I habitats, and no potential for

arise within 1 km from the release point quickly (almost immediately) with each location. Beyond 1 km from this is likely to generate SSC in the oction of the prevailing flow out to a 6 mgl<sup>-1</sup> within the timeframe of a few

at peak SSCs of up to 200 mgl<sup>-1</sup> may be HDD pit) and these concentrations could n of construction activities. Sediment y from the trench or pit at which point pected to return to background levels s. The finest sediments will potentially wever it is highly likely that SSCs at discernible above natural variation.

including Langstone harbour, the mouth le Corridor), and the resulting potential C, it is considered that LSE cannot be as connectivity to the work.

I to the point of release (i.e. within 1000 ved to depths of between 10 mm and a of a few hundred metres, elongated in relative to the release site. Finer de the Marine Cable Corridor will be

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SAC	Effect	Feature	LSE?	Justification
		Spartina swards [1320]	Y	transient and negligible, with any settled material being qui tidal flows.
		Atlantic salt meadows [1330]	Y	Other cable installation activities (including for repair and n
		Salicornia and other annuals colonising mud and sand [1310]	Y	to result in sediment depositon. Due to the close proximity of the Solent Maritime SAC (inc of which is located less than a kilometre from the Marine C potential for deposition within the SAC, it is considered that be ruled out.
	Habitat loss	Estuaries [1130]	N	Due to the use of HDD at cable Landfall, marine activities
		Sandbanks which are slightly covered by sea water all the time [1110]	N	be undertaken only in the Marine Cable Corridor beyond the located between KP1.0 to KP1.6, outside the overlap area (boundary of SAC at approx. KP0.76). This includes excav
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	HDD exit/entry point. Habitat loss as a result of sediment deposition has been condeposition will not result in potential for habitat loss via characteristics.
		Spartina swards [1320]	N	seabed type as any deposition that does occur will be of si be of a level to cause a change in seabed type or profile (s
		Atlantic salt meadows [1330]	N	deposition for details of predicted levels).
		Salicornia and other annuals colonising mud and sand [1310]	N	Therefore, there is no potential for Annex I habitat loss with potential for LSE.
	Pollution	Estuaries [1130]	Y	Marine litter is any manufactured or processed solid mater discarded, disposed or abandoned (excluding legitimate di
		Sandbanks which are slightly covered by sea water all the time [1110]	Y	coastal environment including: plastics, metals, timber, rop degraded components, e.g. microplastic particles (Natural can be physical (smothering), biological (ingestion, includir
		Mudflats and sandflats not covered by seawater at low tide [1140]	Y	entangling; physical damage; accumulation of chemicals) a contamination).
		Spartina swards [1320]	Y	Marine litter can be released into the marine environment la accidentally (inappropriate storage) or deliberately (Potts a
		Atlantic salt meadows [1330]	Y Mouat, 2009). Shi	Mouat, 2009). Shipping related litter contributes approximate beaches.
		Salicornia and other annuals colonising mud and sand [1310]	Y	<ul> <li>Deliberate discharges of oil or oil/water mixtures and synth prohibited in all waters around the UK and its approaches. occur.</li> <li>Drilling fluid, usually consisting of water and clay material (Whilst methods can be employed to minimise the risk, leak into the environment can occur.</li> </ul>



quickly redistributed under the forcing of

d maintenance) also have the potential

ncluding Langstone harbour, the mouth Cable Corridor), and the resulting hat LSE (at any project phase) cannot

es that can result in a loss of habitat will the HDD entry/exit point which will be ea with the Solent Maritime SAC eavation of seabed sediments at the

considered. It is determined that any change to another sediment type or similar sediment types and would not (see assessment of LSE for sediment

vithin the Solent Maritime SAC, and no

erial from anthropogenic activities disposal) once it enters the marine and ope, fishing gear etc. and their al England, 2019). Ecological effects ding uptake of microplastics; and/or chemical (leaching,

t by shipping vessels either s and Hasting, 2011; Lozano and mately 2% of the litter found on UK

nthetic compounds from ships are es. However, accidental discharges still

al (bentonite) will be used as a lubricant. akage or outbreaks of these materials

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SAC	Effect	Feature	LSE?	Justification
				It is therefore considered that the potential for LSE as a re cannot be ruled out.
	Resuspension of	Estuaries [1130]	N	Results from the subtidal contaminated sediment survey (
	contaminated sediments	Sandbanks which are slightly covered by sea water all the time [1110]	Ν	Sediment Quality), indicate that the sediments within the M significantly elevated levels of contaminants with no record Cefas Action Level 2. In addition, for all contaminants other Action Level 1 was reserved.
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	Action Level 1 was recorded. Arsenic did exceed Action L at one of these was it above the Oslo and Paris Conventio Assessment Concentration) however these appear isolate
		Spartina swards [1320]	N	pattern or common source. Evidence from the nearby IFA2 interconnector and Rampi
		Atlantic salt meadows [1330]	N	the wider area is not heavily contaminated.
	Salicornia and other annuals colonising N indicates that the	<ul> <li>The lack of contamination in the nearshore sediments with indicates that there is a very low risk of sediment borne co water column. As such, it is therefore considered that ther this effect.</li> </ul>		
	Invasive species	Estuaries [1130]	Y	The introduction and INIS can occur directly through the reinto the environment via activities, e.g. through release of
		Sandbanks which are slightly covered by sea water all the time [1110]	Y	hull of ships even if recently cleaned or anti-fouled (Interna 2012; Davidson <i>et al.</i> , 2010), or indirectly by creating oppospread (e.g. habitat creation or disturbance), thereby allow
		Mudflats and sandflats not covered by seawater at low tide [1140]	Y	species. The Proposed Development will increase local traffic, dist
		Spartina swards [1320]	Y	hard substrate (in the form of cable protection), which has introduction and spread of INIS. However, this area is a b
		Atlantic salt meadows [1330]	Y	possesses significant hard substrate modifications for navi measures.
		Salicornia and other annuals colonising mud and sand [1310]	Y	There are several INIS species known to be present in the slipper limpet ( <i>Crepidula fornicate</i> ), Pacific oyster ( <i>Crasso</i> mitten crabs ( <i>Eriocheir sinensis</i> ), wire weed ( <i>Sargassum r</i> ( <i>styela clava</i> ) (Eno <i>et al.</i> , 1997; GB Non-Native Species S
				It is therefore considered that the potential for LSE as a re
	EMF	Estuaries [1130]	N	EMF effects will not extend outwith the Marine Cable Corr feature are likely. Therefore, there is no potential for LSE
		Sandbanks which are slightly covered by sea water all the time [1110]	Ν	This feature may be present directly over the operating ca burial depth under the SAC is 5 m. At this depth, the predi including Geostatic field) (Chapter 3 Description of the Pro- reference 6.1.3). This is broadly equivalent to the backgrou



result of pollution (including litter)

r (Chapter 7 Marine Water and Marine Cable Corridor do not contain ords of any contaminant exceeding her than Arsenic, no exceedance of Level 1 at two locations (although only tions ('OSPAR') Background ted areas and with no indication of a

pion OWF projects also suggests that

ithin the Marine Cable Corridor contaminants being re-released into the ere is no potential for LSE to arise from

release of individuals of INIS species of ballast water (Ware, 2009), on the national Maritime Organisation (IMO), portunities for organisms to settle or owing for them to out-compete native

sturb the seabed and introduce new as the potential to influence the a busy shipping channel and already avigation, ports and flood protection

he Marine Cable Corridor, such as the sostrea (Magallana) gigas), Chinese n muticum), and the leathery sea squirt Secretariat, 2019).

result of INIS cannot be ruled out.

prridor and as such no effects on this E.

cable. Due to the use of HDD, the target edicted EMF will be 2  $\mu$ T (50  $\mu$ T Proposed Development, document bund geostatic field.

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SAC	Effect	Feature	LSE?	Justification
				The majority of the research relating to the environmental in birds and fish, also electro-sensitive marine species su 2010). Although some invertebrate species are thought to there is no evidence to indicate that EMF has any detrime Therefore, due to the negligible change in EMF compared there is no potential for LSE.
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	This feature may be present directly over the operating ca burial depth under the SAC is 5 m. At this depth, the preci including Geostatic field) (Chapter 3 (Description of the P Environment Statement). This is broadly equivalent to the
				The majority of the research relating to the environmental in birds and fish, also electro-sensitive marine species su 2010). Although some invertebrate species are thought to there is no evidence to indicate that EMF has any detrime Therefore, due to the negligible change in EMF compared there is no potential for LSE.
		Spartina swards [1320]	N	EMF effects will not extend outwith the Marine Cable Cor feature are likely. Therefore, there is no potential for LSE
		Atlantic salt meadows [1330]	N	EMF effects will not extend outwith the Marine Cable Cor feature are likely. Therefore, there is no potential for LSE
		Salicornia and other annuals colonising mud and sand [1310]	N	EMF effects will not extend outwith the Marine Cable Cor feature are likely. Therefore, there is no potential for LSE
	Increased light	Estuaries [1130]	N	Increased pressure may potentially result from navigation during construction repair and maintenance activities. Lic
	Pollution	Sandbanks which are slightly covered by sea water all the time [1110]	N	working conditions on site, therefore only habitats within, metres) to the Marine Cable Corridor are considered to h construction activities.
		Mudflats and sandflats not covered by seawater at low tide [1140]	Ν	Lighting can cause disorientation or displace sensitive sp organisms have some sensitivity to light (Tillin, 2016a; Til effects relating to this potential impact are only relevant to planned in SPAs which have sensitive species that could the year (OSPAR, 2008; Shell Offshore Inc., 2011; Hill, 1 Commission, 2009; Royal Haskoning, 2011; Montevecchi Due to the use of HDD below the intertidal area, marine a undertaken only in the Marine Cable Corridor at or beyon be located between KP1.0 to KP1.6. This is outside the of SAC (boundary of which lies at approx. KP0.76). Therefore



al effects of EMF is migratory behaviour such as elasmobranchs (Gill and Bartlett, to be electro or magneto-sensitive, nental effects on benthic organisms. ed to background levels it is considered

cable. Due to the use of HDD, the target edicted EMF will be 2  $\mu$ T (50  $\mu$ T Proposed Development) of the background geostatic field.

al effects of EMF is migratory behaviour such as elasmobranchs (Gill and Bartlett, to be electro or magneto-sensitive, nental effects on benthic organisms. ed to background levels, it is considered

orridor and as such no effects on this SE.

prridor and as such no effects on this E.

orridor and as such no effects on this SE.

on and operational lighting on vessels ighting is required to enable safe , or in very close proximity (tens of have the potential to be affected during

species (Natural England, 2019). Benthic Fillin, 2016d), however the majority of to birds, where night operations are ld be present and at sensitive times of 1992; Dwyer *et al.*, 2013; European hi, 2006).

activities which require lighting will be nd the HDD entry/exit point, which will overlap area with the Solent Maritime ore, there is no potential for LSE.

WSP/Natural Power

SAC	Effect	Feature	LSE?	Justification
	Temperature changes	Estuaries [1130]	N	Temperature effects will not extend outwith the Marine Ca on this feature are likely. Therefore, there is no potential
		Sandbanks which are slightly covered by sea water all the time [1110]	N	Operation of the cables will result in heat being emitted from of the surrounding environment. Heat losses reduce the en- the cables have been designed to minimise thermal loss. proximity of the cable and quickly dissipate (Aecom Interter emission and its effects will depend on the type of cables environment (OSPAR Commission, 2012).
				Thermal resistance for the soil surrounding a buried cable burial depth. A study undertaken to inform the Nemo Link 2013) calculated that localised temperature increases in t buried to a depth of 2.5 m would be 1.2°C at 30 cm depth 2.2 m directly above the cable, 30 cm below the seabed s conservative calculation of temperature increases for bun Interconnector project (Brakelmann and Stammen, 2016; cable installation in German waters showed the potential depth of 0.2 m above an operating cable as a worst-case undertaken for NorthConnect project (2018) predicted tha 0.5 m would result in a temperature rise of 1°C above bac directly above the cable, decreasing with distance.
				These results are not directly comparable due to difference background temperature, however they demonstrate an a heat, and the dissipation effect of distance from the cable
				While no modelling is available for Proposed Development depth beneath the SAC (and this feature) is 5 m. HDD me are likely to maintain a higher temperature locally, however duct and when considering the distance to the surface set temperature increases are unlikely to be detectable at the potential for LSE.
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	As explained above when considering the possible effects slightly covered by sea water all the time, it is considered unlikely to be detectable at the surface (due to HDD meth qualifying feature of 5 m). Therefore, there is no potential
		Spartina swards [1320]	Ν	Temperature effects will not extend outwith the Marine Ca on this feature are likely. Therefore, there is no potential
		Atlantic salt meadows [1330]	Ν	Temperature effects will not extend outwith the Marine Ca on this feature are likely. Therefore, there is no potential



Cable Corridor and as such no effects al for LSE.

from the cable and subsequent warming e efficiency of the cable and as a result, s. Heating effects will be localised to the rtek, 2011; Nemo Link, 2013). Thermal es, transmission rate and the receiving

ble usually increases with increasing the nk Interconnector project (Nemo Link, n the seabed above the bundled cables oth above the cable (i.e. at a distance of d surface) and 0.7°C at 10 cm. A undled cables conducted for Viking Link 6; Viking Link, 2017) for the purpose of al for an increase of 2°C at a sediment se scenario. In contrast, a study hat bundled cables buried at a depth of background levels at the seabed level

nces in baseline scenarios, particularly association between burial depth and le.

ent, due to the use of HDD, target burial methods resulting in cable burial to 5 m ever the cable will be contained within a sediments, it is considered that he surface. Therefore, there is no

cts of EMF on Sandbanks which are that temperature increases are thods resulting in burial under the al for LSE.

Cable Corridor and as such no effects al for LSE.

Cable Corridor and as such no effects al for LSE.

WSP/Natural Power

SAC	Effect	Feature	LSE?	Justification
		Salicornia and other annuals colonising mud and sand [1310]	N	Temperature effects will not extend outwith the Marine Ca on this feature are likely. Therefore, there is no potential f
	Hydrodynamic changes	Estuaries [1130]	N	A number of activities can affect hydrodynamic processes protection, removal of bedforms or the creation of depress
		Sandbanks which are slightly covered by sea water all the time [1110]	N	operations. More detail on the predicted hydrodynamic ch Development can be found in Chapter 6 (Physical Proces reference 6.1.6).
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	The Physical Processes assessment concluded that any h small, highly localised and temporary resulting from near h elevated turbulence intensities as a result of the work.
		Spartina swards [1320]	N	All work will be undertaken at and beyond the HDD entry/e
		Atlantic salt meadows [1330]	N	outside of the overlap area with the Solent Maritime SAC and there is adequate distance between the HDD and SA
		Salicornia and other annuals colonising mud and sand [1310]	N	effects of any hydrodynamic changes within, effecting the negligible. Therefore, there is no potential for LSE.
South Wight Maritime	Habitat disturbance	Submerged or partially submerged sea caves [8330]	N	No work associated with the Proposed Development will ta Maritime SAC. Therefore, there is no potential for habitat
		Reefs [1170]	N	
	Increased SSC	Submerged or partially submerged sea caves [8330]	Y	During dredge disposal, peak SSC of 1000 mgl <sup>-1</sup> could ari but coarser sediment expected to fall out of suspension qu significant reductions of SSC within hours of disposal at ea release, the passive plume which is transported beyond th region of approximately 20 mgl <sup>-1</sup> , transported in the directi distance of c. 25km. SSC is predicted to reduce to <1 – 6 completion of disposal activities.Background SSC coastal Physical Processes).
				Other cable installation activities (including for repair and it to raise SSC in the vicinity of the work. It is predicted that observed locally (i.e. within 2 km of the cable trench or HE potentially persist for several hours following completion of plumes are also likely to be transported up to 5 km away from concentrations of 5 to 10 mgl <sup>-1</sup> are predicted. SSC is experimitely and the transported up to 6-10 km in the nearshore area, howe these distances will be low (< 5 mgl <sup>-1</sup> ) and therefore not distances.
				The closest example of this feature is 10 km from the Mar considered that the potential for LSE (at any stage) on this



Cable Corridor and as such no effects I for LSE.

es including installation of cable ssions created through installation changes resulting from the Proposed esses) of the ES Volume 1 (document

hydrodynamic changes will be veryr bed flow velocities and slightly

//exit point KP1.0-KP1.6, and therefore C (which is located at approx. KP 0.76), AC (0.24 km) that it is predicted that the le qualifying features of the SAC are

I take place within the South Wight at disturbance, and no potential for LSE.

arise within 1 km from the release point quickly (almost immediately) with each location. Beyond 1 km from this is likely to generate SSC in the ction of the prevailing flow out to a 6 mgl<sup>-1</sup> within a few days following al areas is 5 to 75 mgl<sup>-1</sup> (Chapter 6

d maintenance) also have the potential at peak SSCs of up to 200 mgl<sup>-1</sup> may be HDD pit) and these concentrations could of construction activities. Sediment y from the trench or pit at which point bected to return to background levels a. The finest sediments will potentially vever it is highly likely that SSCs at discernible above natural variation.

arine Cable Corridor and it is his feature cannot be ruled out.

WSP/Natural Power

SAC	Effect	Feature	LSE?	Justification
		Reefs [1170]	Y	During dredge disposal, peak SSC of 1000 mgl <sup>-1</sup> could an but coarser sediment expected to fall out of suspension q significant reductions of SSC within hours of disposal at e release, the passive plume which is transported beyond th region of approximately 20 mgl <sup>-1</sup> , transported in the direct distance of c. 25km. SSC is predicted to reduce to backgr timeframe of a few days following completion of disposal a Other cable installation activities (including for repair and
				to raise SSC in the vicinity of the work. It is predicted that observed locally (i.e. within 2 km of the cable trench or HI potentially persist for several hours following completion of plumes are also likely to be transported up to 5 km away concentrations of 5 to 10 mgl <sup>-1</sup> are predicted. SSC is expe- within a few days following completion of these activities. be transported up to 6-10 km in the nearshore area, howe these distances will be low (< 5 mgl <sup>-1</sup> ) and therefore not d
				The closest example of this feature is 3.3 km from the Ma considered that the potential for LSE (at any stage) on this
	Deposition of sediment (smothering)	Submerged or partially submerged sea caves [8330]	Y	Sediment deposition from disposal activities will be local to m), with deposits of coarser sediments potentially observed 1.5 m, with greatest deposition observed across an area of the direction of the prevailing flow at the time of release, r
				Other cable installation activities (including for repair and to result in sediment depostion.
				Finer sediments will be redistributed and any deposition of predicted to be transient and negligible, with any settled nunder the forcing of tidal flows.
				Due to the distance from the proposed activities (10 km), stage) on this feature cannot be ruled out.
		Reefs [1170]	Y	Sediment deposition from disposal activities will be local to m), with deposits of coarser sediments potentially observe 1.5 m, with greatest deposition observed across an area of the direction of the prevailing flow at the time of release, re
				Finer sediments will be redistributed and any deposition of predicted to be transient and negligible, with any settled nunder the forcing of tidal flows.
				Other cable installation activities (including for repair and to result in sediment depostion.



arise within 1 km from the release point quickly (almost immediately) with each location. Beyond 1 km from this is likely to generate SSC in the ction of the prevailing flow out to a ground levels (<1 – 6 mg/l) within the I activities.

d maintenance) also have the potential at peak SSCs of up to 200 mgl<sup>-1</sup> may be HDD pit) and these concentrations could of construction activities. Sediment y from the trench or pit at which point bected to return to background levels a. The finest sediments will potentially vever it is highly likely that SSCs at discernible above natural variation.

larine Cable Corridor and it is his feature cannot be ruled out.

to the point of release (i.e. within 1000 ved to depths of between 10 mm and a of a few hundred metres, elongated in relative to the release site.

d maintenance) also have the potential

outside the Marine Cable Corridor are material being quickly redistributed

, it is considered that LSE (at any

to the point of release (i.e. within 1000 ved to depths of between 10 mm and a of a few hundred metres, elongated in relative to the release site.

outside the Marine Cable Corridor are material being quickly redistributed

d maintenance) also have the potential

WSP/Natural Power

SAC	Effect	Feature	LSE?	Justification	
				Due to the distance from the proposed activities (3.3 km), stage) on this feature cannot be ruled out.	
	Habitat loss	Submerged or partially submerged sea caves [8330]	Ν	No work will be undertaken within the South Wight Maritin potential for habitat loss, and no potential for LSE.	
		Reefs [1170]	Ν	Habitat loss as a result of sediment deposition has been of any deposition will not result in potential for habitat loss vi seabed type as any deposition that does occur will be of s be of a level to cause a change in seabed type or profile ( deposition for details of predicted levels).	
	Pollution	Submerged or partially submerged sea caves [8330]	Υ	Marine litter is any manufactured or processed solid mate discarded, disposed or abandoned (excluding legitimate coastal environment including: plastics, metals, timber, ro	
		Reefs [1170]	Y	degraded components, e.g. microplastic particles (Natural can be physical (smothering), biological (ingestion, includi entangling; physical damage; accumulation of chemicals) contamination).	
				Marine litter can be released into the marine environment accidentally (inappropriate storage) or deliberately (Potts Mouat, 2009). Shipping related litter contributes approxim beaches.	
				Deliberate discharges of oil or oil/water mixtures and synth prohibited in all waters around the UK and its approaches occur.	
				Drilling fluid, usually consisting of water and clay material Whilst methods can be employed to minimise the risk, lea into the environment can occur.	
				It is therefore considered that the potential for LSE as a recannot be ruled out.	
	Invasive species	Submerged or partially submerged sea caves [8330]	Y	The introduction and spread of INIS can occur directly throus species into the environment via activities, e.g. through re on the hull of ships even if recently cleaned or anti-fouled	
		Reefs [1170]	Υ	indirectly by creating opportunities for organisms to sett disturbance), thereby allowing for them to out-compete	
				The Proposed Development will increase local traffic, dist hard substrate (in the form of cable protection), which has introduction and spread of INIS. However, this area is a base of the second structure of the second str	



n), it is considered that LSE (at any

ime SAC and therefore there is no

considered but it is determined that via change to another sediment type or f similar sediment types, and would not (see assessment of LSE for sediment

terial from anthropogenic activities disposal) once it enters the marine and rope, fishing gear etc. and their al England, 2019). Ecological effects ding uptake of microplastics; s) and/or chemical (leaching,

nt by shipping vessels either s and Hasting, 2011; Lozano and mately 2% of the litter found on UK

nthetic compounds from ships are es. However, accidental discharges still

al (bentonite) will be used as a lubricant. eakage or outbreaks of these materials

result of pollution (including litter)

nrough the release of individuals of INIS release of ballast water (Ware, 2009), d (IMO, 2012; Davidson *et al.*, 2010), or e or spread (e.g. habitat creation or native species.

sturb the seabed and introduce new as the potential to influence the a busy shipping channel and already

WSP/Natural Power

SAC	Effect	Feature	LSE?	Justification
				possesses significant hard substrate modifications for nav measures. There are several INIS species known to be present in the slipper limpet, <i>Crepidula fornicata</i> , Pacific oyster ( <i>Crassos</i> mitten crabs ( <i>Eriocheir sinensis</i> ), wire weed ( <i>Sargassum i</i> ( <i>styela clava</i> ) (Eno <i>et al.</i> , 1997; GB Non-Native Species S It is therefore considered that the potential for LSE as a re-
	EMF	Submerged or partially submerged sea caves [8330]	Ν	EMF effects will not extend outwith the Marine Cable Corr feature are likely. Therefore, there is no potential for LSE
		Reefs [1170]	Ν	EMF effects will not extend outwith the Marine Cable Corr feature are likely. Therefore, there is no potential for LSE
	Increased light Pollution	Submerged or partially submerged sea caves [8330]	Ν	The South Wight Maritime SAC lies over 3 km from the Pr potential for increased light to be present at a level that ma Therefore, it is considered that there is no potential for LS
		Reefs [1170]	Ν	
	Resuspension of contaminated	Submerged or partially submerged sea caves [8330]	Ν	Results from the subtidal contaminated sediment survey ( Sediment Quality), indicate that the sediments within the significantly elevated levels of contaminants with no record
	sediments	Reefs [1170]	Ν	<ul> <li>Significantly elevated levels of contaminants with no fector.</li> <li>Cefas Action Level 2. In addition, for all contaminants other Action Level 1 was recorded. Arsenic did exceed Action L at one of these was it above the OSPAR Background Ass these appear isolated areas and with no indication of a particle area is not heavily contaminated despite the lon military activity in the area.</li> <li>The lack of contamination in the nearshore sediments with indicates that there is a very low risk of sediment borne convator water column. As such, it is therefore considered that there effects to arise from this impact. It is therefore considered</li> </ul>
	Temperature changes	Submerged or partially submerged sea caves [8330]	Ν	Temperature effects will not extend outwith the Marine Ca on this feature are likely. Therefore, there is no potential
		Reefs [1170]	Ν	



avigation, ports and flood protection

he Marine Cable Corridor, such as the ostrea (Magallana) gigas), Chinese n muticum), and the leathery sea squirt Secretariat, 2019).

result of INIS cannot be ruled out.

prridor and as such no effects on this E.

prridor and as such no effects on this E.

Proposed Development, and there is no may affect Annex I habitat features. SE.

Chapter 7 Marine Water and
 Marine Cable Corridor do not contain
 ords of any contaminant exceeding
 ther than Arsenic, no exceedance of
 Level 1 at two locations (although only
 ssessment Concentration) however
 pattern or common source.

pion OWF projects also suggests that ong history of port, heavy shipping, and

ithin the Marine Cable Corridor contaminants being re-released into the ere is negligible potential for significant ed that there is no potential for LSE.

Cable Corridor and as such no effects I for LSE.

WSP/Natural Power

SAC	Effect	Feature	LSE?	Justification
	Hydrodynamic changes	Submerged or partially submerged sea caves [8330]	Ν	A number of activities can affect hydrodynamic processes the removal of bedforms, and from depressions created the detail on the predicted hydrodynamic changes resulting from
		Reefs [1170]	Ν	found in Chapter 6 Physical Processes. The Physical Processes assessment concluded that any h small, highly localised and temporary resulting from near h elevated turbulence intensities as a result of the work. The Proposed Development is over 3km from the boundar predicted that that any effects due to any hydrodynamic cl is considered that there is no potential for LSE.
	Noise and Vibration	Reefs [1170]	Ν	Vessel movement is an important source of underwater not Activities resulting in vibration include trenching for cable Enterprise and Regulatory Reform (BERR), 2008; Robinso (Robinson <i>et al.</i> , 2011). This pressure is only relevant to be time on land for breeding purposes (haul-outs), and is not however for intertidal rock habitats, some benthic species crabs). Any noise and vibration from cable installation will and elevations above background are unlikely to extend be (Nedwell <i>et al.</i> , 2003). Therefore, it is considered that the



es, from installation of rock protection, through installation operations. More from the Proposed Development can be

hydrodynamic changes will be very
 r bed flow velocities and slightly

lary of the SAC, and it is therefore changes are negligible, and therefore it

noise (OSPAR Commission, 2009). e laying (Department for Business nson *et al.*, 2011), and dredging b birds and sea mammals that spend ot relevant to most benthic habitats, es can perceive noise and vibration (e.g. vill be of low magnitude (OSPAR, 2009) beyond the Marine Cable Corridor here is no potential for LSE.

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### 7.2.2. ANNEX II DIADRAMOUS MIGRATORY FISH

### <u>Salmon</u>

- 7.2.2.1. Salmon are an interest feature of a number of SACs where connectivity may exist with the potential effects identified for the Proposed Development. All SACs within the study area which list salmon as qualifying features are listed below:
  - River Itchen;
  - River Avon;
  - Baie de Canche et Couloir des trois Estuaires; and
  - Baie de Seine Orientale.
- 7.2.2.2. Salmon have a high degree of site fidelity and will return as adults to spawn in the same river where they were born. It is considered that although salmon are destined for specific rivers in the UK (or France) they are the same species and therefore sensitive to the same effects.
- 7.2.2.3. Effects for which salmon have been identified as potentially sensitive (Table 7-2) for both the construction (and decommissioning) and also operational (maintenance and repair) phases of the Proposed Development (Table 7-3) are as follows:
- 7.2.2.4. Construction (and decommissioning)
  - Increased SSC;
  - Physical injury;
  - Invasive species;
  - Pollution events;
  - Noise and vibration; and
  - Visual disturbance.
- 7.2.2.5. Operation (repair and maintenance)
  - Increased Suspended Sediment Concentrations (SSC);
  - Physical injury;
  - Invasive species;
  - Pollution events;
  - Noise and vibration;
  - Visual disturbance;
  - EMF; and
  - Temperature changes.



- 7.2.2.6. Once installation is complete the buried (or protected) cables will have a life expectancy of at least 40 years. The Proposed Development has been designed so that routine maintenance to the Marine Cables is not required during their operational lifetime. However, there may be the requirement to undertake unplanned repair works. Therefore, during the operation phase of the Proposed Development, the effects are expected to be no greater than that of the construction phase.
- 7.2.2.7. Where those effects assessed for construction are not considered to lead to LSE on the features of this site during construction (or decomisioning), they will not be assessed again for operation. Two additional effects relevant to salmon and specific to the operational phase of a power cable are EMFs and temperature changes, and these effects will be assessed accordingly.

SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
River Itchen	Increased SSC	The potential impact of increased SSC relates to the sediment released as a result of the cable installation and associated works such as dredge and disposal activities, route clearance and rock placement for both the Marine Cable Corridor and Landfall.	Y (UK sites only)
River Avon Baie de Canche et Couloir des trois Baie de Seine Orientale		Salmon are known to use the coast for migration and there is the possibility that an increase in SSC could pose a barrier to their migration or cause respiratory effects from depleted oxygen. As LSE cannot be fully ruled out for this impact it will be progressed to AA stage for the River Ithcen and River Avon only.	
		Interest features from French sites are not considered to be affected as SSC increases are not predicted to result in a barrier effect to salmon migration. Therefore, no LSE is determined for Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale ZSCs.	
	Physical injury	The construction (and decommissioning) phase of the Proposed Development will require the use of construction vessels which may pose a collision risk to salmon. It is considered however that as this species (both adult and smolts) is highly mobile and has the innate ability to avoid areas of increased vessel traffic the possibility of this impact is occurring is extremely low. In addition, there is a lack of publicly available literature on this subject which indicating it is not an area of interest or concern.	Ν
		Although a potential route to impact exists, the likelihood of the impact occurring is considered to be extremely low and the effects are predicted to be negligible. It is therefore considered that the impact will not lead to LSE on the River Itchen, River Avon, Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale.	
	Invasive species	The introduction of invasive species can be harmful to indigenous populations in locations where they do not naturally occur. As a number of vessels will be required for the construction (and operation and decommissioning) of the cables and associated equipment, there is the possibility that invasive species may be introduced via biofouling or ballast water which are harmful to salmon.	Ν
		The introduction of non-native migratory fish species has the potential to increase competition for spawning grounds with domestic salmon stocks and potentially reduce recruitment. In addition, the introduction of non-native parasites could also have negative effects on salmon stocks. An example of this is the capture of non-native pink salmon ( <i>Oncorhynchus gorbuscha</i> ) in Scottish and Northumberland rivers (Tweed and Tyne) although this cannot be attributed to ship ballast water but rather an adult migration across the North Sea from North Norway. There is a lack publicly available literature on the introduction on non-native parasites which are harmful to salmon.	
		It is considered unlikely that non-native species will be introduced as a result of construction vessels operating in the near and offshore sections of the Proposed Development, and it is highly unlikely that any of these will be harmful to salmon.	
		It is considered therefore that the potential introduction of non-native species as a result of the Proposed Development alone, will not lead to an LSE on the River Itchen SAC, River Avon SAC, Baie de Canche et Couloir des trois Estuaires SAC and Baie de Seine Orientale SAC.	
	Pollution Events	Pollution as a result of installation (operational and decommissioning) activities such as litter and contamination (hydrocarbons, PAH, pesticides, anti-foulants, pharmaceuticals) from installation vessels and release of liquids (bentonite) from HDD operations may have effects on salmon (and smolts) whilst they are migrating to or from their natal rivers. As LSE cannot be fully ruled out this effect will be progressed to AA stage.	Y
		Historic pollution in the form of contaminated sediments (i.e. transition elements and organo-metals) is not considered to have the potential to lead to LSE as the area of work is not highly contaminated.	

### Table 7.2 - LSE Assessment for Salmon during Construction and Decommissioning from the Proposed Development



WSP/Natural Power

SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
	Noise and vibration	The impact of noise and vibration may occur as a result of cable installation (and decommissioning) activities (cable laying and cable protection) and Landfall activities (HDD, vibro-hammering of four 36" steel casings and support lattices).	Ν
		Salmon are classed as hearing generalists with the swim bladder playing no part in hearing. Hawkins <i>et al.</i> (1978) showed that salmon have a relatively low sensitivity to noise with a narrow frequency span and limited ability to discriminate between sounds. In addition, Harding <i>et al.</i> (2016) found an absence of stress response in captive fish exposed to piling playback in tank-based experiments.	
		Generally, the maximum sound pressure levels (SPLs) relating to installation of a marine cable are moderate to low (OSPAR, 2009). Nedwell et al. (2003) found that the noise emitted from cable trenching at North Hoyle OWF was 123 dB re 1 µPa (at a range of 160 m).	
		Both HDD and vibro hammering/pile driving (used for steel casings and supporting trestles at the Landfall) are considered to produce substantially less underwater noise than impact piling. Nedwell <i>et al.</i> (2012) found that underwater noise monitoring of HDD operating 39 m below a river resulted in levels of 129.5 dB re 1 µPa on the river bed. It was noted however that due to the shallow water conditions the sound attenuated rapidly, in addition there was no shipping noise present. It is likely that HDD operations for the Proposed Development will be result in similar noise levels. Nedwell <i>et al.</i> (2003) found no discernible increase in underwater noise from an active vibropiling rig at a distance of 417.4m against the background noise of Town Quay, Southampton with caged brown trout ( <i>Salmo trutta</i> ) showing no reaction to active vibro piling even at close range (<50m).	
		Popper <i>et al.</i> (2014) recommended guidelines for assessing shipping and other continuous noises, with cable laying, vibro piling and HDD considered to fall within this category. Fish with swim bladders not involved in hearing, such as salmon, were assigned a low risk to mortality, potential mortal injury and recoverable injury near to the source from continuous sound sources.	
		It is also considered that given salmons low sensitivity to underwater noise and vibration, construction (operation and decommissioning) are note predicted to result in any significant barrier effects.	
		Given that salmon have a low sensitivity to noise / vibration and are at low risk from mortality and injury as a result of trenching operations, HDD and vibro piling it is considered that this impact as a result of the Proposed Development alone, will not lead to LSE on the River Itchen, River Avon, Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale.	
	Visual Disturbance	The impact of visual disturbance during installation (and decommissioning) to salmon could potentially occur due to the increase in vessels including jack up vessels as part of HDD works, installation equipment on the seabed (grapnels, displacement ploughs, trenching tools including MFE) and attachment lines / anchors.	Ν
		Salmon, like most fish, are highly adapted to detect changes in the visual environment with visual stimuli such as vessels potentially evoking a disturbance response which may incur unnecessary stress and use of energy. The common reaction to a potentially harmful situation is to escape and gain distance from the source; with fish this is often presented by fleeing to deeper water (Ali, 1961). Flight behaviours are characterised by fast-start swimming which is a high energy burst and rapid acceleration in swimming speed usually away from the disturbance (Domenici and Blake, 1997). The duration of response and therefore stress, is a reflection of the potential risk versus the cost of avoidance with stress levels increasing dependent on the time the fish is exposed to the stimuli (Endler, 1991).	
		Bui <i>et al.</i> (2013) found that surface disturbance in a cage of farmed salmon elicited avoidance of the surface by individuals but, it did not produce flight responses and elevated swimming speeds seen in other stimuli such as the introduction of light. With this in mind it is likely that salmon in the Solent are accustomed to vessel traffic (due to the area being subject to high shipping / vessel movements) and the presence of vessels towing equipment (e.g. commercial fishing vessels) and will simply navigate round or under any installation vessels with minimal stress.	



SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
		In light of the above it is considered that salmon will be largely unaffected by this impact as a result of the Proposed Development alone, and this impact as predicted not to result in a LSE on the River Itchen SAC, River Avon SAC, Baie de Canche et Couloir des trois Estuaires SAC and Baie de Seine Orientale SAC.	



SAC	Effect	Assessment
River Itchen	EMF	The potential impact of EMF could occur as a result of the operation of the HVDC interconnector cables. The prestrength for EMF around the cables is 42 $\mu$ T at 1 m depth, with the proposed minimum burial depth for the cable
River Avon Baie de Canche et		Adult salmon although generally surface dwelling is known to pass through a range of water depths whilst at set 2014); this is also true for smolts which swim close to the surface although they have been observed to make re changes in swimming depths (Westerberg, 1982; Reddin <i>et al.</i> , 2006). Given their propensity to dive both adult smolts may be exposed to EMF produced by the operational cables installed as part of the Proposed Developm
Couloir des trois Baie de Seine Orientale		The effects of EMF on salmon was studied by Armstrong <i>et al.</i> (2015) who exposed captive salmon to EMF. The that there was no identifiable behavioural response from salmon to a magnetic field of 95 µT. This magnetic field double than that predicted for the Proposed Development (42µT) so no behavioural response is expected. In ad surface and pelagic nature of both salmon and smolts suggests they do not spend a great deal of time on or near and therefore exposure to the low levels of EMF predicted is unlikely but if it does occur it will be of short duration across the cables.
		alone, will not lead to a LSE on the Salmon from the River Itchen SAC, River Avon SAC, Baie de Canche et Cou Estuaires SAC and Baie de Seine Orientale SAC.
	Temperature Change	Heat is generated as electricity passes through cables as a result of the resistance of the conductor material. It i during operation a small amount of heat will be produced by the Proposed Development.
		The effect of heat from subsea cables on salmon is not well documented however a study undertaken for the Net (Nemo Link, 2013) cable calculated that localised temperature increases in the seabed above the cable would o 0.3 m depth and 0.7°C at 0.1 m depth from the sea bed surface. The cables for the Proposed Development will minimum depth of 0.6 m with this in mind it is unlikely any substantial temperature increase will be detectable at addition, salmon (and smolts) generally swim near to the sea surface so interaction with any heat, albeit extreme the Proposed Development is unlikely.
		Given the minimal emission of heat expected which is expected to have little to no effect on salmon this impact LSE on the River Itchen, River Avon, Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale

# Table 7.3 - LSE Assessment for Salmon during Operation (including Repair and Maintenance)



	Potential for LSE? Y/N
predicted field les being 1 m.	N
ea (Godfrey <i>et a</i> l., regular rapid t salmon and ment.	
he results showed eld is more than addition, the sea ear the seabed ion while transiting	
d Development ouloir des trois	
t is expected that	Ν
Nemo link HVDC only be 1.2°C at Il be buried to a at the seabed. In nely small, from	
t will not lead to le.	

WSP/Natural Power



## Allis Shad and Twaite Shad

- 7.2.2.8. Both allis and twaite shad have almost identical physiology and exhibit similar biological traits such as being migratory and spawning in freshwater. As the same potential effects are identified for both species they have been assessed together in the following section.
- 7.2.2.9. Allis shad are an interest feature of a number of SACs where connectivity may exist with the potential effects identified for the Proposed Development. Twaite shad are also a feature of two French SACs. All SACs within the study area which list twaite and/or allis shad as qualifying features are listed below:
  - Plymouth Sound and Estuaries SAC (allis shad);
  - Baie de Canche et Couloir des trois Estuaires SAC (allis shad);
  - Baie de Seine Orientale SAC (both allis and twaite shad); and
  - Littoral Cauchois SAC (twaite shad).
- 7.2.2.10. There is some evidence that this species returns to its natal river to spawn with some genetic integrity (Quignard *et al.*, 1991) with Martin *et al.* (2015) showing a high level of site fidelity for these species. It is likely therefore that individual allis and twaite shad are destined for a particular catchment or SAC.
- 7.2.2.11. Effects for which both shad species have been identified as potentially sensitive (Table 7-4) for both the construction (and decommissioning) and also operational (Repair and Maintenance) phases of the Proposed Development (Table 7-5) are as follows:
- 7.2.2.12. Construction (and decommissioning)
  - Increased SSC;
  - Physical injury;
  - Invasive species;
  - Pollution events;
  - Noise and vibration; and
  - Visual disturbance.
- 7.2.2.13. Operation (repair and maintenance)
  - Increased SSC;
  - Physical injury;
  - Invasive species;
  - Pollution events;
  - Noise and vibration;



- EMF; and
- Temperature changes.
- 7.2.2.14. Once installation is complete the buried (or protected) cables will have a life expectancy of at least 40 years. The Proposed Development has been designed so that routine maintenance to the Marine Cables is not required during their operational lifetime. However, there may be the requirement to undertake unplanned repair works. Therefore, during the operation phase of the Proposed Development, the effects are expected to be no greater than that of the construction phase.
- 7.2.2.15. Where those effects assessed are not considered to lead to LSE on the features of this site during construction (or decomisioning), they will not be assessed again for operation as it is considered that no LSE will arise. Two additional effects relevant to shad and specific to the operational phase of a power cable are EMF and temperature changes, and these effects will be assessed accordingly.

SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
Allis shad: Plymouth Sound and Estuaries SAC Baie de Canche et Couloir des trois Estuaires ZSC Baie de Seine Orientale ZSC Twaite shad: Baie de Seine Orientale ZSC Littoral Cauchois ZSC	Increased SSC	The potential impact of increased SSC relates to the sediment released as a result of the burial of the cable and associated works such as dredging (both offshore and at Landfall), the deposit of dredge material, route clearance and rock placement. The worst case for increased SSC is considered to arise through deposit of dredge material which may be required for sandwave clearance, prior to cable installation. During dredge disposal, peak SSC of 1000 mgl <sup>-1</sup> could arise within 1 km from the release point but coarser sediment expected to fall out of suspension quickly (almost immediately) with significant reductions of SSC within hours of disposal at each location. Beyond 1 km from release, the passive plume which is transported beyond this is likely to generate SSC in the region of approximately 20 mgl <sup>-1</sup> , transported in the direction of the prevailing flow out to a distance of c. 25km. SSC is predicted to reduce to background levels (<1 – 6 mg/l) within the timeframe of a few days following completion of disposal activities. Shad are known to be present in all ICES rectangles in the Channel with numbers identified in commercial fisheries data. This is likely to include both allis and twaite shad. Given their wide dispersal within the Channel they are potentially at risk from increased SSC from the Proposed Development both coastally and offshore. SSC could pose a barrier to their migration or respiratory effects from depleted oxygen. Publicly available literature on the effects of suspended sediment on both shad species is scarce however Kjelland <i>et al.</i> (2015) identified that fish in general are more likely to undergo sub lethal stress from SSC as they have the ability to move away from the impacted area. In addition, both shad species spawn in a riverine environment so will be inherently tolerant of through areas of elevated sediment with minimal impact on their migration. With this in mind and considering the relatively localised (peak SSCs are experienced within 1 km from disposal event) and short and t	Ν
	Physical injury	The construction (operation & maintenance and decommissioning) phase of the Proposed Development will require the use of construction vessels which may pose a collision risk to allis and twaite shad. It is considered however that as both allis and twaite shad are highly mobile and therefore have the ability to avoid areas of increased vessel traffic (which are predicted to be relatively low when compared to background levels of traffic in the Solent area), and the potential for physical injury to occur is extremely low. Although a potential route to impact technically exists, the likelihood is predicted to be very low and the effects are predicted to be negligible. Therefore, it is considered that the Proposed Development alone, will not lead to a LSE on the Plymouth Sound and Estuaries SAC, Baie de Canche et Couloir des trois Estuaires SAC, Baie de Seine Orientale SAC and Littoral Cauchois SAC.	Ν
	Invasive species	The introduction of invasive species can be harmful to indigenous populations in locations where they do not naturally occur. As a number of vessels will be required for the installation (and pre installation) of the cable there is the possibility that invasive species may be introduced via biofouling or ballast water which are harmful to allis and twaite shad. The introduction of non-native migratory fish species has the potential to increase competition for spawning grounds, predate on eggs or juvenile domestic allis and twaite shad stocks and potentially reduce recruitment. In addition, the introduction of non-native parasites could also have negative effects on allis and twaite shad stocks. Maitland (2003) highlighted that rainbow	Ν



SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
		trout (Oncorhynchus mykiss) which have escaped from fish farms can be an issue in allis and twaite shad rivers, however there is no publicly available literature on vessel born non-native species which are specifically harmful to allis and twaite shad. This is also true for non-native parasites.	
		Although unlikely it is possible that non-native species may be introduced as a result of installation vessels operating in the near and offshore sections of the Proposed Development, however it is highly unlikely that any of these will be harmful to both allis and twaite shad. It is considered therefore that the potential introduction of non-native species will not lead to an LSE on the Plymouth Sound and Estuaries SAC, Baie de Canche et Couloir des trois Estuaires SAC, Baie de Seine Orientale SAC and Littoral Cauchois SAC.	
	Pollution Events	Pollution as a result of installation (operational and decommissioning) activities such as litter and contamination (hydrocarbons, Pesticides and PAHs), pesticides, anti-foulants, pharmaceuticals, transition elements and organo-metals) from installation vessels and release of liquids (bentonite) from HDD operations may have effects on allis and twaite shad whilst they are migrating to or from their natal rivers. As LSE cannot be fully ruled out this effect will be progressed to AA stage.	Y
		Historic pollution in the form of contaminated sediments (i.e. transition elements and organo-metals) as a result of re- suspension is not considered to have the potential to lead to LSE as the area is not highly contaminated.	
	Noise and vibration	The impact of noise and vibration may occur as a result of cable installation (and decommissioning) activities (cable laying and cable protection) and Landfall activities (HDD, vibro hammering/pile driving of four 36" steel casings and support lattices).	Ν
		Although no noise emissions for the Proposed Development are available Nedwell <i>et al.</i> (2003) found that the noise emitted from cable trenching at North Hoyle OWF was 123 dB re 1 µPa (at a range of 160 m).	
		In terms of noise and vibration from Landfall activities Nedwell <i>et al.</i> (2012) found that underwater noise monitoring of HDD operating 39 m below a river resulted in levels of 129.5 dB re 1 µPa on the river bed and Nedwell <i>et al.</i> (2003) found no discernible increase in underwater noise from an active vibropiling rig at a distance of 417.4m against the background noise of Town Quay, Southampton.	
		Both allis and twaite shad are a member of the herring family (Clupeidae) and are considered to be hearing specialists due to the coupling of the ear to the swim bladder. Mann et al, (2001) suggests this species has a hearing range between 10 Hz and 180 kHz. Popper <i>et al.</i> (2014) recommended guidelines for shipping and other continuous noises, with cable laying, HDD and vibropiling considered to fall within this category. Fish with a swim bladder involved in hearing (primarily pressure detection), such as allis and twaite shad, were assigned a low risk to mortality and potential mortal injury. In addition, recoverable injury may occur at 170 dB re 1 µPa for 48 hours and temporary threshold shift ('TTS') at 158 dB re 1 µPa for 12 hours from continuous sound sources.	
		When comparing the expected noise levels from cable trenching (as identified by Nedwell <i>et al.</i> , 2003) and HDD with the guidelines by Popper <i>et al.</i> (2014) the risk of recoverable injury or TSS will only occur if an individual is closer than 160 m to the source for a period of hours. As both shad species are highly mobile and capable of hearing underwater noise, they are likely to move away from the impact before injury or TTS occurs. In addition, allis and twaite shad are generally pelagic and unlikely to be in proximity to the sea bed, where cable trenching will occur, for any length of time.	
		In light of this the potential impact of noise and vibration form both cable installation and Landfall activities will not lead to an LSE on the Plymouth Sound and Estuaries SAC, Baie de Canche et Couloir des trois Estuaires SAC, Baie de Seine Orientale SAC and Littoral Cauchois SAC.	



SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
	Visual Disturbance	The impact of visual disturbance during installation (and decommissioning) to both allis and twaite shad could potentially occur due to the increase in vessels on the sea surface, installation equipment on the sea bed (grapnels, displacement ploughs, trenching tools) and attachment lines.	Ν
		Allis and twaite shad, like most fish, are highly adapted to detect changes in the visual environment with visual stimuli such as vessels potentially evoking a disturbance response which may incur unnecessary stress and use of energy. The common reaction to a potentially harmful situation is to escape and gain distance from the source with fish this is often presented by fleeing to deeper water (Ali, 1961). Flight behaviours are characterised by fast-start swimming which is a high energy burst and rapid acceleration in swimming speed usually away from the disturbance (Domenici and Blake, 1997). The duration of response and therefore stress, is a reflection of the potential risk versus the cost of avoidance with stress levels increasing dependent on the time the fish is exposed to the stimuli (Endler, 1991).	
		There is limited (if any) literature on the effects of visual disturbance from vessels on both species of shad. It is however considered that they will exhibit a similar response to most fish which is to navigate around or under the vessel. The effects of this are unlikely to be stressful with the Solent being a busy shipping area and both species of shad likely to be habituated to such disturbance.	
		In light of this the potential impact of noise and vibration will not lead to an LSE on the Plymouth Sound and Estuaries SAC, Baie de Canche et Couloir des trois Estuaires SAC, Baie de Seine Orientale SAC and Littoral Cauchois SAC.	



Table 7.5 - LSE Assessment for allis and twaite shad during Operation (including I	Repair and Maintenance)
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SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
Allis Shad: Plymouth Sound and Estuaries SAC Baie de Canche et Couloir des trois Estuaires ZSC Baie de Seine Orientale ZSC Twaite Shad: Baie de Seine Orientale ZSC Littoral Cauchois ZSC	EMF	The potential impact of EMF could occur as a result of the operation of the Proposed Development. The predicted field strength for EMF around the cables is 42 µT at 1 m depth. As this is the minimum buried depth of the cables thus far proposed this is considered to be the worst case. Publicly available literature on the effects of EMF on both species of shad is scarce (or non-existent). Elasmobranches on the other hand are known to be electroreceptive due to the presence of Ampullae of Lorenzini which allow this group of fishes to detect very weak voltage gradients which are used for prey detection. Both allis and twaite shad do not possess ampullary organs but rely on sight and sensory detection to find prey. They are also pelagic and do not depend on the seabed for feeding and are therefore unlikely to be exposed to EMF from the Proposed Development. In light of the above, the potental impact of EMF will not lead to LSE on the Plymouth Sound and Estuaries SAC, Baie de Canche et Couloir des trois Estuaries SAC, Baie de Seine Orientale SAC and Littoral Cauchois SAC.	Ν
	Temperature Change	Heat occurs during the transport of electricity through cables as a result of the resistance of the conductor material. It is expected that during operation a small amount of heat will be produced by the Proposed Development. There is little (if any) publicly available literature on the effects of heat from subsea cables on both species of shad. However, Hundt <i>et al.</i> (2015) investigated the effect of heat on larval stages of allis and twaite shad in freshwater which showed that optimal temperatures for growth performance was between 24 ° C and 28 ° C. Although this relates to freshwater, the larval stages of fish are often the most sensitive to any impact with adults likely to be more tolerant. A study undertaken for the Nemo link HVDC (Nemo Link, 2013) cable calculated that localised temperature increases in the seabed above the cable would only be 1.2°C at 0.3 m depth and 0.7°C at 0.1 m depth from the sea bed surface. The cables for the Proposed Development will be buried to a minimum depth of 1 m with this in mind it is unlikely any substantial temperature increase will be detectable at the sea bed. In addition, allis and twaite shad generally swim near to the sea surface so interaction with any heat, albeit extremely small, from the Proposed Development is unlikely. Given the minimal emission of heat expected which is expected to have little to no effect on allis and twaite shad this impact will not lead to LSE on the Plymouth Sound and Estuaries SAC, Baie de Canche et Couloir des trois Estuaires SAC, Baie de Seine Orientale SAC and Littoral Cauchois SAC.	Ν





### Sea Lamprey and Liver Lamprey

- 7.2.2.16. Both sea and river lamprey have similar physiology and exhibit similar biological traits such as being migratory and spawning in freshwater. As the same potential effects are identified for both species they have been assessed together in the following section.
- 7.2.2.17. Sea lamprey and river lamprey are an interest feature of a number of SACs where connectivity may exist with the potential effects identified for the Proposed Development. All SACs within the study area which list sea lamprey and/or river lamprey as qualifying features are listed below:
  - River Avon (sea lamprey);
  - River Axe (sea lamprey);
  - Littoral Cauchois (sea lamprey and river lamprey);
  - Estuaires et Littoral Picards (Baies de Somme et d'Authie) (river lamprey);
  - Baie de Canche et Couloir des trois Estuaires (sea lamprey and river lamprey); and
  - Baie de Seine Orientale SAC (sea lamprey and river lamprey).
- 7.2.2.18. Sea lamprey show limited site fidelity which is thought to be due to its parasitic adult life phase as cohorts become widely dispersed through transport by the diverse range of species they parasitize (Waldman *et al.*, 2008). There is therefore no way of attributing individuals to specific SACs. Despite this novel approach to spawning site selection sea lamprey belong to the same species and are therefore sensitive to the same effects regardless of the SAC for which they are qualifying feature.
- 7.2.2.19. River lamprey on the other hand are generally considered to use estuaries and coastal environments during their adult stages however the degree of spawning site fidelity is unknown.
- 7.2.2.20. Effects for which both sea and river lamprey have been identified as potentially sensitive (Table 7-6) for both the construction (and Decommissioning) and also operational (Repair and Maintenance) phases of the Proposed Development (Table 7-7) are as follows:
- 7.2.2.21. Construction (and decommissioning)
  - Increased SSC;
  - Physical injury;
  - Invasive species;
  - Pollution events; and
  - Noise and vibration.



- 7.2.2.22. Operation (repair and maintenance)
  - Increased SSC;
  - Physical injury;
  - Invasive species;
  - Pollution events;
  - Noise and vibration; and
  - EMF.
- 7.2.2.23. Once installation is complete the buried (or protected) cables will have a life expectancy of at least 40 years. The Proposed Development has been designed so that routine maintenance to the Marine Cables is not required during their operational lifetime. However, there may be the requirement to undertake unplanned repair works. Therefore, during the operation phase of the Proposed Development, the effects are expected to be no greater than that of the construction phase.
- 7.2.2.24. Where those effects assessed are not considered to lead to LSE on the features of this site during construction (or decomisioning), they will not be assessed again for operation as it is considered that no LSE will arise. One additional effect relevant to lamprey species and specific to the operational phase of a power cable is EMF, and this effect will be assessed accordingly.

SAC/ZSC	Effect	Assessment
Sea Lamprey:	Increased SSC	The potential impact of increased SSC relates to the sediment released as a resul installation and associated works such as dredge and disposal activities, route cle
River Avon SAC		rock placement for both the Marine Cable Corridor and Landfall.
River Axe SAC		Lamprey are known to use the coastal waters and there is the possibility that an
Littoral Cauchois ZSC		could pose a barrier to their migration or cause respiratory effects from depleted o
Baie de Canche et Couloir des trois Estuaires ZSC		cannot be fully ruled for the River Axe and River Avon, this impact will be progress stage.
Baie de Seine Orientale ZSC		Due to the distance between the French sites, it is not considered that increases in result in any significant effect on the qualifying features e.g. barrier effects.
River Lamprey:		
Littoral Cauchois ZSC	Physical injury	The construction (and decommissioning) phase of the Proposed Development will use of construction vessels which may pose a collision risk to lamprey. It is consid
Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC		that given lampreys (both adult and transformers) are highly mobile and therefore innate ability to avoid areas of increased vessel traffic the possibility of this impact
Baie de Canche et Couloir des trois		low.
Estuaires ZSC		Although a potential route to impact exists this will not lead to LSE River Avon SAC, Littoral Cauchois SAC, Estuaires et Littoral Picards (Baies de Somme et d'A
Baie de Seine Orientale ZSC		Baie de Canche et Couloir des trois Estuaires SAC and Baie de Seine Orientale S
	Invasive species	The introduction of invasive species can be harmful to indigenous populations in lot they do not naturally occur. As a number of vessels will be required for the installa- installation) of the cable there is the possibility that invasive species may be introd biofouling or ballast water which are harmful to both sea and river lamprey.
		The introduction of non-native migratory fish species has the potential to increase spawning grounds with domestic lamprey stocks and potentially reduce recruitmen the introduction of non-native parasites could also have negative effects on lampre There is no publicly available literature on vessel born non-native species which a harmful to lamprey. In addition, only a few parasites have been recorded from lam nothing is known about their effect (Maitland, 2003).
		Although unlikely it is possible that non-native species may be introduced as a resinstallation vessels operating in the near and offshore sections of the Proposed Dehowever it is highly unlikely that any of these will be harmful to sea and river lamps considered therefore that the potential introduction of non-native species will not le River Avon SAC, River Axe SAC, Littoral Cauchois SAC, Estuaires et Littoral Pica Somme et d'Authie) SAC, Baie de Canche et Couloir des trois Estuaires SAC and Orientale SAC.
	Pollution Events	Pollution as a result of installation (operational and decommissioning) activities su contamination (hydrocarbons, Pesticides and PAHs), pesticides, anti-foulants, pha transition elements and organo-metals) from installation vessels and release of liq (bentonite) from HDD operations may have effects on lamprey (and transformers)



	Potential for LSE? Y/N
sult of the cable clearance and n increase in SSC d oxygen. As LSE essed to AA s in SSC will	Y (UK sites only)
will require the sidered however are have the act is extremely SAC, River Axe	Ν
d'Authie) SAC, e SAC.	
n locations where allation (and pre- oduced via	Ν
se competition for nent. In addition, prey stocks. n are specifically ampreys and	
result of Development, mprey. It is ot lead to LSE icards (Baies de and Baie de Seine	
such as litter and pharmaceuticals, liquids rs) whilst they are	Y

SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
		<ul> <li>migrating to or from freshwater. As LSE cannot be fully ruled out this effect will be progressed to AA stage.</li> <li>Historic pollution in the from of contaminated sediments (i.e. transition elements and organometals) is not considered to have the potential to lead to LSE i.e. as a result of re-suspension, as the area is not highly contaminated.</li> </ul>	
	Noise and vibration	The impact of noise and vibration may occur as a result of cable installation (and decommissioning) activities (cable laying and cable protection) and Landfall activities (HDD, vibro hammering/pile driving of four 36" steel casings and support lattices).	Ν
		Lamprey are considered to be hearing generalists, with a maximum hearing range of no more than several hundred Hz (Popper, 2005). Therefore, behavioural or physiological effects on lamprey are considered to only occur when the organism is very close to a powerful noise source (Popper, 2005; Popper and Hastings 2009). A powerful noise source could be produced by piling however no piling will be required for the Proposed Development with the loudest source of noise expected to be from mechanical trenching (123 dB re 1 µPa at a range of 160 m).	
		Popper <i>et al.</i> (2014) recommended guidelines for shipping and other continuous noises, with cable laying, vibro piling and HDD considered to fall within this category. Fish with no swim bladder (particle motion detection), such as sea lamprey, were assigned a low risk to mortality, potential mortal injury and recoverable injury near to the source from continuous sound sources.	
		Given that lamprey have a low sensitivity to noise and vibration they are at low risk from mortality and mortal injury as a result of trenching operations, HDD and vibropiling it is considered that this impact will not lead to LSE on the river Avon, river Axe, Littoral Cauchois, Estuaires et Littoral Picards (Baies de Somme et d'Authie), Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale SAC.	



SAC/ZSC	Effect	Assessment	Potential for LSE? Y/N
Sea Lamprey: River Avon River Axe Littoral Cauchois Baie de Canche et Couloir des trois Estuaires Baie de Seine Orientale	EMF	The potential impact of EMF could occur as a result of the operation of the Proposed Development. The predicted field strength for EMF around the cables is $42 \ \mu$ T at 1 m depth. As this is the minimum buried depth of the cables thus far proposed this is considered to be the worst case. The effects of EMF on lamprey is not well documented. Elasmobranches on the other hand are known to be electroreceptive due to the presence of Ampullae of Lorenzini which	Ν
River Lamprey: Littoral Cauchois Estuaires et Littoral Picards (Baies de Somme et d'Authie) Baie de Canche et Couloir des trois Estuaires		allow this group of fishes to detect very weak voltage gradients. Lamprey also possess ampullary organs on their heads and bodies. Brodznick <i>et al.</i> (1983) showed that these are sensitive to weak, low frequency electric fields. However, there is no evidence that lampreys respond to magnetic B fields and no responses to cable induced electric fields have been recorded.	
Baie de Seine Orientale		Lamprey utilise both the pelagic and benthic zones whilst at sea and coastally (and in estuaries) (Hardisty, 1986). It is therefore possible that on their spawning migration back to freshwater they will encounter low levels (42 $\mu$ T at the seabed) of EMF from the Proposed Development. However, given that that there is no evidence that shows a behavioural response from these species to EMF from cables their migration is unlikely to be affected.	
		It is considered that EMF as a result of the Proposed Development will not lead to LSE on the River Avon, River Axe, Littoral Cauchois, Estuaires et Littoral Picards (Baies de Somme et d'Authie), Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale ZSCs.	

# Table 7.7 - LSE Assessment for Sea lamprey and River lamprey during Operation (including Repair and Maintenance)



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## 7.2.3. MARINE MAMMALS

- 7.2.3.1. This section considers the potential for LSE from the effects identified in Section 6 on the marine mammal species identified in Section 4. Information from the ES has been used to inform the LSE screening assessment which is presented in Table 7-8.
- 7.2.3.2. The seven pre-screened in European designated sites (i.e. those with which there is potential for connectivity) identified in Section 6 have been grouped and considered together for each species. The species have also been grouped and considered together for each effect because there is little difference in susceptibility between species.
- 7.2.3.3. As summarised in Table 7-8 below, it is concluded that there is no LSE for the Proposed Development alone for any of the marine mammal features for any of the SACs identified as part of this HRA from the following potential effects: auditory injury, disturbance, collision and indirect effects.
- 7.2.3.4. The potential for pollution events to have LSE cannot be ruled out therefore pollution has been taken through to the next stage of the assessment (see Section 10).

Table 7.8 - Assessment of LSE on Natura 2000/Ramsar marine mammal features resulting from the Proposed Development alone. This assessment relates to all phases of the project (i.e. construction, operation and decommissioning) unless otherwise stated

Effect	Species	Relevant SACs/ZSC	LSE?	Justification
Auditory injury	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC	N	Noise from use of geophysical survey and The sound emitted by some geophysical s the potential to induce the onset of permar
	Harbour porpoise	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	injury, at very close range (i.e. within 1 m) Oceanic and Atmospheric Administration ( used; see Section 10.6.1 of Chaper 10 the As animals are very unlikely to occur at ve of the vessels carrying the equipment, it is potential for the sound emitted by geophys
	Grey seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	to induce the onset of PTS. <u>Noise from seabed preparation work, cable</u> The M-weighted sound exposure level ('SI (PTS onset) is predicted to occur for noise work, cable installation activities and vesse metre (Inchcape Offshore Limited ('ICOL'))
	Harbour seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	There is therefore negligible potential for a noise from the proposed seabed preparati and vessels (see Section 10.3.2 of Chapte approach used). <u>Noise from HDD work (construction phase</u> Due to the very low levels of noise measur 2012), there is considered to be negligible onset; see Section 10.3.2 of Chapter 10 of used). <u>Noise from potential vibro-hammering and (construction phase only)</u> : Due to the low levels of noise emitted by ty the potential for auditory injury (PTS onset (NOAA (2018) PTS onset thresholds used the ES for detail of the approach used). <b>Therefore, no LSE as a result of auditor</b> <b>dolphin, harbour porpoise, grey seal an</b> <b>Proposed Development alone</b> .
Disturbance	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC	Ν	Noise from use of geophysical survey and



d positioning equipment: survey and positioning equipment has anent threshold shift ('PTS'), i.e. auditory h) if source levels are high (National ('NOAA') (2018) PTS onset thresholds ne ES for detail of the approach used).

very close range, i.e. within a few metres is considered that there is negligible vsical survey and positioning equipment

ole installation activities and vessels: SEL') ranges out to which auditory injury se from the proposed seabed preparation sels are predicted to be less than one '), 2013; Natural Power, 2018).

auditory injury as a result of increased tion work, cable installation activities ter 10 of the ES for detail of the

e only): ured during HDD work (Nedwell et al., le potential for auditory injury (PTS of the ES for detail of the approach

d sheet piling at the HDD locations

typical EMV and pipe driving machines, et) is considered to be nil even at source d; see Section 10.6.1 of Chapter 10 of

ory injury is concluded for bottlenose and harbour seal as a result of the

d positioning equipment:

WSP/Natural Power

Effect	Species	Relevant SACs/ZSC	LSE?	Justification
		Baie de Seine orientale ZSC		The sound emitted by some geophysical su
	Harbour porpoise	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	the potential to disturb marine mammals if within their hearing range. Although there i small number of individuals, any effects are reversible (animals are likely to return to af documented by Thompson <i>et al.</i> , 2013) wit being available in the meantime. Given the the vicinity of the Proposed Development, the
	Grey seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	Noise from seabed preparation work, cable Disturbance ranges as a result of increased activities and vessels proposed are likely to Natural Power, 2018). There is therefore ne disturbance as a result of noise from the pr Furthermore, any effects are likely to be ter
	Harbour seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC Estuaire de la Seine ZSC	N	alternative local habitat being available in the Noise from HDD work (construction phase noise measured during HDD work (Nedwell be negligible potential for disturbance. Noise from potential vibro-hammering and (construction phase only): Due to the low levels of noise emitted by ty the potential for disturbance in response to negligible. <u>Presence of EMF (operational phase only)</u> : The potential effects of the presence of EMF responses. Any changes to swimming behave the mean of the presence of EMF are likely to be corrected within a few temporary) and therefore have minimal effects is therefore negligible potential for significant presence of EMF. <u>Disturbance of seals hauled out (construction disturbance of seals hauled out at locations to in air noise is nil due to the distance between the sites (53-104 km; see Table 6-5).</u> Therefore, no LSE as a result of disturbation of the second presence of the



survey and positioning equipment has if the frequency/frequencies used fall is potential for disturbance of a very are predicted to be temporary and affected sites within a few hours as with suitable alternative local habitat he low abundance of marine mammals in there is considered to be negligible

ele installation activities and vessels: ed anthropogenic noise from the to be small (<1 to 140 m; ICOL, 2013; negligible potential for significant proposed work/activities and vessels. emporary and reversible with suitable the meantime.

<u>e only</u>): Due to the very low levels of rell *et al.*, 2012), there is considered to

## d sheet piling at the HDD locations

typical EMV and pipe driving machines, to underwater noise is considered to be

):

MF include temporary behavioural haviour as a result of the presence of w metres (i.e. be very small scale and ffect (Normandeau *et al.*, 2011). There ant disturbance as a result of the

tion phase only): The potential for ns within these seven sites in response tween the Proposed Development and

bance is concluded for bottlenose nd harbour seal as a result of the

WSP/Natural Power

Effect	Species	Relevant SACs/ZSC	LSE?	Justification		
Collision	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC	N	Vessel strikes are a known cause of mortal for subsequent infection) in marine mamma species under consideration are considered		
	Harbour porpoise	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	whales and have been shown to avoid ship Due to the nature of the Proposed Develop following a pre-defined linear route when w vessels will either be stationary, travelling a transiting in a predictable manner. Therefor their path and avoid them, which will great		
	Grey seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	addition, any animals present will already b vessel movements present in the study are movements/day in summer and 300 vessel Chapter 13 Shipping, Navigation and Other document reference 6.1.13). Therefore, the resulting from collisions is considered to be <b>Therefore, no LSE as a result of collision</b>		
	Harbour seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Ν	dolphin, harbour porpoise, grey seal a Proposed Development alone.		
Indirect effects	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC	Ν	Indirect effects such as changes in suspend construction (operation and decommissioni activities (such as dredging/MFE) have the		
porpois	Harbour porpoise	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	N	availability/quality and alter marine mamm therefore fitness. However, marine mammals are recorded suspension levels are high, such as estua for foraging (Bailey and Thompson, 2010) visual cues to hunt (they use echolocation		
	Grey seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	N	hydrodynamic stimuli through their whiskers and sound (Dehnhardt <i>et al.</i> , 1998; 2001), i will continue to forage in areas of high sedin other than visual ones. It is also predicted to Proposed Development will reduce down to so any potential effects would only be short		



ality and physical injury (with potential nals, particularly large whales. The ed to be more agile than the large ips e.g. Palka and Hammond (2001).

opment, the large vessels will be working and the small to medium sized at low to moderate working speeds or ore, it will be easy for animals to predict atly reduce the risk of collision. In be habituated to the high levels of rea (which is *circa* 450 vessel el movements/day in winter (see er Marine Users of the ES Volume 1, he potential for signicant effects be negligible.

### ons is concluded for bottlenose nd harbour seal as a result of the

nded sediment levels as a result of ning) including seabed preparation re potential to affect prey nal foraging behaviour/success and

foraging in areas where sediment aries, and may in fact target such areas ). Because cetaceans do not rely on n) and seals are sensitive to ers rather than relying solely on sight ), it is expected that marine mammals diment load, relying on sensory cues d that increases in SSC as a result of the to background levels within a few days ort term and temporary.

WSP/Natural Power

Effect	Species	Relevant SACs/ZSC	LSE?	Justification
	Harbour seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	N	Furthermore, because marine mammals rathabitats, any short-term local level changes to result in a reduction in fitness or breedin Therefore, no LSE as a result of indirect dolphin, harbour porpoise, grey seal and Proposed Development alone.
Pollution	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC	Y	Potential pollution as a result of the Proposibroad types: Contamination as a result of u disposal of litter.
	Harbour porpoise Grey seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Y	Pollution may have short-term/direct effects is affected as a result of an unplanned spill (Kastelein and Lavaleije, 1992) or animals (Baulch and Perry, 2014). Pollution may also have long-term/indirect
		Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Y	contaminated prey items are ingested. Bec apex predators, bioaccumulation as a resu items may occur (Wells <i>et al.</i> , 2005). This r reduced reproductive success. Historic pollution in the form of contaminate and organo-metals) is not considered to have resuspension of sediments, to a LSE as the
	Harbour seal	Récifs Gris-Nez Blanc-Nez ZSC Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC Baie de Canche et couloir des trois estuaires ZSC Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar Littoral Cauchois ZSC Baie de Seine orientale ZSC Estuaire de la Seine ZSC	Y	contaminated. Therefore, the potential for pollution to dolphin, harbour porpoise, grey seal an Proposed Development alone cannot be been taken through to the next stage of



range widely and forage in a variety of es in prey availability/quality are unlikely ing success.

ect effects is concluded for bottlenose and harbour seal as a result of the

bsed Development may be split into two funplanned spills and the unplanned

cts on marine mammals if water quality ill (Lane *et al.*, 2015), litter is ingested s become entangled in marine debris

t effects on marine mammals if ecause marine mammals are long-lived sult of ingestion of contaminated prey may lead to health issues such as

ated sediments (i.e. transition elements have the potential to lead i.e. through the area is not considered to be highly

o result in a LSE on bottlenose nd harbour seal as a result of the be ruled out therefore pollution has of the assessment (see Section 10).

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### 7.2.4. MARINE ORNITHOLOGY

7.2.4.1. An assessment of LSE on designated marine ornithological features during the construction, operation and decommissioning phases of the Proposed Development is provided in Table 7-9.

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
Solent and Dorset Coast pSPA	Disturbance and displacement	Little tern	Y	Foraging little terns are considered to be of moderate sensiti (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014). Due to the (Parsons <i>et al.</i> , 2015), the presence of vessels and associat development may displace this feature from favoured foragin both visual disturbance and unpredictable noise events, part during construction.
		Sandwich tern	Ν	Foraging Sandwich terns are considered to be of low sensitive and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within the Solent where vessel traffic lev 2014; Natural England, 2016; Natural England, 2019c). It is due to the Proposed Development is low when compared to It is therefore considered that Sandwich terns will habituate the and associated activities during all phases of development.
		Common tern	Ν	Foraging common terns are considered to be of low sensitivi and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within the Solent where vessel traffic lev 2014; Natural England, 2016; Natural England, 2019c). It is due to the Proposed Development is low when compared to It is therefore considered that as the increase in traffic resulti low, common terns will habituate to the increased presence during all phases of development.
		Supporting habitat (water column)	Ν	Disturbance and displacement of prey species present within of development is considered to be negligible since it is likely Solent are accustomed to vessel traffic and the presence of commercial fishing vessels) and will simply navigate round of maintenance vessels. Any effects resulting from possible inconsidered to be of limited spatial extent and short lived (red
		Little tern	Y	Little terns are visual foragers (Parsons <i>et al.</i> , 2015) and are turbidity which can make it harder to see prey from the sease moderately sensitive to habitat disturbance and subsequent (Bradbury <i>et al.</i> , 2014). Increases in suspended sediment as works, cable burial activities and cable maintenance within the within this species' restricted foraging range.
		Sandwich tern	Y	Sandwich terns are visual foragers and are likely to be affect can make it harder to see prey from the sea surface. They a sensitive to habitat disturbance and therefore to potential eff 2014).

# Table 7.9 - Assessment of LSE on designated ornithological features as a result of the Proposed Development across all phases of development



itivity to disturbance from vessel traffic e species' restricted foraging range ated activities during all phases of ing habitat within this pSPA through inticularly in relation to HDD works

tivity to disturbance from vessel traffic by *et al.*, 2014). Indeed, Sandwich terns evels are already high (Wilson *et al.*, s considered that the increase in traffic o the existing vessel activity in the area. to the increased presence of vessels

vity to disturbance from vessel traffic ry *et al.*, 2014). Indeed, common terns evels are already high (Wilson *et al.*, s considered that the increase in traffic o the existing vessel activity in the area. Iting from the Proposed Development is e of vessels and associated activities

in the water column during all phases ely that fish species present in the of vessels towing equipment (e.g. or under any construction or increases in suspended sediment are educe to background levels within days).

re likely to be affected by an increase in a surface. They are considered to be at potential effects on prey species as a result of seabed preparation, HDD this pSPA may affect prey availability

cted by an increase in turbidity which are considered to be moderately effects on prey species (Bradbury *et al.*,

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				Increases in suspended sediment as a result of seabed prepactivities and cable maintenance within this pSPA may affect foraging range (Wilson <i>et al.</i> , 2014).
		Common tern	Y	Common terns are visual foragers and are likely to be affected can make it harder to see prey from the sea surface. They a sensitive to habitat disturbance and therefore to potential eff 2014). Increases in suspended sediment as a result of seab burial activities and cable maintenance within this pSPA may species' foraging range (Wilson <i>et al.</i> , 2014).
		Supporting habitat (water column)	Y	Increases in suspended sediment as a result of seabed prepactivities and cable maintenance may increase turbidity of the availability though changes in primary production by phytopla visual foraging features to see prey from the sea surface.
	Collision	Little tern	N	Structures or devices which have the potential to pose an ab will not be introduced during any development phase. Surface not considered to be vulnerable to below water collisions (Fu
		Sandwich tern	N	Structures or devices which have the potential to pose an at terns will not be introduced during any development phase. terns are not considered to be vulnerable to below water col
		Common tern	N	Structures or devices which have the potential to pose an all terns will not be introduced during any development phase. terns are not considered to be vulnerable to below water col
	INIS	Little tern	N	There is no pathway for activities associated with the Proposition non-indigenous predators (e.g. mink) to little tern breeding constrained in Chichester and Langstone Harbours.
		Sandwich tern	N	There is no pathway for activities associated with the Proposition non-indigenous predators (e.g. mink) to Sandwich tern breed will not be berthed in Chichester and Langstone Harbours.
		Common tern	N	There is no pathway for a construction work activities assoc to introduce invasive non-indigenous predators (e.g. mink) to since installation vessels will not be berthed in Chichester and
		Supporting habitat (water column)	Ν	Invasive species (e.g. Chinese mitten crabs, slipper limpets into the water column via biofouling or ballast water from ves habitat structure and those with versatile diets can cause de natives and therefore altering the community structure and f However, given that all three tern species predate on a rang herring and sprats which are highly mobile, it is highly unlike affected by localised changes in prey communities.



eparation, HDD works, cable burial ect prey availability within this species'

cted by an increase in turbidity which are considered to be moderately effects on prey species (Bradbury *et al.*, abed preparation, HDD works, cable ay affect prey availability within this

eparation, HDD works, cable burial this supporting habitat, altering prey blankton, as well as making it harder for

above water collision risk to little terns ace feeding species including terns are <sup>-</sup>urness *et al.*, 2012).

above water collision risk to Sandwich . Surface feeding species including pollisions (Furness *et al.*, 2012).

above water collision risk to common . Surface feeding species including ollisions (Furness *et al.*, 2012).

osed Development to introduce invasive colonies, since vessels will not be

osed Development to introduce invasive eding colonies, since installation vessels

to common tern breeding colonies, and Langstone Harbours.

s and Pacific oyster) may be introduced essels. Invasive species can affect detrimental impacts by outcompeting food chain (Orlova *et al.*, 2006). age of prey species including sandeels, kely that any of these species will be

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Little tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect little terns when in contac oiling resulting in mortality.
		Sandwich tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect Sandwich terns when in direct oiling resulting in mortality.
		Common tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect common terns when in co direct oiling resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned oil or chemical spillages from vessels may occur can cause sublethal impacts on juvenile fish growth and sur availability.
	Litter	Little tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect little terns when utilising the sea surface throug in mortality.
		Sandwich tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect Sandwich terns when utilising the sea surface resulting in mortality.
		Common tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect common terns when utilising the sea surface to resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned disposal of industrial or user plastic during all de directly affect prey species within the water column through mortality.
Chichester and Langstone Harbours SPA/Ramsar site	Disturbance and displacement	Red-breasted merganser	Y	Red-breasted merganser feed and roost on the water in both between October and March (Natural England, 2019a). This moderate sensitivity to disturbance (Bradbury <i>et al.</i> , 2014; G both visual disturbance and unpredictable noise events, par during construction in Langstone Harbour could result in dis temporary displacement.
		Little tern	Y	Foraging little terns are considered to be of moderate sensit (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014). Due to the (Parsons <i>et al.</i> , 2015), the increased presence of vessels ar phases of development may displace this feature from favou through both visual disturbance and unpredictable noise ever works during construction.



ur during all development phases. Spills act with the sea surface through direct

ur during all development phases. Spills n contact with the sea surface through

ur during all development phases. Spills contact with the sea surface through

ur during all development phases. Oil urvival, thus potentially affecting prey

development phases has the potential to ough ingestion or entanglement resulting

development phases has the potential to the through ingestion or entanglement

development phases has the potential to through ingestion or entanglement

development phases has the potential to h ingestion or entanglement resulting in

oth Chichester and Langstone Harbours is feature is considered to be of Gittings & O'Donoghue, 2016). As such, articularly in relation to HDD works isturbance of the feature and possible

sitivity to disturbance from vessel traffic e species' restricted foraging range and associated activities during all oured foraging habitat within this pSPA vents, particularly in relation to HDD

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Sandwich tern	N	Foraging Sandwich terns are considered to be of low sensiti- and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within Chichester and Langstone Harbo England, 2016; Natural England, 2019a). It is therefore cons habituate to the increased presence of vessels and associat development.
		Common tern	N	Foraging common terns are considered to be of low sensitive and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within Chichester and Langstone Harbo England, 2016; Natural England, 2019a). It is therefore cons habituate to the increased presence of vessels and associated development.
		Supporting habitat (water column)	N	Disturbance and displacement of prey species present within of development is considered to be negligible since it is likely Solent are accustomed to vessel traffic and the presence of commercial fishing vessels) and will simply navigate round of maintenance vessels.
	Indirect effects	Red-breasted merganser	Y	Red-breasted mergansers are visual foragers and are likely turbidity which can make it harder to see prey in the water co moderately sensitive to habitat disturbance and subsequent <i>al.</i> , 2014). Increases in suspended sediment as a result of s burial activities and cable maintenance may affect prey avail within Langstone and Chichester Harbours.
		Little tern	Y	Little terns are visual foragers and are likely to be affected be make it harder to see prey from the sea surface. They are con- habitat disturbance and therefore potential effects on prey (Be suspended sediment within Langstone Harbour as a result of addition to cable burial and maintenance activities outwith Langstone for aging range (Par
		Sandwich tern	Y	Sandwich terns are visual foragers and are likely to be affect can make it harder to see prey from the sea surface. They a sensitive to habitat disturbance and therefore potential effect Increases in suspended sediment within Langstone Harbour HDD works, in addition to cable burial and maintenance acti affect prey availability within this species' foraging range (W
		Common tern	Y	Common terns are visual foragers and are likely to be affected can make it harder to see prey from the sea surface. They a sensitive to habitat disturbance and therefore potential effect Increases in suspended sediment within Langstone Harbour



itivity to disturbance from vessel traffic iry *et al.*, 2014). Indeed, Sandwich terns bours (Wilson *et al.*, 2014; Natural nsidered that Sandwich terns will iated activities during all phases of

ivity to disturbance from vessel traffic iry *et al.*, 2014). Indeed, common terns bours (Wilson *et al.*, 2014; Natural nsidered that common terns will iated activities during all phases of

hin the water column during all phases ely that fish species present in the of vessels towing equipment (e.g. l or under any construction or

ly to be affected by an increase in column. They are considered to be nt potential effects on prey (Bradbury *et* seabed preparation, HDD works, cable ailability within favoured foraging areas

by an increase in turbidity which can considered to be moderately sensitive to (Bradbury *et al.*, 2014). Increases in to f seabed preparation, HDD works, in Langstone Harbour, may affect prey arsons *et al.*, 2015).

ected by an increase in turbidity which are considered to be moderately ects on prey (Bradbury *et al.*, 2014). ur as a result of seabed preparation, ctivities outwith Langstone Harbour, may Wilson *et al.*, 2014).

cted by an increase in turbidity which are considered to be moderately ects on prey (Bradbury *et al.*, 2014). ur as a result of seabed preparation,

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				HDD works, in addition to cable burial and maintenance acti affect prey availability within this species' foraging range (Wi
		Supporting habitat (water column)	Y	Increases in suspended sediment as a result of seabed prep activities and cable maintenance may increase turbidity of th availability though changes in primary production by phytopla visual foraging features to see prey from the sea surface.
	Collision	Red-breasted merganser	Ν	Structures or devices which have the potential to pose an ab will not be introduced during any development phase. Based that red-breasted mergansers are moderately sensitive to be devices within the water column associated with the Propose close proximity to an operating vessel. It is considered that re vessel operations and therefore the risk of below water collis
		Little tern	N	Structures or devices which have the potential to pose an ab will not be introduced during any phase of development. Sur are not considered to be vulnerable to below water collisions
		Sandwich tern	N	Structures or devices which have the potential to pose an ab terns will not be introduced during any phase of developmen terns are not considered to be vulnerable to below water coll
		Common tern	N	Structures or devices which have the potential to pose an atterns will not be introduced during any development phase. terns are not considered to be vulnerable to below water coll
	INIS	Little tern	N	There is no pathway for offshore construction work activities Development to introduce invasive non-indigenous predators colonies, since vessels will not be berthed in Chichester and
		Sandwich tern	N	There is no pathway for offshore construction work activities Development to introduce invasive non-indigenous predators breeding colonies, since vessels will not be berthed in Chich
		Common tern	N	There is no pathway for offshore construction work activities Development to introduce invasive non-indigenous predators colonies since vessels will not be berthed in Chichester and
		Supporting habitat (water column)	N	Invasive species (e.g. Chinese mitten crabs, slipper limpets into the water column via biofouling or ballast water from ves habitat structure and those with versatile diets can cause de natives and therefore altering the community structure and for However, given that all three tern species predate on a range herring and sprats which are highly mobile, it is highly unlike affected by localised changes in prey communities.



ctivities outwith Langstone Harbour, may Wilson *et al.*, 2014).

eparation, HDD works, cable burial this supporting habitat, altering prey plankton, as well as making it harder for

above water collision risk to this feature and on Furness *et al.*, (2012), it is likely below water collisions. Structures or osed Development will only be used in t red-breasted mergansers will avoid llision is negligible.

above water collision risk to little terns urface feeding species including terns ns (Furness *et al.*, 2012).

above water collision risk to Sandwich ent. Surface feeding species including ollisions (Furness *et al.*, 2012).

above water collision risk to common . Surface feeding species including ollisions (Furness *et al.*, 2012).

es associated with the Proposed ors (e.g. mink) to little tern breeding nd Langstone Harbours.

es associated with the Proposed ors (e.g. mink) to Sandwich tern chester and Langstone Harbours.

es associated with the Proposed ors (e.g. mink) to common tern breeding ad Langstone Harbours.

is and Pacific oyster) may be introduced ressels. Invasive species can affect detrimental impacts by outcompeting d food chain (Orlova *et al.*, 2006). Inge of prey species including sandeels, kely that any of these species will be

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
	Litter	Red-breasted merganser	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect red-breasted mergansers direct oiling resulting in mortality.
		Little tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect little terns when in contac oiling resulting in mortality.
		Sandwich tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect Sandwich terns when in direct oiling resulting in mortality.
		Common tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect common terns when in co direct oiling resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned oil or chemical spillages from vessels may occur can cause sublethal impacts on juvenile fish growth and sur availability.
		Red-breasted merganser	Y	Unplanned disposal of industrial or user plastic during all de directly affect red-breasted mergansers when utilising the se entanglement resulting in mortality.
		Little tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect little terns when utilising the sea surface throug in mortality.
		Sandwich tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect Sandwich terns when utilising the sea surface resulting in mortality.
		Common tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect common terns when utilising the sea surface to resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned disposal of industrial or user plastic during all de directly affect prey species within the water column through mortality.
Portsmouth Harbour SPA/Ramsar site	Disturbance and displacement	Red-breasted merganser	Ν	Red-breasted merganser feed and roost on the water in Por and April (Natural England, 2019b). This feature is considered disturbance (Bradbury <i>et al.</i> , 2014; Gittings & O'Donoghue, Proposed Development (including a rolling safe passage dis activities) and favoured foraging and roosting areas in Ports km) is considered to be sufficient as to ensure no significant breasted mergansers utilising this SPA (e.g. Schwemmer <i>et</i>



ur during all development phases. Spills ers utilising the sea surface through

ur during all development phases. Spills act with the sea surface through direct

ur during all development phases. Spills n contact with the sea surface through

ur during all development phases. Spills contact with the sea surface through

ur during all development phases. Oil urvival, thus potentially affecting prey

development phases has the potential to sea surface through ingestion or

development phases has the potential to ough ingestion or entanglement resulting

development phases has the potential to through ingestion or entanglement

development phases has the potential to e through ingestion or entanglement

development phases has the potential to hingestion or entanglement resulting in

Portsmouth Harbour between November ered to be of moderate sensitivity to e, 2016). The distance between the distance of 700 m for associated vessel rtsmouth Harbour (coastal distance of >5 ant disturbance or displacement of red*et al.*, 2011).

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Supporting habitat (water column)	N	Disturbance and displacement of prey species present within of development is considered to be negligible since it is likely Solent are accustomed to vessel traffic and the presence of commercial fishing vessels) and will simply navigate round of maintenance vessels.
	Indirect effects	Red-breasted merganser	Ν	Red-breasted mergansers are visual foragers and are likely turbidity which can make it harder to see prey in the water co moderately sensitive to habitat disturbance and to subseque (Bradbury <i>et al.</i> , 2014). Increases in suspended sediment as works, cable burial activities and cable maintenance is expe- to within comparable background concentrations within days Proposed Development and favoured foraging and roosting (coastal distance of >5 km), it is considered that there is no development phase.
		Supporting habitat (water column)	N	Increases in suspended sediment as a result of seabed prepactivities and cable maintenance are expected to be highly la availability in the water column at Portsmouth Harbour due to
	Collision	Red-breasted merganser	N	Structures or devices which have the potential to pose an ab will not be introduced during any development phase. Based that red-breasted mergansers are moderately sensitive to be devices within the water column associated with the Propose close proximity to an operating vessel. It is considered that re vessel operations and therefore the risk of below water collis
	INIS	Supporting habitat (water column)	Ν	Invasive species (e.g. Chinese mitten crabs, slipper limpets into the water column via biofouling or ballast water from ves habitat structure and those with versatile diets can cause de natives and therefore altering the community structure and fe However, given that all three tern species predate on a range herring and sprats which are highly mobile, it is highly unlike affected by localised changes in prey communities.
	Accidental spills	Red-breasted merganser	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect red-breasted mergansers through direct oiling resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned oil or chemical spillages from vessels may occur can cause sublethal impacts on juvenile fish growth and survavilability.
	Litter	Red-breasted merganser	Y	Unplanned disposal of industrial or user plastic during any d directly affect red-breasted mergansers when utilising the se entanglement resulting in mortality.



hin the water column during all phases ely that fish species present in the of vessels towing equipment (e.g. l or under any construction or

ly to be affected by an increase in column. They are considered to be uent potential effects on prey species as a result of seabed preparation, HDD bected to be highly localised and return ys. Given the distance between the g grounds in Portsmouth Harbour o potential for impact during any

eparation, HDD works, cable burial / localised and unlikely to alter prey e to distance.

above water collision risk to this feature ed on Furness *et al.*, (2012), it is likely below water collisions. Structures or osed Development will only be used in t red-breasted mergansers will avoid llision is negligible.

is and Pacific oyster) may be introduced vessels. Invasive species can affect detrimental impacts by outcompeting d food chain (Orlova *et al.*, 2006). nge of prey species including sandeels, kely that any of these species will be

ur during any development phase. Spills ers when in contact with the sea surface

ur during all development phases. Oil urvival, thus potentially affecting prey

development phase has the potential to sea surface through ingestion or

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Supporting habitat (water column)	Y	Unplanned disposal of industrial or user plastic during all de directly affect prey species within the water column through mortality.
•	Disturbance and displacement	Little tern	N	Important breeding areas within this SPA include Hurst Point sites including North Solent, Lymington to Pylewell, and New 2019c). Important foraging areas within this SPA include Hur Estuary off the Isle of Wight. Given that these areas are loca Development, it is considered that there is no potential for in based on the species' restricted foraging range (Parsons <i>et</i>
		Common tern	N	Foraging common terns are considered to be of low sensitivi and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within the Solent where vessel traffic lev 2014; Natural England, 2016; Natural England, 2019c). It is terns will habituate to the increased presence of vessels and phases of development.
		Sandwich tern	N	Foraging Sandwich terns are considered to be of low sensitive and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within the Solent where vessel traffic lev 2014; Natural England, 2016; Natural England, 2019c). It is terns will habituate to the increased presence of vessels and phases of development.
		Roseate tern	N	This feature no longer breeds in this SPA (Piec, 2018), with Southampton Water during the last five years (last recorded nesting habitat creation is currently being undertaken for this (Lymington-Keyhaven), it is considered that there is no pote the distance between this potential breeding site and the Pro- the species' foraging range (16.6 $\pm$ 11.6 km; Thaxter <i>et al.</i> , 2
		Mediterranean gull	N	Important breeding areas within the SPA include Newtown H River Estuary, and the North Solent (Natural England, 2019) at Eastney. Gull species are consistently scored as being an disturbance from vessel traffic (Garthe & Hüppop, 2004; Bra Mediterranean gulls forage in a variety of habitats where ant England, 2016; Natural England, 2019c). It is therefore cons the increased presence of vessels and associated activities
		Supporting habitat (water column)	N	Disturbance and displacement of prey species present within of development is considered to be negligible since it is likely Solent are accustomed to vessel traffic and the presence of commercial fishing vessels) and will simply navigate round of maintenance vessels.



evelopment phases has the potential to in ingestion or entanglement resulting in

int-Pitts Deep, with less frequently used ewtown Harbour (Natural England, urst Point-Pitts Deep, and the Medina cated >15 km from the Proposed impact during any development phase *et al.*, 2015).

ivity to disturbance from vessel traffic iry *et al.*, 2014). Indeed, common terns levels are already high (Wilson *et al.*, is therefore considered that common nd associated activities during all

itivity to disturbance from vessel traffic rry *et al.*, 2014). Indeed, Sandwich terns levels are already high (Wilson *et al.*, is therefore considered that Sandwich nd associated activities during all

th only a single individual recorded in ed in 2011; Frost *et al.*, 2018). Whilst his species in the Western Solent tential for impact on this feature due to Proposed Development (*c*.30 km) versus , 2012).

Harbour, Hurst Castle to Lymington 9c), all located >20 km from the Landfall amongst the least sensitive species to radbury *et al.*, 2014). Indeed, nthropogenic activities occur (Natural nsidered that this feature will habituate to s during all phases of development.

hin the water column during all phases by that fish species present in the of vessels towing equipment (e.g. or under any construction or

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
	Indirect effects	Little tern	N	Important breeding areas within this SPA include Hurst Point sites including North Solent, Lymington to Pylewell, and New 2019c). Important foraging areas within this SPA include Hur Estuary off the Isle of Wight. Given that these areas are loca Development, it is considered that there is no potential for im foraging range (Parsons <i>et al.</i> , 2015).
		Common tern	Ν	Common terns are visual foragers (Wilson <i>et al.</i> , 2014) and in turbidity which can make it harder to see prey from the sea moderately sensitive to habitat disturbance and subsequent (Bradbury <i>et al.</i> , 2014). However, any impact from suspende development phases is considered to be highly localised rela (Thaxter <i>et al.</i> , 2012; Wilson <i>et al.</i> , 2014), with equivalent for immediate vicinity of the Proposed Development.
		Sandwich tern	Ν	Sandwich terns are visual foragers (Wilson <i>et al.</i> , 2014) and increase in turbidity which can make it harder to see prey fro considered to be moderately sensitive to habitat disturbance prey species (Bradbury <i>et al.</i> , 2014). However, any impact fr across all development phases is considered to be highly loc range (Thaxter <i>et al.</i> , 2012; Wilson <i>et al.</i> , 2014), with equival immediate vicinity of the Proposed Development.
		Roseate tern	Ν	This feature no longer breeds in this SPA (Piec, 2018), with Southampton Water during the last five years (last recorded nesting habitat creation is currently being undertaken for this (Lymington-Keyhaven), it is considered that there is no potential breeding site and the Protothe species' foraging range (16.6 $\pm$ 11.6 km; Thaxter <i>et al.</i> , 2005)
		Mediterranean gull	Ν	Mediterranean gulls are visual foragers and are likely to be a which can make it harder to see prey. Activities associated w Development have the potential to release sediment during s repair and maintenance works. The area covered by suspen limited spatial extent and will return back to baseline concent plasticity shown by Mediterranean gulls in their foraging beha items in both terrestrial and coastal environments; Natural En alternative feeding habitat is available elsewhere in the vicini that there is no potential for impact.
		Supporting habitat (water column)	N	Increases in suspended sediment as a result of seabed prepactivities and cable maintenance are expected to be highly le availability in the water column at Portsmouth Harbour due to



nt-Pitts Deep, with less frequently used wown Harbour (Natural England, urst Point-Pitts Deep, and the Medina cated >15 km from the Proposed impact based on the species' restricted

are likely to be affected by an increase ea surface. They are considered to be t potential effects on prey species ded sediment release across all elative to the species' foraging range oraging habitat elsewhere in the

d are likely to be affected by an rom the sea surface. They are and therefore to potential effects on from suspended sediment release ocalised relative to the species' foraging alent foraging habitat elsewhere in the

n only a single individual recorded in d in 2011; Frost *et al.*, 2018). Whilst is species in the Western Solent ential for impact on this feature due to roposed Development (*c*.30 km) versus 2012).

affected by an increase in turbidity with all phases of the Proposed seabed preparation, cable burial, ended material is considered to be of intrations within days. Given the haviour (taking a wide variety of prey England, 2019c), it is likely that nity of the Proposed Development and

eparation, HDD works, cable burial localised and unlikely to alter prey to distance.

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
	Collision	Little tern	N	Structures or devices which have the potential to pose an ab will not be introduced during any development phase. Surface not considered to be vulnerable to below water collisions (Fu
		Common tern	N	Structures or devices which have the potential to pose an ab terns will not be introduced during any development phase. St terns are not considered to be vulnerable to below water colli
		Sandwich tern	N	Structures or devices which have the potential to pose an ab terns will not be introduced during any development phase. St terns are not considered to be vulnerable to below water colli
		Roseate tern	N	This feature no longer breeds in this SPA (Piec, 2018), with a Southampton Water during the last five years (last recorded or devices which have the potential to pose an above water of be introduced during any development phase. Surface feeding considered to be vulnerable to below water collisions (Furnes
		Mediterranean gull	N	Structures or devices which have the potential to pose an ab Mediterranean gulls will not be introduced during any develop including gulls are not considered to be vulnerable to below w
	INIS	Little tern	N	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to the mainlan the Solent and Southampton Waters SPA due to distance.
		Common tern	N	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to the mainlan within the Solent and Southampton Waters SPA due to dista
		Sandwich tern	N	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to the mainlan within the Solent and Southampton Waters SPA due to dista
		Roseate tern	N	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to newly creat tern breeding colonies within the Solent and Southampton W
		Mediterranean gull	Ν	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to the mainlan colonies within the Solent and Southampton Waters SPA due
		Supporting habitat (water column)	N	Invasive species (e.g. Chinese mitten crabs, slipper limpets a into the water column via biofouling or ballast water from ves habitat structure and those with versatile diets can cause def natives and therefore altering the community structure and for However, given that all three tern species predate on a range



above water collision risk to little terns ace feeding species including terns are Furness *et al.*, 2012).

above water collision risk to common . Surface feeding species including ollisions (Furness *et al.*, 2012).

above water collision risk to Sandwich . Surface feeding species including ollisions (Furness *et al.*, 2012).

n only a single individual recorded in d in 2011; Frost *et al.*, 2018). Structures r collision risk to roseate terns will not ding species including terns are not ess *et al.*, 2012).

above water collision risk to lopment phase. Surface feeding species v water collisions (Furness *et al.*, 2012).

Proposed Development to introduce and little tern breeding colonies within

Proposed Development to introduce and common tern breeding colonies tance.

Proposed Development to introduce and Sandwich tern breeding colonies tance.

Proposed Development to introduce ated and traditional mainland roseate Waters SPA due to distance.

Proposed Development to introduce and Mediterranean gull breeding lue to distance.

s and Pacific oyster) may be introduced essels. Invasive species can affect etrimental impacts by outcompeting food chain (Orlova *et al.*, 2006). ge of prey species including sandeels,

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				herring and sprats which are highly mobile, it is highly unlikel affected by localised changes in prey communities.
	Accidental spills	Little tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect little terns when in contact oiling resulting in mortality.
		Common tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect common terns when in co direct oiling resulting in mortality.
		Sandwich tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect Sandwich terns when in o direct oiling resulting in mortality.
		Roseate tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect roseate terns when in cor direct oiling resulting in mortality.
		Mediterranean gull	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect Mediterranean gulls when through direct oiling resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned oil or chemical spillages from vessels may occur can cause sublethal impacts on juvenile fish growth and surv availability.
	Litter	Little tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect little terns when utilising the sea surface throug in mortality.
		Common tern	Y	Unplanned disposal of industrial or user plastic during all de- directly affect common terns when utilising the sea surface the resulting in mortality.
		Sandwich tern	Y	Unplanned disposal of industrial or user plastic during all de- directly affect Sandwich terns when utilising the sea surface resulting in mortality.
	Roseate tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect roseate terns when utilising the sea surface th resulting in mortality.	
		Mediterranean gull	Y	Unplanned disposal of industrial or user plastic during all de directly affect Mediterranean gulls when utilising the sea surf entanglement resulting in mortality.



ely that any of these species will be

ar during all development phases. Spills act with the sea surface through direct

ur during all development phases. Spills contact with the sea surface through

ar during all development phases. Spills a contact with the sea surface through

ur during all development phases. Spills contact with the sea surface through

ur during all development phases. Spills en in contact with the sea surface

ur during all development phases. Oil urvival, thus potentially affecting prey

evelopment phases has the potential to ugh ingestion or entanglement resulting

evelopment phases has the potential to through ingestion or entanglement

evelopment phases has the potential to e through ingestion or entanglement

evelopment phases has the potential to hrough ingestion or entanglement

evelopment phases has the potential to urface through ingestion or

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Supporting habitat (water column)	Y	Unplanned disposal of industrial or user plastic during all de directly affect prey species within the water column through mortality.
Pagham Harbour SPA/Ramsar site	Disturbance and displacement	Common tern	Ν	Foraging common terns are considered to be of low sensitive and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within Pagham Harbour and the wider S already high (Wilson <i>et al.</i> , 2014; Natural England, 2016; Na considered that common tern will habituate to the increased activities during all phases of development.
		Supporting habitat (water column)	Ν	Disturbance and displacement of prey species present within of development is considered to be negligible since it is likely Solent are accustomed to vessel traffic and the presence of commercial fishing vessels) and will simply navigate round of maintenance vessels.
	Indirect effects	Common tern	Ν	Common terns are visual foragers and are likely to be affected can make it harder to see prey from the sea surface. They a sensitive to habitat disturbance and therefore to potential eff 2014). However, any impact is considered to be highly locali range across all development phases, with equivalent foragin vicinity of the Proposed Development.
		Supporting habitat (water column)	N	Increases in suspended sediment as a result of seabed prep activities and cable maintenance are expected to be highly la availability in the water column at Portsmouth Harbour due to
	Collision	Common tern	N	Structures or devices which have the potential to pose an ab terns will not be introduced during any development phase. terns are not considered to be vulnerable to below water coll
	INIS	Common tern	N	There is no pathway for offshore works associated with the finvasive non-indigenous predators (e.g. mink) to the mainlar Pagham Harbour SPA due to distance.
		Supporting habitat (water column)	Ν	Invasive species (e.g. Chinese mitten crabs, slipper limpets into the water column via biofouling or ballast water from ves habitat structure and those with versatile diets can cause de natives and therefore altering the community structure and for However, given that all three tern species predate on a range herring and sprats which are highly mobile, it is highly unlike affected by localised changes in prey communities.
	Accidental spills	Common tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect common terns when in co direct oiling resulting in mortality.



evelopment phases has the potential to in ingestion or entanglement resulting in

ivity to disturbance from vessel traffic ry *et al.*, 2014). Indeed, common terns r Solent where vessel traffic levels are Natural England, 2019d). It is therefore ad presence of vessels and associated

hin the water column during all phases by that fish species present in the of vessels towing equipment (e.g. or under any construction or

cted by an increase in turbidity which are considered to be moderately effects on prey species (Bradbury *et al.*, alised relative to the species' foraging ging habitat elsewhere in the immediate

eparation, HDD works, cable burial localised and unlikely to alter prey to distance.

above water collision risk to common . Surface feeding species including ollisions (Furness *et al.*, 2012).

Proposed Development to introduce and common tern breeding colony within

s and Pacific oyster) may be introduced essels. Invasive species can affect letrimental impacts by outcompeting food chain (Orlova *et al.,* 2006). ge of prey species including sandeels, ely that any of these species will be

ar during all development phases. Spills contact with the sea surface through

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Supporting habitat (water column)	Y	Unplanned oil or chemical spillages from vessels may occur can cause sublethal impacts on juvenile fish growth and sur availability.
	Litter	Common tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect common terns when utilising the sea surface t resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned disposal of industrial or user plastic during all de directly affect prey species within the water column through mortality.
Littoral Seino-Marin SPA	Disturbance and displacement	Fulmar	N	Given their wide-ranging foraging behaviour (Thaxter <i>et al.</i> , from vessel traffic and associated activities (Garthe & Hüppe the distance between the SPA and the Proposed Developme fulmar.
		Kittiwake	N	Given their wide-ranging foraging behaviour (Thaxter <i>et al.</i> , from vessel traffic and associated activities (Garthe & Hüppe the distance between the SPA and the Proposed Developme kittiwake.
		Herring gull	N	Given their wide-ranging foraging behaviour (Thaxter <i>et al.</i> , from vessel traffic and associated activities (Garthe & Hüppe the distance between the SPA and the Proposed Developm herring gull.
		Great black-backed gull	N	Given their wide-ranging foraging behaviour (Thaxter <i>et al.</i> , from vessel traffic and associated activities (Garthe & Hüppe the distance between the SPA and the Proposed Developme great black-backed gull.
	Indirect effects	Fulmar	N	Given their wide-ranging, pelagic and opportunistic foraging well as their plasticity in diet (e.g. Phillips <i>et al.</i> , 1999), the s effects of sediment release on benthic prey availability is not
		Kittiwake	Ν	Given their wide-ranging, pelagic foraging behaviour (Thaxter low sensitivity to vessel traffic (Garthe & Hüppop, 2004; Bra highly mobile shoaling fish (Natural England, 2012b), the sh effect of sediment release on benthic prey availability is not
		Herring gull	Ν	Herring gulls utilise terrestrial, intertidal and marine habitats prey species including invertebrates, small fish and carrion ( plasticity shown by herring gulls in their foraging behaviour term, temporary and localised effect of sediment release on predicted to impact this feature.



ur during all development phases. Oil urvival, thus potentially affecting prey

development phases has the potential to e through ingestion or entanglement

development phases has the potential to h ingestion or entanglement resulting in

., 2012), low sensitivity to disturbance pop, 2004; Bradbury *et al.*, 2014), and ment, there is no potential for impact on

*I.*, 2012), low sensitivity to disturbance pop, 2004; Bradbury *et al.*, 2014), and ment, there is no potential for impact on

., 2012), low sensitivity to disturbance pop, 2004; Bradbury *et al.*, 2014), and ment, there is no potential for impact on

., 2012), low sensitivity to disturbance pop, 2004; Bradbury *et al.*, 2014), and ment, there is no potential for impact on

ng behaviour (Thaxter *et al.*, 2012), as short-term, temporary and localised not predicted to impact fulmar.

ter *et al*; 2012; Ponchon *et al.*, 2015), radbury *et al.*, 2014), and reliance on short-term, temporary and localised of predicted to impact kittiwake.

ts for foraging, taking a wide variety of n (including fishery discards). Given the r (Natural England, 2019d), the shorton benthic prey availability is not

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Great black-backed gull	N	Given their wide-ranging, pelagic foraging behaviour (Thaxte traffic (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014), and p short-term, temporary and localised effect of sediment release predicted to impact great black-backed gull.
	Collision	Fulmar	N	Structures or devices which have the potential to pose an ab not be introduced during any development phase. Surface fe not considered to be vulnerable to below water collisions (Fu
		Kittiwake	N	Structures or devices which have the potential to pose an ab not be introduced during any development phase. Surface fe not considered to be vulnerable to below water collisions (Fu
		Herring gull	N	Structures or devices which have the potential to pose an ab will not be introduced during any development phase. Surfac not considered to be vulnerable to below water collisions (Fu
		Great black-backed gull	N	Structures or devices which have the potential to pose an ab backed gulls will not be introduced during any development p including gulls are not considered to be vulnerable to below v
	INIS	Fulmar	N	There is no pathway for marine works associated with the Pr invasive non-indigenous predators (e.g. mink) to the mainlan Littoral Seino-Marin SPA due to distance.
		Kittiwake	Ν	There is no pathway for marine works associated with the Pr invasive non-indigenous predators (e.g. mink) to the mainlan Littoral Seino-Marin SPA due to distance.
		Herring gull	Ν	There is no pathway for marine works associated with the Pr invasive non-indigenous predators (e.g. mink) to the mainlan the Littoral Seino-Marin SPA due to distance.
		Great black-backed gull	N	There is no pathway for marine works associated with the P invasive non-indigenous predators (e.g. mink) to the mainlan colony within the Littoral Seino-Marin SPA due to distance.
	Accidental spills	Fulmar	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect fulmars when in contact w oiling resulting in mortality.
		Kittiwake	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect kittiwakes when in contact oiling resulting in mortality.



ter *et al*; 2012), low sensitivity to vessel I plasticity in diet (JNCC, 2016a), the ase on benthic prey availability is not

above water collision risk to fulmars will feeding species including fulmars are Furness *et al.*, 2012).

above water collision risk to kittiwake will feeding species including kittiwakes are Furness *et al.*, 2012).

above water collision risk to herring gulls ace feeding species including gulls are Furness *et al.*, 2012).

above water collision risk to great blackt phase. Surface feeding species v water collisions (Furness *et al.*, 2012).

Proposed Development to introduce and fulmar breeding colony within the

Proposed Development to introduce and kittiwake breeding colony within the

Proposed Development to introduce and herring gull breeding colony within

Proposed Development to introduce and great black-backed gull breeding

r during all development phases. Spills with the sea surface through direct

ar during all development phases. Spills act with the sea surface through direct

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Herring gull	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect herring gulls when in con oiling resulting in mortality.
		Great black-backed gull	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect great black-backed gulls through direct oiling resulting in mortality.
	Litter	Fulmar	Y	Unplanned disposal of industrial or user plastic during all de directly affect fulmars when utilising the sea surface through mortality.
		Kittiwake	Y	Unplanned disposal of industrial or user plastic during all de directly affect kittiwakes when utilising the sea surface throug in mortality.
		Herring gull	Y	Unplanned disposal of industrial or user plastic during all de directly affect herring gulls when utilising the sea surface thr resulting in mortality.
		Great black-backed gull	Y	Unplanned disposal of industrial or user plastic during all de directly affect great black-backed gulls when utilising the sea entanglement resulting in mortality.
Alderney West and Burhou Islands Ramsar site	Disturbance and displacement	Gannet	N	Given their wide-ranging foraging behaviour (Thaxter <i>et al.</i> , Evans <i>et al.</i> , 2016) and low sensitivity to disturbance from ve (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014), there is no
		Storm petrel	N	Given their wide-ranging foraging behaviour (Wernham <i>et a</i> sensitivity to disturbance from vessel traffic and associated a Bradbury <i>et al.</i> , 2014), there is no potential for impact on sto
		Lesser black-backed gull	N	Given their wide-ranging foraging behaviour across terrestria (Thaxter <i>et al.</i> , 2012) and low sensitivity to disturbance from (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014), there is no backed gull.
	Indirect effects	Gannet	Ν	Given their wide-ranging, pelagic foraging behaviour (Thaxte Warwick-Evans <i>et al.</i> , 2016) and reliance on highly mobile s discards (JNCC, 2016b), the short-term, temporary and loca benthic prey availability is not predicted to impact this feature
		Storm petrel	Ν	Storm petrels range widely across marine habitats to forage <i>et al.</i> , 2012), feeding on small fish and zooplankton gleaned known to feed on intertidal crustaceans. Given their plasticity localised effect of sediment release activity on benthic prey this feature.



ur during all development phases. Spills ontact with the sea surface through direct

ur during all development phases. Spills s when in contact with the sea surface

development phases has the potential to the ingestion or entanglement resulting in

development phases has the potential to bugh ingestion or entanglement resulting

development phases has the potential to hrough ingestion or entanglement

development phases has the potential to be surface through ingestion or

*I.*, 2012; Wakefield *et al.*, 2013; Warwickvessel traffic and associated activities no potential for impact on gannet.

*al.*, 2002; Thaxter *et al.*, 2012;) and low d activities (Garthe & Hüppop, 2004; storm petrel.

rial, intertidal and marine environments m vessel traffic and associated activities to potential for impact on lesser black-

ter *et al.*, 2012; Wakefield *et al.*, 2013; schooling fish, squid and fishery calised effect of sediment release on ure

Je during the breeding season (Thaxter ad from the sea surface. Inshore they are city in diet, the short-term, temporary and y availability is not predicted to impact

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Lesser black-backed gull	N	Lesser black-backed gulls utilise terrestrial, intertidal and ma wide variety of prey species including invertebrates, small fis discards). Given the plasticity shown by lesser black-backed (Natural England, 2019d), the short-term, temporary and loca benthic prey availability is not predicted to impact this feature
	Collision	Gannet	Ν	Structures or devices which have the potential to pose an ab not be introduced during any development phase. Whilst divi considered to be vulnerable to below water collisions (Furnes impact is considered to be negligible given the wide-foraging highly localised and temporary area of potential impact from activities.
		Storm petrel	N	Structures or devices which have the potential to pose an ab petrels will not be introduced during any development phase petrels are not considered to be vulnerable to below water co
		Lesser black-backed gull	N	Structures or devices which have the potential to pose an ab black-backed gulls will not be introduced during any develop including gulls are not considered to be vulnerable to below v
	INIS	Gannet	N	There is no pathway for marine works associated with the Prinvasive non-indigenous predators (e.g. mink) to the gannet distance between this site and the Proposed Development.
		Storm petrel	N	There is no pathway for marine works associated with the Pr invasive non-indigenous predators (e.g. mink) to the storm b distance between this site and the Proposed Development.
		Lesser black-backed gull	N	There is no pathway for marine works associated with the Pr invasive non-indigenous predators (e.g. mink) to the lesser b Alderney given the distance between this site and the Propo
	Accidental spills	Gannet	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect gannets when in contact oiling resulting in mortality.
		Storm petrel	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect storm petrels when in con direct oiling resulting in mortality.
		Lesser black-backed gull	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect lesser black-backed gulls through direct oiling resulting in mortality.



harine habitats for foraging, taking a rish and carrion (including fishery ed gulls in their foraging behaviour scalised effect of sediment release on re.

above water collision risk to gannets will iving species such as gannets are ess *et al.*, 2012), the potential for ng range of this species compared to the n cable laying, repair and maintenance

above water collision risk to storm se. Surface feeding species including collisions (Furness *et al.*, 2012).

above water collision risk to lesser pment phase. Surface feeding species water collisions (Furness *et al.*, 2012).

Proposed Development to introduce t breeding colony on Alderney given the

Proposed Development to introduce breeding colony on Alderney given the

Proposed Development to introduce black-backed gull breeding colony on osed Development.

r during all development phases. Spills t with the sea surface through direct

Ir during all development phases. Spills ontact with the sea surface through

ar during all development phases. Spills ls when in contact with the sea surface

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
	Litter	Gannet	Y	Unplanned disposal of industrial or user plastic during all de- directly affect gannets when utilising the sea surface through mortality.
		Storm petrel	Y	Unplanned disposal of industrial or user plastic during all devidence directly affect storm petrels when utilising the sea surface the resulting in mortality.
		Lesser black-backed gull	Y	Unplanned disposal of industrial or user plastic during all de directly affect lesser black-backed gulls when utilising the se entanglement resulting in mortality.



levelopment phases has the potential to gh ingestion or entanglement resulting in

levelopment phases has the potential to through ingestion or entanglement

levelopment phases has the potential to sea surface through ingestion or

WSP/Natural Power



# 7.3. ASSESSMENT OF LSE – ONSHORE ENVIRONMENT

7.3.1.1. An assessment of LSE on designated onshore ecological features during the construction, operation and decommissioning phases of the Proposed Development is provided in Table 7-10.

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
Chichester and Langstone Harbours SPA/Ramsar site	Disturbance and displacement	Little tern	Ν	Foraging little terns are considered to be of moderate sensitivity to disturb 2004; Bradbury <i>et al.</i> , 2014) although their sensitivity to disturbance from terns colonies exist within both Chichester and Langstone Harbours, spe did not locate any breeding individuals or indeed foraging flights (ES Tec are not expected to be exposed disturbance and displacement effects from
		Sandwich tern	Ν	Foraging Sandwich terns are considered to be of low sensitivity to disturb activities (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014), although their activities is uncertain. Indeed, Sandwich terns are known to breed and for Harbours (Wilson <i>et al.</i> , 2014; Natural England, 2016; Natural England, 20 Development did not locate any breeding individuals or indeed foraging for Therefore, Sandwich terns are not expected to be exposed disturbance at the Proposed Development.
		Common tern	Ν	Foraging common terns are considered to be of low sensitivity to disturbativities (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014) although their stactivities is uncertain. Common terns are known to breed and forage with (Wilson <i>et al.</i> , 2014; Natural England, 2016; Natural England, 2019a. Specific did not locate any breeding individuals or indeed foraging flights (ES Tect terns are not expected to be exposed disturbance and displacement effect Development.
		Dark-bellied brent goose Redshank Shelduck	Y	Visual disturbance is considered to be of a limited magnitude as a result an urban setting and recent research has established that disturbance do an estuary close to conurbations (Goss-Custard et al., 2019). Onshore we considered to result in any light spillage in to the SPA. Dark-bellied brent goose, redshank and shelduck are however considered (Cutts et al., 2013). Specific surveys of intertidal habitat adjacent to the o Development recording each of these species in abundance while dark-builtising multiple identified terrestrial strategy sites (ES Technical Appendiand and decommissioning works from onshore elements of the Proposed Development.
			Pintail Shoveler Teal Wigeon Bar-tailed godwit Curlew	Y

# Table 7.10 - Assessment of LSE on designated onshore ecology features across all phases of the Proposed Development



urbance from vessel traffic (Garthe & Hüppop, om onshore activities is uncertain. While little pecific surveys for the Proposed Development echnical Appendix 16.12). Therefore, little terns from any phase of the Proposed Development.

urbance from vessel traffic and associated ir sensitivity to disturbance from onshore forage within both Chichester and Langstone , 2019a. Specific surveys for the Proposed g flights (ES Technical Appendix 16.12). e and displacement effects from any phase of

bance from vessel traffic and associated r sensitivity to disturbance from onshore ithin both Chichester and Langstone Harbours Specific surveys for the Proposed Development echnical Appendix 16.12). Therefore, common fects from any phase of the Proposed

It of the Proposed Development. The SPA is in does not have a significant impact on waders in works from the Proposed Development are not

red highly sensitive to disturbance effects onshore element of the Proposed c-bellied brent geese were also recorded ndix 16.13). Therefore, noise from construction Development could result in disturbance of the

It of the Proposed Development. The SPA is in does not have a significant impact on waders in works from the Proposed Development are not

3); mallard (a dabbling duck with similar oderately sensitive however. It is therefore

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Grey plover		assumed for the purposes of this assessment that these four species of v disturbance effects. Curlew and bar-tailed godwit are also deemed to be al., 2013 – where the findings relating to black-tailed godwit are taken he were recorded in varying numbers in intertidal areas adjacent to the onsh Technical Appendix 16.13). Therefore, noise from construction and deco the Proposed Development could result in disturbance of the feature and
		Turnstone Sanderling Ringed plover Dunlin	Ν	Cutts et al. (2013) determines that turnstone, sanderling, ringed plover an Although all these species were found to be present in intertidal habitat a Development (ES Technical Appendix 16.13) these species are consider disturbance mechanisms from the Proposed Development and are likely
	Supporting habitat	Ν	Disturbance and displacement of prey species during all phases of develops is likely that, for example, fish species present in the Solent are accustom	
	Visual disturbance	Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed plover Bar-tailed godwit Curlew Shelduck Redshank	Ν	Visual disturbance is considered to be of a limited magnitude as a result of an urban setting and recent research has established that disturbance do an estuary close to conurbations (Goss-Custard et al., 2019).
		habitat Sandwich tern		
	Accidental spills	Little tern Common tern Pintail Shoveler	Y	Unplanned oil or chemical spillages from construction activity may occur Spills have the potential to directly affect all SPA features when in contac resulting in mortality.



f wildfowl are moderately sensitive to e moderately sensitive to disturbance (Cutts et here as proxy for bar-tailed). All these species shore works of the Proposed Development (ES commissioning works from onshore elements of nd possible temporary displacement.

and dunlin are of low sensitivity to disturbance. adjacent to onshore works of the Proposed ered to be extremely tolerant of any y to rapidly habituate.

elopment is considered to be negligible since it med to vessel traffic.

It of the Proposed Development. The SPA is in does not have a significant impact on waders in

r during construction and decommissioning. act supporting habitat through direct oiling

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed plover Bar-tailed godwit Curlew Shelduck Redshank		
		Supporting habitat	Y	Unplanned oil or chemical spillages from construction activity may occur Spills have the potential to directly affect supporting habitats and prey sp
	Indirect effects	Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed plover Bar-tailed godwit Curlew Shelduck Redshank	N	Wading bird species are not expected to be affected by any changes in a sediment as a result of HDD works, cable burial activities and cable main and return to within comparable background concentrations within days. affected by an increase in turbidity which can make it harder to see prey be moderately sensitive to habitat disturbance and subsequent potential the distance between the Proposed Development and favoured foraging considered that there is no potential for impact during any development
		Supporting habitat	N	Onshore works are not expected to lead to increases in suspended sedi effects on supporting habitats and prey species are expected.
	INIS	Sandwich tern Little tern Common tern Pintail Wigeon	Ν	There is no pathway for onshore construction work activities associated invasive non-indigenous predators to tern breeding colonies. The risk of affecting other waterbird species and supporting habitat is considered no construction (i.e. HDD).



ur during construction and decommissioning. species resulting in mortality.

n water turbidity. Increases in suspended aintenance is expected to be highly localised s. Terns are visual foragers and are likely to be ey in the water column. They are considered to al effects on prey (Bradbury *et al.*, 2014). Given ng and breeding grounds of terns species, it is t phase.

diment as a result of onshore works, and not

d with the Proposed Development to introduce of other invasive non-indigenous species negligible through the techniques applied to

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Turnstone Dark-bellied brent goose Dunlin Grey plover Shelduck Redshank Supporting habitat		
	Litter	Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed plover Bar-tailed godwit Curlew Shelduck Redshank Supporting habitat	Υ	Unplanned disposal of industrial or user plastic during all development p features and supporting habitat when utilising intertidal habitat through in
Portsmouth Harbour SPA/Ramsar site	Disturbance and displacement	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat	Ν	Visual disturbance is considered to be of a limited magnitude as a result be sufficiently distant from the Proposed Development, the SPA is in an established that Disturbance does not have a significant impact on wade Custard et al., 2019). The SPA is considered to be sufficiently distant fro noise effects or introduction of light will not be result in any exposure of o (Cutts et al., 2013).
	Indirect effects	Dark-bellied brent goose	N	Increases in suspended sediment as a result of HDD works, cable burial to be highly localised and return to within comparable background concer between the Proposed Development and favoured foraging, breeding ar



phases has the potential to directly affect SPA ingestion or entanglement resulting in mortality.

ult of the Proposed Development. In addition to an urban setting and recent research has ders in an estuary close to conurbations (Gossfrom the Proposed Development so that any of qualifying features or supporting habitats

ial activities and cable maintenance is expected acentrations within days. Given the distance and roosting grounds of the SPA, it is

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Dunlin Black-tailed godwit		considered that there is no potential for impact during any development p supporting habitat.
	INIS	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat	Ν	Given the distance between the Proposed Development and favoured for SPA, it is considered that there is no potential for impact during any devel or supporting habitat through the unlikely event of introduction of invasive
	Accidental spills	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat	Ν	Unplanned oil or chemical spillages from onshore works are considered uninvolved from the Proposed Development and the construction techniques
	Litter	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat	Ν	Unplanned disposal of industrial or user plastic during any development p unlikely to impact the SPA due to the distance involved from the Propose techniques employed.



phase on either qualifying features or

oraging, breeding and roosting grounds of the velopment phase on either qualifying features ve non-indigenous species.

d unlikely to impact the SPA due to the distance ues employed.

t phase from onshore works are considered sed Development and the construction

WSP/Natural Power



# 8. IN COMBINATION EFFECTS

# 8.1. OVERVIEW

- 8.1.1.1. PINS Advice Note Ten: Habitats Regulations Assessment (version 8, November 2017) indicates that an appraisal of the effects of any other plans or projects which, in combination with the Proposed Development, that might be likely to have a significant effect on the European site(s) should be undertaken. The scope of this appraisal should be clearly agreed with SNCBs.
- 8.1.1.2. The advice notes that the following projects/plans should be considered;
  - projects that are under construction;
  - permitted application(s) not yet implemented;
  - submitted application(s) not yet determined;
  - all refusals subject to appeal procedures not yet determined;
  - projects on the National Infrastructure's programme of projects24; and
  - projects identified in the relevant development plan (and emerging development plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited and the degree of uncertainty which may be present.
- 8.1.1.3. In the context of the Proposed Development, a three-tiered approach has been used that is considered to encompass the projects/plans listed above;
  - Tier 1: The Proposed Development considered alongside other project/plans currently under construction and/or those consented but not yet implemented, and/or those submitted but not yet determined and/or those currently operational that were not operational when baseline data was collected, and/or those that are operational but have an ongoing effect;
  - Tier 2: Projects/plans on the PINS Programme of Projects where a Scoping Report has been submitted; and
  - Tier 3: Projects/plans on the PINS Programme of Projects where a Scoping Report has not been submitted; (where appropriate) projects identified in the relevant Development Plan (and emerging Development Plans -with appropriate weight being given as they move closer to adoption); and projects identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward (PINS, 2015).



- 8.1.1.4. The projects and plans shown in the tables in Appendix 3 (In Combination Marine Projects, document reference 6.8.3.3) were selected as relevant to the assessment of in combination effects for marine sites and have been sourced from interrogation of the MMO Marine Information System, PINS Programme of Projects, The Crown Estate maps and Geographical Information Systems ('GIS') database and relevant Local Planning Authority ('LPA') planning portals.
- 8.1.1.5. This list was compiled on 31 July 2019 (and subsequently updated in October 2019) and is considered to be sufficient for undertaking an appraisal of the effects of any other marine plans or projects, in combination with the Proposed Development. Figure 8-1 (document reference 6.8.2.8.1) illustrates the locations of all the projects considered and listed in the tables in Appendix 3.
- 8.1.1.6. Distances are approximate and are measured from the closest point of the project or plan as shown on the MMO Marine Information System (where relevant) to the closest point of the Proposed Development.
- 8.1.1.7. Assessments are undertaken using the PINS screening matrices presented in Appendix 1 (document reference 6.8.3.1) which present assessment of likely effects on European site features (both marine and onshore) from the Proposed Development alone (see Section 7) and in combination with other projects.

# 8.2. MARINE ENVIRONMENT

# 8.2.1. ANNEX I HABITATS

8.2.1.1. As there will be no work undertaken within any SAC (recognising the use of HDD under Solent Maritime SAC), the potential for in combination effects is only considered to arise from indirect effects, and of these only increased SSC and sediment deposition are considered to have potential to lead to potentially significant in-combination effects. All other effects are of such limited magnitude that it is considered that no potential for in combination effects exists that could lead to LSE. As all features of the Solent Maritime SAC and South Wight Maritime SAC with connectivity have been screened in due to potential for LSE arising from SSC and deposited sediments from the Proposed Development alone, no in-combination assessment is deemed to be required at LSE stage. In-combination effects will be considered as part of the shadow AA.

# 8.2.2. ANNEX II DIADRAMOUS MIGRATORY FISH

8.2.2.1. The Annex II diadromous migratory fish in combination assessment has been presented in the PINS matrices (see Appendix 1). The contribution of the Proposed Development to potential in combination effects was assessed. The in-combination assessment includes all effects other than those where LSE could not be ruled out (SSC for salmon and sea lamprey of the Itchen and Avon SAC and Pollution events for all sites).



- 8.2.2.2. All other features and sites where it was concluded that no LSE would arise due to the project alone have been assessed against the in-combination projects listed in Table 2: Appendix 3. Plans and projects were removed from the in-combination assessment where they:
  - have a licence end date prior to 2021 therefore no temporary overlap and no potential for LSE;
  - are onshore only therefore no interaction with marine features and no potential for LSE; and
  - are beyond the 12 nmi limit therefore outside the coastal migration pathways and in open sea where alternative habitat is widely available and no potential for LSE.
- 8.2.2.3. In summary, there is considered to be negligible potential for the Proposed Development to contribute to any potential in combination effects on Annex II migratory diadromous fish species. It is considered that any in-combination SSC will not cause a barrier to migration to or from any SAC for which these species are features. In addition, any potential for in-combination noise levels are considered unlikely to produce sound levels at a level to induce audible injury or mortality to any species, and no barriers to key migration routes are predicted as a result of in combination underwater noise. Therefore, no LSE as a result of the contribution of the Proposed Development to any potential in combination effects on the Annex II diadromous migratory fish features of UK or French SACs can be concluded.

# 8.2.3. MARINE MAMMALS

- 8.2.3.1. The list of plans or projects assessed is shown in Table 3 of Appendix 3. Projects or plans with licence end dates prior to 2021 have been excluded from further appraisal since there will be no temporal overlap with the Proposed Development, and therefore no enduring impacts which are considered to have potential to result in in combination effects. This is because the marine mammal baseline will be unaffected by these projects/plans. Purely onshore projects have also been excluded.
- 8.2.3.2. The marine mammal in combination assessment has been presented in the PINS matrices (see Appendix 1). The contribution of the Proposed Development to potential in combination effects was assessed. The in-combination assessment includes all effects other than those where LSE could not be ruled out, i.e. pollution events.
- 8.2.3.3. In summary, there is considered to be negligible potential for the Proposed Development to contribute to any potential in combination effects on either bottlenose dolphin, harbour porpoise, grey seal or harbour seal which are qualifying features of the French SACs considered. This is because there is negligible potential for the sound produced by the Proposed Development to induce the onset of auditory injury (PTS), any disturbance is likely to be temporary and reversible with suitable

alternative local habitat being available in the meantime, the risk of collision with vessels is considered to be negligible, and short term local level changes in prey availability/quality as a result of indirect effects are unlikely to result in a reduction in either fitness or breeding success. Therefore, no LSE as a result of the contribution of the Proposed Development to any potential in combination effects on the marine mammal features of the French SACs can be concluded.

AQUIND

8.2.3.4. Because the potential for connectivity of marine mammals which use the UK SACs and the Proposed Development is considered to be negligible, there is no potential for the Proposed Development to contribute to any potential in combination effects on the marine mammal qualifying features of the UK SACs considered.

# 8.2.4. MARINE ORNITHOLOGY

- 8.2.4.1. The list of plans or projects assessed is shown in Table 4 of Appendix 3. Projects or plans with licence end dates prior to 2021 have been excluded from further appraisal since there will be no temporal overlap with the Proposed Development, and therefore no enduring impacts which are considered to have potential to result in in combination effects.
- 8.2.4.2. The ZOI in which in combination effects on breeding marine ornithological features may occur has been defined according their mean-maximum foraging range (Thaxter *et al.*, 2012). Plans or projects that fall within the mean-maximum foraging range of a particular species from a European site have been included in the list presented in Table 4 in Appendix 3.
- 8.2.4.3. More recent tracking data is available for gannets breeding within the Alderney West Coast and Burhou Islands Ramsar (Warwick-Evans *et al.*, 2016), which has shown that the mean-maximum foraging range for this colony is smaller than that cited by Thaxter *et al.*, (2012) (135 ± 7 km versus 229 ± 124 km). Thus, the use of Thaxter *et al.*, (2012) to define the ZOI for in combination effects is considered to be a conservative approach for this species.
- 8.2.4.4. All species pre-screened into the marine ornithology assessment are breeding features, with the exception of red-breasted merganser. The spatial extent of in combination effects for this non-breeding feature is considered to be encompassed by the ZOI for breeding features, since wintering ranges of inshore waterfowl are generally smaller than the breeding ranges of seabirds (e.g. a mean-maximum of 229 km for breeding gannet, versus the extent of Portsmouth, Langstone and Chichester Harbours for wintering red-breasted merganser). Indeed, the largest aggregations of inshore wintering waterfowl will be found within the boundaries of those marine areas designated for their protection, since many species show relatively high fidelity to wintering sites. For example, resightings of wing-tagged red-breasted mergansers off the north-east of England provided evidence that birds were faithful to wintering sites between years (Wernham *et al.*, 1997).

AQUIND

- 8.2.4.5. For those European sites and features where LSE could not be excluded for the project alone (see Table 9-1, Section 9 for a summary), in combination effects are considered under Stage 2, determination of potential adverse effects on site integrity (Section 10).
- 8.2.4.6. For those European sites and features where no LSE could be concluded for the project alone, no plans or projects identified in the ZOI are considered likely to act in combination with the Proposed Development due to the scale over which project alone effects are predicted to occur (see Appendix 1 PINS matrices for further details).

# 8.3. ONSHORE ENVIRONMENT

- 8.3.1.1. The list of plans/projects to be considered in combination is based on the list applied in Chapter 16 (Onshore Ecology) of the ES. Appendix 16.15 and 16.16 details schemes which could act in-combination with the construction stage to cumulatively affect onshore ecological features.
- 8.3.1.2. For those European sites and features where no LSE could not be concluded for the Proposed Development alone (see Section 6.3 for a summary), in combination effects are considered under Stage 2, determination of potential adverse effects on site integrity (Section 10).
- 8.3.1.3. For those European sites and features where no LSE could be concluded for the Proposed Development alone, no plans or projects identified in the ZoI are considered likely to act in combination with the Proposed Development due to the scale over which project alone effects are predicted to occur (see Appendix 1 PINS matrices for further details).



# 9. SUMMARY OF LIKELY SIGNIFICANT EFFECTS

# 9.1. MARINE ENVIRONMENT

9.1.1.1. Table 9-1 summarises those European sites and features for which LSE could not be excluded, which have been progressed to Stage 2 (Section 10).

# 9.1.2. ANNEX I HABITATS

- 9.1.2.1. Annex I Habitats within the Solent Maritime SAC and South Wight Maritime SAC have been assessed for LSE.
- 9.1.2.2. It was found that LSE could not be excluded for the following Solent Maritime SAC features as a result of increased SSC, deposition of sediments, pollution, and invasive species:
  - Estuaries [1130];
  - Sandbanks which are slightly covered by sea water all the time [1110];
  - Mudflats and sandflats not covered by seawater at low tide [1140];
  - Spartina swards [1320];
  - Atlantic salt meadows [1330]; and
  - Salicornia and other annuals colonising mud and sand [1310].
- 9.1.2.3. LSE could not be excluded for the following South Wight Maritime SAC features as a result of increased SSC, deposition of sediments, pollution, and invasive species:
  - Reefs [1170] and;
  - Submerged or partially submerged sea caves [8330];

# 9.1.3. ANNEX II DIADRAMOUS MIGRATORY FISH

- 9.1.3.1. The designated sites which list Annex II diadromous migratory fish features which fall within the study area (the Channel) for this HRA have been assessed both alone and in combination with other projects.
- 9.1.3.2. It was found that LSE could not be ruled out due to the effects of potential pollution events at all pre-screened in sites. It was also concluded that LSE could not be ruled out for Annex II migratory fish species in the River Itchen SAC and River Avon SAC as a result of increased SSC.



9.1.3.3. No LSE as a result of all other effects was concluded for all sites identified at the prescreening stage (see Section 6.2) either alone or in combination with other plans and projects.

#### 9.1.4. MARINE MAMMALS

- 9.1.4.1. The potential for LSE on the Annex II marine mammal species which are qualifying features of the designated sites which fall within the eastern Channel has been assessed for the Proposed Development both alone and in combination with other plans and projects.
- 9.1.4.2. It was found that LSE could not be ruled out due to the effects of potential pollution events at all sites. No LSE as a result of auditory injury, disturbance, collision or other indirect effects is concluded for all sites identified at the pre-screening stage (see Section 6.2) either alone or in combination with other plans and projects.

#### 9.1.5. MARINE ORNITHOLOGY

9.1.5.1. The designated sites which list Annex I and regularly occurring migratory marine birds which fall within the ZOI have been assessed both alone and in combination with other plans and projects.

European site	Feature	Effect	Project phase/s
Solent and Dorset Coast pSPA	Little tern	Disturbance and displacement	Construction, Operation and De
		Indirect effects	
		Accidental spills	
		Litter	
	Sandwich tern	Indirect effects	
		Accidental spills	
		Litter	
	Common tern	Indirect effects	
		Accidental spills	
		Litter	
	Supporting habitat (water column)	Indirect effects	
		Accidental spills	
		Litter	
Chichester and Langstone	Red-breasted merganser	Disturbance and displacement	Construction, Operation and De
Harbours SPA/Ramsar site		Indirect effects	
		Accidental spills	
		Litter	
	Little tern	Disturbance and displacement	
		Indirect effects	
		Accidental spills	
		Litter	
	Sandwich tern	Indirect effects	
		Accidental spills	
		Litter	
	Common tern	Indirect effects	
		Accidental spills	
		Litter	
	Supporting habitat (water column)	Indirect effects	
		Accidental spills	
		Litter	
Portsmouth Harbour	Red-breasted merganser	Accidental spills	Construction, Operation and De
SPA/Ramsar site		Litter	
	Supporting habitat (water column)	Accidental spills	
		Litter	
Solent and Southampton	Little tern	Accidental spills	Construction, Operation and De
Water SPA/Ramsar site		Litter	

Table 9.1 - European sites and features for which LSE could not be excluded for both the project alone and in combination with other plans and projects



Decommissioning

Decommissioning

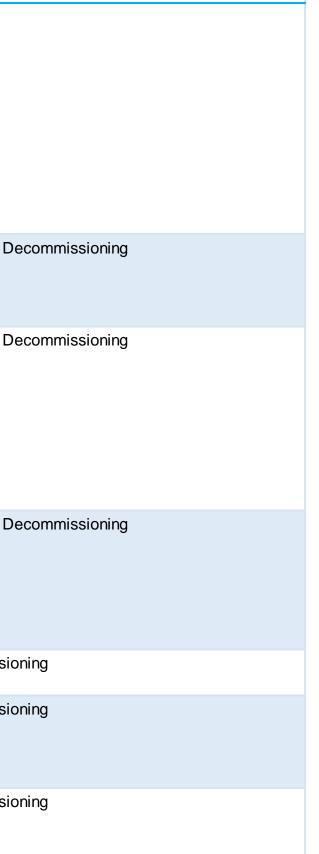
Decommissioning

Decommissioning

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European site	Feature	Effect	Project phase/s
	Common tern	Accidental spills	
		Litter	
	Sandwich tern	Accidental spills	
		Litter	
	Roseate tern	Accidental spills	
		Litter	
	Mediterranean gull	Accidental spills	
		Litter	
	Supporting habitat (water column)	Accidental spills	
		Litter	
Pagham Harbour SPA/Ramsar	Common tern	Accidental spills	Construction, Operation and De
site		Litter	
	Supporting habitat (water column)	Accidental spills	
		Litter	
Littoral-Seino Marin SPA	Fulmar	Accidental spills	Construction, Operation and De
		Litter	
	Kittiwake	Accidental spills	
		Litter	
	Herring gull	Accidental spills	
		Litter	
	Great black-backed gull	Accidental spills	
		Litter	
Alderney West Coast and	Gannet	Accidental spills	Construction, Operation and De
Burhou Islands Ramsar site		Litter	
	Storm petrel	Accidental spills	
		Litter	
	Lesser black-backed gull	Accidental spills	
		Litter	
River Itchen SAC	Salmon	Increased SSC	Construction and Decommissio
		Pollution Events	
River Avon SAC	Salmon	Increased SSC	Construction and Decommissio
		Pollution events	
	Sea lamprey	Increased SSC	
		Pollution Events	
Littoral Cauchois ZSC	Bottlenose Dolphin	Pollution Events	Construction and Decommissio
	Harbour Porpoise	Pollution Events	
	Grey Seal	Pollution Events	





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European site	Feature	Effect	Project phase/s
	Harbour Seal	Pollution Events	
	Twaite shad	Pollution Events	
	Sea lamprey	Pollution Events	
	River lamprey	Pollution Events	
Estuaires et Littoral Picards	Bottlenose Dolphin	Pollution Events	Construction and Decommissioning
(Baies de Somme et d'Authie)	Harbour Porpoise	Pollution Events	
ZSC/Ramsar	Grey Seal	Pollution Events	
	Harbour Seal	Pollution Events	
	River lamprey	Pollution Events	
Baie de Canche et Couloir des	Harbour Porpoise	Pollution Events	Construction and Decommissioning
trois Estuaires ZSC	Grey Seal	Pollution Events	
	Harbour Seal	Pollution Events	
	Allis shad	Pollution Events	
	Sea lamprey	Pollution Events	
	River lamprey	Pollution Events	
	Salmon	Pollution Events	
Baie de Seine Orientale ZSC	Bottlenose Dolphin	Pollution Events	Construction and Decommissioning
	Harbour Porpoise	Pollution Events	
	Grey Seal	Pollution Events	
	Harbour Seal	Pollution Events	
	Allis shad	Pollution Events	
	Twaite shad	Pollution Events	
	Sea lamprey	Pollution Events	
	River lamprey	Pollution Events	
	Salmon	Pollution Events	
River Axe SAC	Sea lamprey	Pollution Events	Construction and Decommissioning
Récifs Gris-Nez Blanc-Nez	Harbour Porpoise	Pollution Events	Construction and Decommissioning
SAC	Grey Seal	Pollution Events	
	Harbour Seal	Pollution Events	
Ridens et dunes hydrauliques	Harbour Porpoise	Pollution Events	Construction and Decommissioning
du détroit du Pas-de-Calais	Grey Seal	Pollution Events	
SAC	Harbour Seal	Pollution Events	
Estuaire de la Seine SAC	Harbour Porpoise	Pollution Events	Construction and Decommissioning
	Grey Seal	Pollution Events	
	Harbour Seal	Pollution Events	
Plymouth Sound and Estuaries SAC	Allis shad	Pollution Events	Construction and Decommissioning



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European site	Feature	Effect	Project phase/s
Solent Maritime SAC	Estuaries [1130]	Increased SSC	Construction, Operation and De
	Sandbanks (slightly covered by seawater all the time) [1110]	Deposition of Sediment (Smothering)	
	Mudflats and sandflats (not submerged at low tide) [1140]	Pollution	
	Spartina swards [1320]		
	Atlantic salt meadows [1330]	Invasive Species	
	Salicornia and other annuals colonising mud and sand [1310]		
South Wight Maritime SAC	Reefs [1170]	Increased SSC	
		Deposition of Sediment (Smothering)	
	Submerged or partially submerged sea caves [8330]	Pollution	
		Invasive Species	



Decommissioning

WSP/Natural Power



# 9.2. ONSHORE ENVIRONMENT

- 9.2.1.1. The potential for LSE on onshore ecology features related to Annex I and regularly occurring migratory birds only. Such features which occur within the ZoI have been assessed in relation to onshore components of the Proposed Development both alone and in combination with other plans and projects.
- 9.2.1.2. Table 9-2 summarises those European sites and features for which no LSE could not be concluded, which have been progressed to Stage 2 (Section 10)

Table 9.2 - European sites and features for which no LSE could not be concluded with respect to onshore activities for both the project a lone and in combination with other plans and projects

European site	Feature	Effect	Project phase/s
Chichester and	Sandwich tern	Accidental spills	Construction and Decommissioning
Langstone Harbours		Litter	Construction and Decommissioning
SPA/Ramsar	Common tern	Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Little tern	Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Dark-bellied brent goose	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Redshank	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Shelduck	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Pintail	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Shoveler	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Teal	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Wigeon	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Bar-tailed godwit	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Curlew	Disturbance and displacement (noise)	Construction and Decommissioning



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European site	Feature	Effect	Project phase/s
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Turnstone	Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Sanderling	Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Grey plover	Disturbance and displacement (noise)	Construction and Decommissioning
		Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Ringed plover	Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Dunlin	Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning
	Supporting habitats	Accidental spills	Construction and Decommissioning
		Litter	Construction and Decommissioning



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# 10. DETERMINATION OF POTENTIAL ADVERSE EFFECTS (ONSHORE MARINE)

# 10.1. OVERVIEW

- 10.1.1.1. Following the initial pre-LSE screening stage (Section 6) and subsequent determination of LSE (Sections 7 and 8), this section determines the potential for the Proposed Development to have an adverse effect on the European sites and features under Stage 2 of the HRA process, both from the project alone and in combination with other plans or projects.
- 10.1.1.2. Table 9-1 and 9-2 in Section 9 summarises those European sites and features for which LSE could not be excluded, which have been progressed to Stage 2.
- 10.1.1.3. The following sections should be read in conjunction with Appendix 1 of this report which presents the PINS integrity matrices.

# 10.2. APPROACH TO ASSESSMENT OF POTENTIAL ADVERSE EFFECTS

# 10.2.1. **OVERVIEW**

- 10.2.1.1. Determining whether, in view of a European site's conservation objectives, the plan or project 'either alone or in combination with other plans or project' would have an adverse effect on site integrity has been assessed in light of:
  - Where available, Natural England's Designated Sites View Supplementary Advice on Conservation Objectives ('SACO');
  - Site-specific information gathered for the environmental baseline;
  - Evidence presented in the ES; and
  - Reasoned argument, professional judgement and lessons learned from other marine cabling projects.
- 10.2.1.2. The following definitions and approach have been used to determine whether the Proposed Development would result in an adverse effect on the integrity of any European site identified as part of this HRA.



# 10.2.2. SITE INTEGRITY

- 10.2.2.1. The assessment of adverse effect on site integrity of a site is addressed in light of the conservation objectives of each site. The integrity of a site is defined as 'the coherence of the site's ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated' (ODPM Circular 06/2005).
- 10.2.2.2. European Commission guidance (2018) on Managing Natura 200 sites emphasises that site integrity involves its ecological structure, function and ecological processes and that the assessment of adverse effect should focus on, and be limited to, the site's conservation objectives.

#### 10.2.3. ADVERSE EFFECT

- 10.2.3.1. The possible impacts of the Proposed Development during the construction, operation and decommissioning phases have been considered in the context of their effect on the qualifying features for the site under consideration.
- 10.2.3.2. An adverse effect on site integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation. In addition, an adverse effect would be one which caused a detectable reduction of the features for which a site was designated, at the scale of the site rather than at the scale of the location of the impact.
- 10.2.3.3. The Habitats Directive defines the conservation status of species as 'favourable' when:
  - Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
  - The natural range of the species is neither being reduced for the foreseeable future; and
  - There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.
- 10.2.3.4. 'Favourable' conservation status of habitats is defined by the Habitats Directive as occurring when:
  - Its natural range and areas it covers within that range are stable or increasing; and
  - The species structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- 10.2.3.5. The EC guidance (2018) also recommends that, when considering the 'integrity of the site', it is important to take account of the possibility that effects can manifest over the short, medium or long-term.



# 10.2.4. SUPPLEMENTARY ADVICE ON CONSERVATION OBJECTIVES

- 10.2.4.1. Natural England's SACO present attributes which are ecological characteristics or requirements of the classified species within a site. The listed attributes are those which best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the conservation objectives. These attributes have a target which is either quantified or qualified depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.
- 10.2.4.2. In many cases, the attribute targets show if the current objective is to either 'maintain' or 'restore' the attribute. The targets given for each attribute do not represent thresholds to assess the significance of any given effect. Instead, these targets are used along with the conservation objectives, and any case-specific advice issued by Natural England when assessing a project that may affect site integrity. Any proposals or operations which may affect the site, or its features should be designed so they do not adversely affect any of the attributes in the SACO or achievement of the conservation objectives.
- 10.2.4.3. Where available, site-specific SACO have been taken into account when considering potential adverse effects on site integrity. For those impacts for which an LSE could not be ruled out, the equivalent attributes and their targets have been screened into the assessment. Further details are provided in each site-based assessment.

#### 10.2.5. ADDITIONAL MITIGATION - MARINE

#### **Disposal of Dredge Material**

- 10.2.5.1. As outlined within Section 3.1.2, the LSE screening stage of the HRA considered a worst-case scenario for increased SSC and sediment deposition resulting from the disposal of dredged material (produced from sandwave clearance) along the entire Marine Cable Corridor. Under this scenario, the spatial extent of the sediment plume was 25 km, which was used as the ZOI for screening and determining LSE.
- 10.2.5.2. Subsequently, mitigation has been included at the AA stage which restricts the disposal of dredged material to take place in the designated disposal site (located between KP 21 and KP 109); thus, prohibiting disposal within the nearshore area (KP 0 KP 21).
- 10.2.5.3. The following worst-case scenario has been used as the basis for assessing the possible adverse effects on site integrity as part of this AA, and the parameters assessed can be summarised as follows:
  - Nearshore (KP0 21)
    - Worst-case activities which will lead to increased SSC are considered to be excavation of HDD pits, and cable installation (due to the potential for the liberation and dispersal of fines identified between KP 5 and 15, and in other isolated locations).



- It is predicted that peak SSCs of up to 200 mg/l may be observed locally (i.e. within 2 km of the cable trench/HDD pit) and these concentrations could potentially persist for several hours following completion of construction activities. Sediment plumes are also likely to be transported up to 5 km away from the trench/pit at which point concentrations of 5 to 10 mg/l are predicted; SSC is expected to return to background levels within a few days following completion of these activities.
- Deposition is not predicted to be significant any coarse material mobilised will deposit rapidly (i.e. within several hundred metres of the cable trench). Finer sediment will be dispersed across a greater spatial extent, transiently depositing throughout the tidal cycle. However, due to the volumes of sediment likely to be liberated into the water column and significant dispersion of fine sediment, it is considered that deposition will be negligible with sediments quickly resuspended and redistributed under the forcing of tidal flows.
- Offshore (Seaward of KP 21)
  - Peak SSC of 1000 mg/l within 1 km from the release point but coarser sediment expected to deposit quickly (almost immediately) with significant reductions of SSC within hours of disposal at each location.
  - Beyond 1 km from release, the passive plume which is transported beyond this is likely to generate SSC in the region of approximately 20 mg/l, transported in the direction of the prevailing flow out to a worst case distance of up to 25 km. SSC is predicted to reduce to background levels (<1 - 6 mg/l) within the timeframe of a few days following completion of these activities.
  - Sediment deposition from disposal activities will be local to the point of release (i.e. within 1000 m), with deposits of coarser sediments potentially observed to depths of between 10 mm and 1.5 m, with greatest deposition observed across an area of a few hundred metres, elongated in the direction of the prevailing flow at the time of release, relative to the release site. Finer sediments will be redistributed and any deposition outside the Marine Cable Corridor will be transient and negligible, with any settled material being quickly redistributed under the forcing of tidal flows.

# **Pollution Prevention**

10.2.5.4. Standard best practice in terms of waste management and spill response procedures for offshore working will be adhered to, as described in the Marine Outline Construction Environmental Management Plan ('CEMP') (Document Reference 6.5)

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submitted with the Application and secured through the Deemed Marine Licence ('dML') which is part of the Draft Development Consent Order (Document Reference 3.1). This will include the following measures that will reduce the likelihood of pollution events to as low as is reasonably practicable.

- Adoption of routine measures and standard best practice in terms of waste management, auditing, pollution prevention measures and implementation of a dropped object protocol will make the likelihood of loss of litter into the environment highly unlikely.
- All vessels will also adhere to MARPOL requirements, managed under the International Safety Management ('ISM') Code, which provides an International standard for the safe management and operation of ships for pollution prevention.
- Oil and fuel shall be stored securely in bunded containers. Chemicals will be stored securely, and good housekeeping practices must be adhered to always.
- The process of refuelling or bunkering shall be managed to ensure that the risk of pollution is minimised with details as to how this will be implemented provided in the method statement for each work phase.
- A Marine Pollution Contingency Plan required as part of the dML (Document Reference 3.1) will be developed for the project post-consent. This plan will set out the measures to be in place to minimise the risks of pollution incidents as well as the procedures to be followed if a pollution incident did occur. This will include the key roles and their responsibilities and relevant contact details.

# **Biosecurity Management**

- 10.2.5.5. A Biosecurity Plan (required under the dML), will be developed for the project postconsent in order to reduce the likelihood of project activities introducing INIS to the local area to as low as is reasonably practicable.
- 10.2.5.6. The management of biosecurity focuses on three areas:
  - Ballast Water Management;
  - Antifouling; and
  - Equipment
- 10.2.5.7. Further information on the outline practices that are proposed are summarised below as described in the Marine Outline CEMP (Document Reference 6.5) submitted with the Application and secured through the dML.
  - Vessels contracted to work on the Proposed Development will be required to follow current UK Guidance on ballast water management;
  - Vessels will also be required to comply with the IMO 1997 guidelines "Guidelines for the Control and Management of Ships' Ballast Water to Minimise the Transfer



of Harmful Aquatic Organisms and Pathogens". In particular, when loading, discharging or exchanging ballast, the vessel will be required to comply with section 9 of the "Guidelines for the control and management of ships' ballast water to minimise the transfer of harmful aquatic organisms and pathogens" (IMO, 1997);

- Vessels contracted to work on the Proposed Development for any purpose will be required to follow current UK Guidance on the use of hull anti-fouling systems; and
- All vessels working on the Proposed Development shall ensure all practical steps are taken to ensure equipment proposed for use on the project is not fouled by marine organisms.

# 10.2.6. SPA CONSERVATION OBJECTIVES

- 10.2.6.1. Conservation objectives apply to the site and the individual features and/or assemblages of features for which the site has been designated.
- 10.2.6.2. For those European sites where LSE could not be excluded, the conservation objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Birds Directive, by maintaining or restoring:
  - The extent and distribution of the habitats of the qualifying features;
  - The structure and function of the habitats of the qualifying features;
  - The supporting processes on which the habitats of the qualifying features rely;
  - The populations of qualifying features; and
  - The distribution of qualifying features within the site.
- 10.2.6.3. Given that the populations and distribution of qualifying features are reliant on the extent, distribution, structure, function and processes of supporting habitat, assessment of indirect effects on the latter two conservation objectives is considered to encapsulate assessment of the conservation objectives related to supporting habitat, through consideration of SACO attributes relating to supporting habitat. As such, only the latter two conservation objectives relating to qualifying features have been taken forward for assessment.
- 10.2.6.4. Natural England in their advice on the draft HRA Report (dated 20 September 2019, see Appendix 4), confirmed they were content this approach as the Conservation Objectives relating to supporting habitats are encapsulated within the assessment of 'indirect effects' upon the qualifying features.



# 10.2.7. SAC CONSERVATION OBJECTIVES

- 10.2.7.1. Conservation objectives apply to the site and the individual features and/or assemblages of features for which the site has been designated.
- 10.2.7.2. For those European sites in the UK where LSE could not be excluded, the conservation objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Habitats Directive, by maintaining or restoring:
  - The extent and distribution of qualifying natural habitats and habitats of the qualifying species;
  - The structure and function (including typical species) of qualifying natural habitats;
  - The structure and function of the habitats of the qualifying species;
  - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
  - The populations of each of the qualifying species; and
  - The distribution of qualifying species within the site.
- 10.2.7.3. For the sites where LSE could not be ruled out, an assessment of relevant conservation objectives (including consideration of sites specific targets) has been undertaken.

# 10.3. SOLENT AND DORSET COAST PSPA

# 10.3.1. **OVERVIEW**

- 10.3.1.1. Solent and Dorset Coast pSPA is located on the south coast within the English Channel. The site is approximately 255.2 nautical miles squared ('nmi<sup>2</sup>') and extends from the Isle of Purbeck in the west to Bognor Regis in the east, following the coastline on either side to the Isle of Wight and into Southampton Water. The pSPA is proposed to protect important at-sea foraging areas used by qualifying interest features from colonies within adjacent, already classified SPAs. These qualifying interest features are three species of tern: common tern, Sandwich tern and little tern and the site boundary was established as a composite of the usage of the area within adjacent SPAs.
- 10.3.1.2. From west to east, the adjacent SPAs with these tern species as qualifying interest features (in parentheses) are: Poole Harbour (common tern) Solent and Southampton Water SPA (common, Sandwich and little tern) and Chichester & Langstone Harbours SPA (common, Sandwich and little tern). In addition to these species at these sites, Sandwich terns at the Poole Harbour SPA have been included in determining the details of the pSPA. However, certain species at certain sites i.e. roseate tern at Solent and Southampton Water SPA, and Sandwich, little and common tern at Pagham Harbour SPA, have not been included in determining the

details of the pSPA. These exclusions have been made on the basis of these birds either not being a qualifying feature at the source SPAs and/or being present in such low numbers either at classification or recently (or both) to merit influencing the size and shape of the pSPA.

# 10.3.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

- 10.3.2.1. Site-specific SACO is not currently available for the Solent and Dorset Coast pSPA. As such, SACO available for the Chichester and Langstone Harbours SPA<sup>38</sup>, which is adjacent to the pSPA, has been used as a basis for the assessment.
- 10.3.2.2. Table 10-1 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Little tern	Disturbance and displacement	Disturbance caused by human activity
Little tern Sandwich tern	Indirect effects	Supporting habitat: food availability
Common tern		Supporting habitat: water quality - turbidity
	Accidental spills and Litter	Supporting habitat: water quality - contaminants
Supporting habitat (water column)	Indirect effects	Supporting habitat: water quality - dissolved oxygen ('DO')
		Supporting habitat: water quality - turbidity
	Accidental spills and Litter	Supporting habitat: water quality - contaminants

# Table 10.1 - SACO attributes screened in for assessment

10.3.2.3. Non-equivalent attributes listed within the SACO which were screened out from further assessment included:



<sup>&</sup>lt;sup>38</sup><u>https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9011011&SiteName=C</u> <u>hichester+and+Langstone&SiteNameDisplay=Chichester+and+Langstone+Harbours+SPA&countyCode=&res</u> <u>ponsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=18</u> (Accessed October 2019)



- Breeding population: abundance;
- Connectivity with supporting habitats;
- Predation all habitats;
- Supporting habitat: air quality;
- Supporting habitat: conservation measures;
- Supporting habitat: extent and distribution of supporting habitat for the breeding season;
- Supporting habitat: landform;
- Supporting habitat: vegetation characteristics for nesting; and
- Supporting habitat: water quality nutrients.
- 10.3.2.4. Natural England in their advice on the draft HRA Report (dated 20 September 2019, see Appendix 4), confirmed that they were content with this approach i.e. only considering attributes in detail where they are relevant to the feature-activity-pressure interactions screened in at LSE stage.

# 10.3.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.3.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-2 below.
- 10.3.3.2. It is concluded that there will be no adverse effects on site integrity for the Solent and Dorset Coast pSPA, either from the Proposed Development alone, or in combination with other plans or projects

# Table 10.2 - Assessment of potential adverse effects on site integrity for the Solent and Dorset Coast pSPA across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Little tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, nesting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Little terns at sea are sensitivity to disturban (Garthe & Hüppop, 20) Within Langstone and colonies of little tern a known to forage in rel breeding colonies, one Langstone Harbour (s Proposed Developme HDD3) have potential foraging given its mod Of the three onshore Wharf is the closest lo located at a minimum Island colony. Sheet p and displace foraging events. However, these works industrialised setting. duration (two hours for noise levels from the Baker's Island, given the distance is double associated with constit therefore unlikely to b disturbance within Lai Cutts <i>et al.</i> , 2009). Wi terns be temporarily of the onshore HDD wor equivalent foraging si Chichester and Langs unaffected by the Pro and HDD2 are located colonies, it is consider from onshore HDD wor are located above MH Outside of Langstone shallow, nearshore wa Harbour. There is the disturbed and therefor noise events and visu



e scored as being of moderate ance and therefore displacement 2004; Bradbury et al., 2014). nd Chichester Harbours, breeding are present. Given that little terns are elatively close proximity to their onshore HDD works within the (see Chapter 3 Description of the nent for locations of HDD1, HDD2 and al to displace this species during oderate sensitivity to disturbance at sea. HDD locations, HDD3 at Kendall's location to a little tern breeding colony. m distance of c.2 km from the Baker's piling at HDD3 may therefore disturb g birds through unpredictable noise

ks will be above MHWS in an already . Vibro-hammering will be very short in for installation at each location) and EMV at HDD3 will be c.40 dB at n that SPLs reduce by 6 dB each time led. Noise and visual disturbance struction activities at HDD3 are be noticeable above baseline levels of angstone Harbour (Cutts & Allen, 1999; Vhilst considered unlikely, should little disturbed from foraging in proximity to orks within Langstone Harbour, other sites are present elsewhere in stone Harbours which will be roposed Development. Given that HDD1 ed further away from little tern breeding ered that there is no potential for impact works at these locations, both of which 1HWS in an urban environment. e Harbour, little terns may be present in

waters at the mouth of Langstone erefore potential for foraging birds to be ore displaced by both unpredictable sual disturbance associated with

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					construction activities Eastney. Vibro-hammering at the in duration and noise of pipe-driving machine w SPLs are unlikely to be this urban setting. Sind maximum of 1 m whils considered that expose from the vibro-hammer minimal and not discer noise levels (median n 81.5 to 95.5 dB re 1 µR A single jack-up vesse vessel, a crew transfer may be present at the weeks, with a total of 6 this period. The potent low tide between KP 1 duration of up to 4 wee above baseline levels levels of traffic within the Given that the foraging nearshore waters up the Parsons <i>et al.</i> , 2015), activities beyond this r However, it is anticipative vessel movements over stage throughout the M the marine HDD location period. Construction vessels as that have difficulty in m passage distance of up number of vessels pre- it is likely that each ves area of the rolling safe durations (hours to day in the Channel and So terns which use the Ma expected to be habitua During operation, it is a case failure rate of the repair every 10-12 year



# es at the marine HDD location off

the marine HDD location will be short e generated by the vibro-hammers and e will be non-percussive and airbourne be noticeable above the baseline in ince little terns plunge dive to a ilst feeding (RPS, 2011), it is osure to any underwater noise resulting her and pipe driving machine will be cernable above background underwater n noise levels around the UK range from  $\mu$ Pa; Merchant *et al.*, 2016).

sel, together with a multicat, a safety fer vessel and up to four workboats he marine HDD location for up to 44 of 636 vessel movements predicted over ential grounding of cable lay barges at P 1.0 and KP 4.7 will occur over a short veeks. This is unlikely to be noticeable ls of disturbance from the existing high in the area.

ing range of little terns is restricted to b to c.10 km (Thaxter *et al.*, 2012; b), it is unlikely that construction is range will impact this feature. bated that there may be up to c.825 over the course of the construction be Marine Cable Corridor, including at ation, over the 30-month construction

s such as the larger CLVs and barges in manoeuvring will have a rolling safe if up to 700 m. Whilst there may be a present during each stage of installation, vessel will only be present in any one afe passage distance zone for very short days). Furthermore, vessel traffic levels Solent are already high. As such, little Marine Cable Corridor to forage are tuated to such levels of disturbance. is assumed that an indicative worsthe Marine Cables would require one rears. If required, it is likely that repairs

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					would be undertaken timeframe (weeks to disturbance and disp operation and mainte construction. Therefore, potential of Proposed Developme effect on the integrity this SPA. Potential effects resu temporal and spatial Development (Table highly localised and t that there is no poten either alone or in con (see Appendix 1 PINS
		Indirect effects	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. crustacea, annelids, sandeel, herring, clupeidae) at preferred sizes.	Little terns are effective shellfish populations a moderate sensitivity to Hüppop, 2004; Bradb (and therefore the pre- may be temporarily do resulting in effective how visual foragers and a in turbidity which can sea surface. Activities the potential to release during cable installation Within Langstone Half numbers may be high points of the drill are no pathway for the works suspended sediment the works are not pre- species in Langstone HDD pits (KP 1.0-1.6) potential for the liberate between KP 5 and 155 transport the finest set point. However, it is ho distances will be low discernible above nate approximately <5 to 7



n by a single vessel, over a short o months). Thus, the potential for placement effects on little tern during enance would be less than during

disturbance and displacement from the nent alone will not result in an adverse y of little tern as a qualifying feature of

ulting from plans or projects which have I overlap with the Proposed

e 4 of Appendix 3) are considered to be temporary. As such, it is considered initial for adverse effects on site integrity imbination with other project and plans NS matrices for further details).

tively top predators of benthos, fish and a and are considered likely to be of to habitat disturbance (Garthe & Ibury *et al.*, 2014). If seabed habitats rey species) are disturbed, the area devoid of any potential food sources, habitat loss. Furthermore, terns are are likely to be affected by an increase n make it harder to see prey from the es associated with construction have ase sediment into the water column tion and associated works.

arbour where foraging little terns gh, HDD will be used. The entry/exit e expected to be onshore, thus there is works to result in an increase in nt or resultant smothering. Therefore, redicted to significantly affect tern prey e Harbour.

e Harbour, excavation at the marine 6), and cable installation (due to the ration and dispersal of fines identified 15, and in other isolated locations) will sediments up to 10 km from the release highly likely that SSC at these v (< 5 mg/l) and therefore not atural variation, which ranges from 75 mg/l in coastal areas. Effects on

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					prey species at the Labe significant since be in SSC will be tempor extent. Elsewhere within the little tern densities are <i>al.</i> , 2015), the area of is anticipated to be a Marine Cable Corrido expected to be preser maximum foraging rat 2012). Within this nea predicted that a peak observed locally (i.e. v pit) and these concern several hours followin Sediment plumes are km from the cable tree concentrations of 5 to expected to return to following completion of are able to tolerate a a to frequent exposure to sediment concentration levels of suspended s <i>et al.</i> , 2017). During operation, with considered that there onshore nature of the Outside of Langstone permanent loss of fish result of cable non-bu significantly affect pre- will be limited in spatial Given that an indicativ Marine Cables would it is considered that po- less than predicted du significant. As such, the potential availability resulting fr turbidity from the Prop predicted to result in a integrity.



Landfall are therefore not considered to both habitat disturbance and increases brary, short in duration and small in

Marine Cable Corridor, where foraging re likely to be much lower (Parsons et of disturbed habitat for route preparation a maximum of 3.6 km<sup>2</sup> along the entire lor (c.6%). Breeding little tern are not ent beyond KP 21 given their meanange (6.3 km  $\pm$  2.4 km; Thaxter *et al.*, earshore area (KP 0 - 21), it is k SSC of up to 200 mg/l may be within 2 km of the cable trench/HDD entrations could potentially persist for ing completion of construction activities. e also likely to be transported up to 5 ench/HDD pit at which point to 10 mg/l are predicted; SSC is b background levels within a few days of these activities. Most prev species a degree of suspended sediment owing to storm induced fluctuations in ions, together with high background sediment in the Solent already (Guillou

thin Langstone Harbour, it is e is no pathway for impact due to the le cable crossing.

e Harbour during operation, the sh, shellfish and benthic habitat as a burial protection is not predicted to rey availability since these measures tial extent ( $c.0.67 \text{ km}^2$ ).

tive worst-case failure rate of the d require one repair every 10-12 years, potential increases in SSC would be during construction and therefore not

al for impact from reduced prey from seabed disturbance and increased oposed Development alone is not a significant adverse effect on site

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Potential effects result temporal and spatial of Development (Table 4 highly localised and te that there is no potent either alone or in com (see Appendix 1 PINS
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Little terns are visual to by an increase in turb prey. They are consident habitat disturbance (E associated with constant have the potential to re- column during cable in HDD pit excavation. However, since HDD Harbour, with an onstant suspended material is Outside of Langstone HDD pits (KP 1.0-1.6) potential for the liberat between KP 5 and 15 transport the finest set point. However, it is he distances will be low ( discernible above nate approximately <5 to 7 Elsewhere within the little tern densities are <i>al.</i> , 2015), the area of is anticipated to be a Marine Cable Corrido expected to be present maximum foraging rate 2012). Within this neat predicted that a peak observed locally (i.e., pit) and these concent several hours followin Sediment plumes are km from the cable tree concentrations of 5 to expected to return to following completion of



ulting from plans or projects which have I overlap with the Proposed 4 of Appendix 3) are considered to be temporary. As such, it is considered ntial for adverse effects on site integrity

mbination with other project and plans IS matrices for further details).

I foragers and are likely to be affected bidity which can make it harder to see idered to be moderately sensitive to (Bradbury *et al.*, 2014). Activities struction, repair and maintenance works o release sediment into the water e installation and associated works e.g.

D will be used within Langstone shore exit point, the volume of is considered to be negligible.

e Harbour, excavation at the marine 6), and cable installation (due to the ration and dispersal of fines identified 5, and in other isolated locations) will sediments up to 10 km from the release highly likely that SSC at these  $\gamma$  (< 5 mg/l) and therefore not atural variation, which ranges from 75 mg/l in coastal areas.

Marine Cable Corridor, where foraging re likely to be much lower (Parsons et of disturbed habitat for route preparation a maximum of 3.6 km<sup>2</sup> along the entire lor (c.6%). Breeding little tern are not ent beyond KP 21, given their meanange (6.3 km  $\pm$  2.4 km; Thaxter *et al.*, earshore area (KP 0 - 21), it is k SSC of up to 200 mg/l may be within 2 km of the cable trench/HDD entrations could potentially persist for ing completion of construction activities. e also likely to be transported up to 5 ench/HDD pit at which point to 10 mg/l are predicted; SSC is b background levels within a few days of these activities.

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Most prey species are suspended sediment induced fluctuations in with high background Solent already (Guillou During operation, an in Marine Cables would it is considered that po- less than predicted du significant. As such, the potential availability resulting fr Proposed Development significant adverse eff Potential effects result temporal and spatial of Development (Table 4 highly localised and te As such, it is consider adverse effects on site species within the wat either alone or in com (see Appendix 1 PINS
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chen during all developmen directly affect little terr direct oiling resulting i Unplanned disposal of development phases tern mortality through However, routine mitig practice in terms of wa prevention measures make the likelihood of and therefore it is prev mitigation measures, integrity for the project Given the scale and m projects and the requi practice measures wh effects, it is predicted site integrity in combin (see Appendix 1 PINS



re able to tolerate a degree of at owing to frequent exposure to storm in sediment concentrations, together d levels of suspended sediment in the lou *et al.*, 2017).

n indicative worst-case failure rate of the d require one repair every 10-12 years, potential increases in SSC would be during construction and therefore not

al for impacts from reduced prey from increased turbidity from the nent alone is not predicted to result in a effect on site integrity.

ulting from plans or projects which have I overlap with the Proposed

e 4 of Appendix 3) are considered to be temporary.

ered that there is no potential for site integrity from effects on prey rater column from increased turbidity, mbination with other project and plans IS matrices for further details).

emical spillages from vessels may occur ent phases. Spills have the potential to erns utilising the sea surface through i in mortality.

of industrial or user plastic during all s also has the potential to cause little h ingestion or entanglement.

tigation measures of standard best waste management, pollution s and strict navigational protocols will

of these events occurring highly unlikely edicted that, in consideration of

, there will be no adverse effects on site ect alone.

nature of other potential plans and uirement to adhere to similar best which could contribute to in combination of that there will be no adverse effect on bination with other plans and projects NS matrices for further details).

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Sandwich tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Indirect effects	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. crustacea, annelids, sandeel, herring, clupeidae) at preferred sizes.	Sandwich terns are et and shellfish population moderate sensitivity to Hüppop, 2004; Bradb (and therefore the pre- may be temporarily du- resulting in effective h- visual foragers and an in turbidity which can sea surface. Activities the potential to releas during cable burial an Within Langstone Har points of the drill are et no pathway for the wo suspended sediment the works are not pre- species in Langstone HDD pits (KP 1.0-1.6) potential for the liberat between KP 5 and 15 transport the finest set point. However, it is h distances will be low et discernible above nate approximately <5 to 7 prey species at the La be significant since be in SSC will be tempor extent. Elsewhere within the Sandwich tern densiti the area of disturbed anticipated to be a ma Marine Cable Corrido usage distributions pr densities of breeding beyond KP 21. Within is predicted that a pea observed locally (i.e. pit) and these concern several hours followin Sediment plumes are



effectively top predators of benthos, fish tions and are considered likely to be of to habitat disturbance (Garthe & Ibury *et al.*, 2014). If seabed habitats rey species) are disturbed, the area devoid of any potential food sources, habitat loss. Furthermore, terns are are likely to be affected by an increase n make it harder to see prey from the es associated with construction have ase sediment into the water column and associated works.

arbour, HDD will be used. The entry/exit e expected to be onshore, thus there is works to result in an increase in nt or resultant smothering. Therefore, redicted to significantly affect tern prey e Harbour.

e Harbour, excavation at the marine 6), and cable installation (due to the ration and dispersal of fines identified 15, and in other isolated locations) will sediments up to 10 km from the release highly likely that SSC at these v (< 5 mg/l) and therefore not atural variation, which ranges from 75 mg/l in coastal areas. Effects on Landfall are therefore not considered to both habitat disturbance and increases orary, short in duration and small in

e Marine Cable Corridor, where foraging ities may be lower (Wilson *et al.*, 2014), d habitat for route preparation is naximum of 3.6 km<sup>2</sup> along the entire for (*c*.6%). Based on the predicted presented in Wilson *et al.*, (2014), high g Sandwich terns are not expected in the area of highest use (KP 0-21), it eak SSC of up to 200 mg/l may be . within 2 km of the cable trench/HDD entrations could potentially persist for ing completion of construction activities. re also likely to be transported up to 5

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					km from the cable tree concentrations of 5 to expected to return to following completion Most prey species ar suspended sediment induced fluctuations with high background Solent already (Guillo During operation, wit considered that there onshore nature of the Outside of Langstone permanent loss of fis result of cable non-bu significantly affect pre will be limited in spat Given that an indicat Marine Cables would it is considered that p less than predicted d significant. As such, prey availability resul increased turbidity fro not predicted to be si that it will not result in Potential effects result temporal and spatial Development (Table highly localised and to that there is no poter from in combination of Appendix 1 PINS mate
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Sandwich terns are w affected by an increat harder to see prey. T sensitive to habitat d Activities associated maintenance works h into the water column associated works e.g



rench/HDD pit at which point to 10 mg/l are predicted; SSC is to background levels within a few days n of these activities.

are able to tolerate a degree of nt owing to frequent exposure to storm in sediment concentrations, together nd levels of suspended sediment in the llou *et al.*, 2017).

vithin Langstone Harbour, it is re is no pathway for impact due to the he cable crossing.

ne Harbour during operation, the fish, shellfish and benthic habitat as a burial protection is not predicted to prey availability since these measures atial extent (c.0.67 km<sup>2</sup>).

ative worst-case failure rate of the ald require one repair every 10-12 years, t potential increases in SSC would be during construction and therefore not a, the potential for effects from reduced sulting from seabed disturbance and from the Proposed Development alone is significant and therefore, it is considered t in any adverse effects on site integrity. sulting from plans or projects which have al overlap with the Proposed e 4 of Appendix 3) are considered to be d temporary. As such, it is considered ential for adverse effects on site integrity n effects on prey availability (see

natrices for further details).

visual foragers and are likely to be ease in turbidity which can make it They are considered to be moderately disturbance (Bradbury *et al.*, 2014). d with construction, repair and have the potential to release sediment nn during cable installation and e.g. HDD pit excavation.

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					However, since HDD Harbour, with an ons suspended material i Outside of Langstone HDD pits (KP 1.0-1.6 potential for the liber between KP 5 and 18 transport the finest so point. However, it is h
					distances will be low discernible above na approximately <5 to
					Elsewhere within the Sandwich tern densit <i>et al.</i> , 2014), the area preparation is anticip along the entire Mari
					the predicted usage (2014), high densities expected beyond KP 0-21), it is predicted to
					be observed locally ( trench/HDD pit) and persist for several ho construction activities be transported up to
					which point concentra SSC is expected to r days following compl
					Most prey species an suspended sediment induced fluctuations with high background Solent already (Guillo
					During operation, an Marine Cables would it is considered that p less than predicted d significant.
					As such, the potentia a result of the Propos predicted to be signif that it will not result in



D will be used within Langstone shore exit point, the volume of l is considered to be negligible.

e Harbour, excavation at the marine 6), and cable installation (due to the ration and dispersal of fines identified 15, and in other isolated locations) will sediments up to 10 km from the release highly likely that SSC at these v (< 5 mg/l) and therefore not atural variation, which ranges from 75 mg/l in coastal areas.

e Marine Cable Corridor, where foraging ities are likely to be much lower (Wilson a of disturbed habitat for route pated to be a maximum of 3.6 km<sup>2</sup> rine Cable Corridor (c.6%). Based on distributions presented in Wilson et al., es of breeding Sandwich terns are not P 21. Within the area of highest use (KP that a peak SSC of up to 200 mg/l may (i.e. within 2 km of the cable these concentrations could potentially ours following completion of es. Sediment plumes are also likely to 5 km from the cable trench/HDD pit at rations of 5 to 10 mg/l are predicted; return to background levels within a few

pletion of these activities.

The able to tolerate a degree of the owing to frequent exposure to storm in sediment concentrations, together ad levels of suspended sediment in the lou *et al.*, 2017).

n indicative worst-case failure rate of the d require one repair every 10-12 years, potential increases in SSC would be during construction and therefore not

al for effects from increased turbidity as osed Development alone is not ificant and therefore, it is considered in any adverse effects on site integrity.

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Potential effects result temporal and spatial Development (Table highly localised and t As such, it is conclud adverse effects on si on prey species withi PINS matrices for fur
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or cher during all developmen directly affect Sandwit through direct oiling r disposal of industrial phases also has the mortality through inge However, routine miti practice in terms of w prevention measures make the likelihood of and therefore it is pre- mitigation measures, integrity from the Pro- Given the scale and n projects and the requi practice measures wi effects, it is predicted site integrity in combi
Common tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Indirect effects	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. crustacea, annelids, sandeel, herring, clupeidae) at preferred sizes.	Common terns are ef and shellfish populati moderate sensitivity to Hüppop, 2004; Bradb (and therefore the pro- may be temporarily do resulting in effective I visual foragers and a in turbidity which can sea surface. Activities the potential to release during cable installati Within Langstone Ha points of the drill are no pathway for the we suspended sediment



sulting from plans or projects which have al overlap with the Proposed

e 4 of Appendix 3) are considered to be I temporary.

Ided that there is no potential for site integrity from in combination effects hin the water column (see Appendix 1 urther details).

emical spillages from vessels may occur ent phases. Spills have the potential to wich terns utilising the sea surface g resulting in mortality. Unplanned al or user plastic during all development e potential to cause Sandwich tern gestion or entanglement.

nitigation measures of standard best waste management, pollution es and strict navigational protocols will of these events occurring highly unlikely predicted that, in consideration of s, there will be no adverse effects on site roposed Project alone.

d nature of other potential plans and quirement to adhere to similar best which could contribute to in combination ed that there will be no adverse effect on bination with other plans and projects.

effectively top predators of benthos, fish ations and are considered likely to be of / to habitat disturbance (Garthe & dbury *et al.*, 2014). If seabed habitats prey species) are disturbed, the area devoid of any potential food sources, e habitat loss. Furthermore, terns are are likely to be affected by an increase an make it harder to see prey from the ies associated with construction have ase sediment into the water column ation and associated works.

larbour, HDD will be used. The entry/exit e expected to be onshore, thus there is works to result in an increase in nt or resultant smothering. Therefore,

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					the works are not pre- species in Langstone Outside of Langstone HDD pits (KP 1.0-1.6) potential for the liberat between KP 5 and 15 transport the finest set point. However, it is h distances will be low ( discernible above naturation approximately <5 to 7 prey species at the Lat be significant since be in SSC will be tempor extent. Elsewhere within the common tern densitie the area of disturbed anticipated to be a mark Marine Cable Corrido not expected to be pre- given their mean-mark km; Thaxter <i>et al.</i> , 20 – 21), it is predicted th be observed locally (i. trench/HDD pit) and th persist for several hou construction activities be transported up to 5 which point concentration SSC is expected to re- days following complet Most prey species are suspended sediment induced fluctuations in with high background Solent already (Guillow During operation, with considered that there onshore nature of the Outside of Langstone



edicted to significantly affect tern prey e Harbour.

he Harbour, excavation at the marine 6), and cable installation (due to the ration and dispersal of fines identified 15, and in other isolated locations) will sediments up to 10 km from the release highly likely that SSC at these v (< 5 mg/l) and therefore not atural variation, which ranges from 75 mg/l in coastal areas. Effects on Landfall are therefore not considered to both habitat disturbance and increases orary, short in duration and small in

e Marine Cable Corridor, where foraging ies may be lower (Wilson et al., 2014), d habitat for route preparation is naximum of 3.6 km<sup>2</sup> along the entire lor (c.6%). Breeding common tern are present beyond KP 21 in high densities, aximum foraging range (15.2 km ± 11.2 012). Within this nearshore area (KP 0 that a peak SSC of up to 200 mg/l may (i.e. within 2 km of the cable these concentrations could potentially ours following completion of es. Sediment plumes are also likely to 5 km from the cable trench/HDD pit at rations of 5 to 10 mg/l are predicted; return to background levels within a few pletion of these activities.

re able to tolerate a degree of at owing to frequent exposure to storm in sediment concentrations, together d levels of suspended sediment in the lou *et al.*, 2017).

ithin Langstone Harbour, it is is no pathway for impact due to the ne cable crossing.

e Harbour during operation, the sh, shellfish and benthic habitat as a purial protection is not predicted to

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute	Target	significantly affect pre will be limited in spat Given that an indicate Marine Cables would it is considered that p less than predicted d significant. As such, the potentia availability resulting f turbidity from the Pro
					predicted to be signif that it will not result in Potential effects result temporal and spatial Development (Table highly localised and t As such, it is conside adverse effects on sin plans and projects or PINS matrices for fur
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Common terns are vi affected by an increa harder to see prey. T sensitive to habitat di Activities associated maintenance works h into the water column associated works e.g However, since HDD Harbour, with an ons suspended material i Outside of Langstone HDD pits (KP 1.0-1.6 potential for the libera between KP 5 and 18 transport the finest se point. However, it is h distances will be low discernible above nat approximately <5 to 7 Elsewhere within the common tern densitie <i>et al.</i> , 2014), the area



brey availability since these measures atial extent (c.0.67 km<sup>2</sup>).

ative worst-case failure rate of the Id require one repair every 10-12 years, potential increases in SSC would be during construction and therefore not

ial for effects from reduced prey from seabed disturbance and increased roposed Development alone is not hificant and therefore, it is considered in any adverse effects on site integrity.

sulting from plans or projects which have al overlap with the Proposed e 4 of Appendix 3) are considered to be I temporary.

dered that there is no potential for site integrity in combinationwith other on prey availability (see Appendix 1 urther details).

visual foragers and are likely to be ease in turbidity which can make it They are considered to be moderately disturbance (Bradbury *et al.*, 2014). d with construction, repair and have the potential to release sediment on during cable installation and .g. HDD pit excavation.

D will be used within Langstone hashore exit point, the volume of I is considered to be negligible.

he Harbour, excavation at the marine .6), and cable installation (due to the eration and dispersal of fines identified 15, and in other isolated locations) will sediments up to 10 km from the release shighly likely that SSC at these w (< 5 mg/l) and therefore not natural variation, which ranges from o 75 mg/l in coastal areas.

e Marine Cable Corridor, where foraging ties are likely to be much lower (Wilson ea of disturbed habitat for route

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					preparation is anticipaling the entire Marin common tern are not in high densities, give (15.2 km ± 11.2 km; nearshore area (KP C of up to 200 mg/l may of the cable trench/HI potentially persist for construction activities be transported up to which point concentra SSC is expected to re days following comple Most prey species are suspended sediment induced fluctuations in with high background Solent already (Guillo During operation, an Marine Cables would it is considered that p less than predicted d significant. As such, the potential from the Proposed D be significant and the result in any adverse Potential effects result temporal and spatial Development (Table highly localised and the adverse effects on si on prey species withi turbidity (see Append
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or cher during all developmen directly affect common through direct oiling r disposal of industrial phases also has the mortality through inge



pated to be a maximum of 3.6 km<sup>2</sup> rine Cable Corridor (c.6%). Breeding of expected to be present beyond KP 21 ven their mean-maximum foraging range (Thaxter *et al.*, 2012). Within this

0-21), it is predicted that a peak SSC ay be observed locally (i.e. within 2 km HDD pit) and these concentrations could r several hours following completion of es. Sediment plumes are also likely to 5 km from the cable trench/HDD pit at rations of 5 to 10 mg/l are predicted; return to background levels within a few oletion of these activities.

the able to tolerate a degree of the owing to frequent exposure to storm in sediment concentrations, together ad levels of suspended sediment in the lou *et al.*, 2017).

n indicative worst-case failure rate of the d require one repair every 10-12 years, potential increases in SSC would be during construction and therefore not

al for effects from increased turbidity Development alone is not predicted to berefore, it is considered that it will not e effects on site integrity.

ulting from plans or projects which have I overlap with the Proposed

e 4 of Appendix 3) are considered to be temporary.

ered that there is no potential for site integrity from in combination effects hin the water column from increased dix 1 PINS matrices for further details).

emical spillages from vessels may occur ent phases. Spills have the potential to non terns utilising the sea surface resulting in mortality. Unplanned I or user plastic during all development

potential to cause common tern gestion or entanglement.

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					However, routine mit practice in terms of w prevention measures make the likelihood of and therefore it is pre- mitigation measures, integrity. Given the scale and projects and the requ practice measures w effects, it is predicted site integrity alone or projects.
Supporting habitat (water column)	Maintaining or restoring the extent, distribution, structure, function and supporting processes of the habitats of the qualifying features	Indirect effects	Supporting habitat: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	DO levels affect the of habitats. High turbidit in warmer months. Lo impacts on key prey can adversely affect qualifying feature fee Activities associated maintenance works h and increase turbidity associated works. However, since HDD Harbour, with an ons suspended material i Outside of Langstone HDD pits (KP 1.0-1.6 potential for the libera between KP 5 and 18 transport the finest se point. However, it is h distances will be low discernible above nat approximately <5 to Elsewhere within the disturbed habitat for maximum of 3.6 km <sup>2</sup> (c.6%). It is predicted may be observed loc trench/HDD pit) and the persist for several ho construction activities



nitigation measures of standard best waste management, pollution es and strict navigational protocols will of these events occurring highly unlikely predicted that, in consideration of s, there will be no adverse effects on site

d nature of other potential plans and quirement to adhere to similar best which could contribute to in combination ed that there will be no adverse effect on or in combination with other plans and

e condition and health of supporting dity can lead to a drop in DO, especially Low DO can have sub-lethal and lethal y species (Best *et al.*, 2007) and hence et the availability and suitability of beding habitat.

d with construction, repair and have the potential to release sediment ity during cable installation and

D will be used within Langstone hashore exit point, the volume of I is considered to be negligible.

The Harbour, excavation at the marine .6), and cable installation (due to the eration and dispersal of fines identified 15, and in other isolated locations) will sediments up to 10 km from the release is highly likely that SSC at these w (< 5 mg/l) and therefore not natural variation, which ranges from 0.75 mg/l in coastal areas.

e Marine Cable Corridor, the area of r route preparation is anticipated to be a n<sup>2</sup> along the entire Marine Cable Corridor ed that a peak SSC of up to 200 mg/l ocally (i.e. within 2 km of the cable d these concentrations could potentially nours following completion of es. Sediment plumes are also likely to

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
-eature Conservation Objectives				be transported up to which point concentra SSC is expected to re days following comple During operation, an Marine Cables would it is considered that p less than predicted d significant. As such, the potentia the water column res Proposed Development significant and therefore result in any adverse Potential effects result temporal and spatial Development (Table highly localised and the As such, it is consider adverse effects on site on prey species within (see Appendix 1 PINS)	
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	A prolonged increase has a number of pote the water column, sur the filtering organs of turn can adversely af qualifying feature fee construction and mai release sediment and installation and assoc However, since HDD Harbour, with an onst suspended material i Outside of Langstone HDD pits (KP 1.0-1.6 potential for the libera between KP 5 and 15 transport the finest se point. However, it is h distances will be low discernible above nat



5 km from the cable trench/HDD pit at rations of 5 to 10 mg/l are predicted; return to background levels within a few pletion of these activities.

n indicative worst-case failure rate of the ld require one repair every 10-12 years, potential increases in SSC would be during construction and therefore not

al for impact on key prey species within sulting from a drop in DO from the nent alone is not predicted to be fore, it is considered that it will not e effects on site integrity.

ulting from plans or projects which have I overlap with the Proposed 4 of Appendix 3) are considered to be

temporary.

ered that there is no potential for site integrity from in combination effects hin the water column from a drop in DO NS matrices for further details).

se in turbidity through sediment release tential implications for prey species in uch as affecting fish health and clogging of suspension feeding animals. This in affect the availability and suitability of eding habitat. Activities associated with aintenance works have the potential to nd increase turbidity during cable ociated works.

D will be used within Langstone hashore exit point, the volume of l is considered to be negligible.

e Harbour, excavation at the marine 6), and cable installation (due to the ration and dispersal of fines identified 15, and in other isolated locations) will sediments up to 10 km from the release highly likely that SSC at these v (< 5 mg/l) and therefore not atural variation, which ranges from 75 mg/l in coastal areas.

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Elsewhere within the disturbed habitat for maximum of 3.6 km <sup>2</sup> (c.6%). It is predicted may be observed loc trench/HDD pit) and persist for several ho construction activities be transported up to which point concentra SSC is expected to r days following comp
					During operation, an Marine Cables would it is considered that p less than predicted d significant.
					As such, the potentia the water column res Proposed Developm significant and theref result in any adverse
					Potential effects result temporal and spatial Development (Table highly localised and
					As such, it is consider adverse effects on si of increased turbidity Appendix 1 PINS ma
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or che during all developme directly affect prey sp a range of biological industrial or user plas has the potential to a entanglement.
					However, routine mit practice in terms of v prevention measures make the likelihood of and therefore it is pre-



e Marine Cable Corridor, the area of r route preparation is anticipated to be a n<sup>2</sup> along the entire Marine Cable Corridor ed that a peak SSC of up to 200 mg/l ocally (i.e. within 2 km of the cable d these concentrations could potentially nours following completion of es. Sediment plumes are also likely to

o 5 km from the cable trench/HDD pit at trations of 5 to 10 mg/l are predicted; return to background levels within a few pletion of these activities.

n indicative worst-case failure rate of the ld require one repair every 10-12 years, potential increases in SSC would be during construction and therefore not

ial for impact on key prey species within esulting from increased turbidity from the nent alone is not predicted to be efore, it is considered that it will not se effects on site integrity.

sulting from plans or projects which have al overlap with the Proposed e 4 of Appendix 3) are considered to be d temporary.

dered that there is no potential for site integrity from in combination effects ty from other plans and projects (see natrices for further details).

emical spillages from vessels may occur ent phases. Spills have the potential to species within the water column through al effects. Unplanned disposal of astic during all development phases also affect prey species through ingestion or

nitigation measures of standard best waste management, pollution es and strict navigational protocols will of these events occurring highly unlikely predicted that, in consideration of

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					mitigation measures, effects on site integrit
					Given the scale and r projects and the requ practice measures wh effects, it is predicted site integrity in combi

Conclusion: No significant adverse effect on site integrity can be concluded, either from the Proposed Development alone, or in combination with other plans or projects, for the Solent and Dorset Coast pSPA.



s, there will be no significant adverse grity.

d nature of other potential plans and quirement to adhere to similar best which could contribute to in combination ed that there will be no adverse effect on abination with other plans and projects.

WSP/Natural Power



## 10.4. CHICHESTER AND LANGSTONE HARBOURS SPA/RAMSAR SITE

#### 10.4.1. **OVERVIEW**

- 10.4.1.1. Chichester and Langstone Harbours SPA covers two large, estuarine basins. Urban development surrounds the west of Langstone Harbour, whereas farmland surrounds the majority of Chichester Harbour. Together, with neighbouring Portsmouth Harbour, the area forms one of the most sheltered intertidal areas on the south coast of England.
- 10.4.1.2. Both Chichester and Langstone Harbours contain extensive intertidal mudflats and sandflats with areas of seagrass beds, saltmarsh, shallow coastal waters, coastal lagoons, coastal grazing marsh and shingle ridges and islands. These habitats support internationally and nationally important numbers of overwintering and breeding bird species.
- 10.4.1.3. At low tide the mudflats are exposed, the water is drained by channels and creeks which meet to form narrow exits into the Solent. The sediments support rich populations of intertidal invertebrates, which provide an important food source for overwintering birds. Several small freshwater streams flow into the harbours; however, these contribute relatively little freshwater input compared to the tidal flows.
- 10.4.1.4. There are more than 300 ha of seagrass beds (*Zostera noltii* and *Zostera marina*) in the SPA which are an important food source for dark-bellied brent geese (Natural England, 2019a). Overwintering birds also feed and roost in the saltmarsh areas, which are dominated by cordgrass (*Spartina*) swards, as well as on coastal grazing marsh.
- 10.4.1.5. The shingle ridges and islands within the site provide important nesting habitat for three species of tern during the summer breeding season. Adult terns use the shallow coastal waters in the harbours and the wider Solent to forage for small fish to feed themselves and their chicks.
- 10.4.1.6. Areas outside the SPA contain important supporting habitats for the birds, including coastal grazing marsh, amenity grassland and agricultural land (Natural England, 2019a).

#### 10.4.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.4.2.1. Site-specific SACO is available for the Chichester and Langstone Harbours SPA<sup>38</sup>.
 Table 10-3 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded for the marine environment.



Feature	Impact for which LSE could not be excluded	Equivalent attribute
Red-breasted merganser Little tern	Disturbance and displacement	Disturbance caused by human activity
Red-breasted merganser Little tern	Indirect effects	Supporting habitat: food availability
Sandwich tern Common tern		Supporting habitat: water quality - turbidity
	Accidental spills and Litter	Supporting habitat: water quality - contaminants
Supporting habitat (water column)	Indirect effects	Supporting habitat: water quality - DO
		Supporting habitat: water quality - turbidity
	Accidental spills and Litter	Supporting habitat: water quality - contaminants

# Table 10.3 - SACO attributes screened in for assessment – marine

- 10.4.2.2. Non-equivalent attributes listed within the SACO which were screened out from further assessment included:
  - Breeding population: abundance;
  - Connectivity with supporting habitats;
  - Predation all habitats;
  - Supporting habitat: air quality;
  - Supporting habitat: conservation measures;
  - Supporting habitat: extent and distribution of supporting habitat for the breeding season;
  - Supporting habitat: landform;
  - Supporting habitat: vegetation characteristics for nesting; and
  - Supporting habitat: water quality nutrients.



10.4.2.3. Table 10-4 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded for the onshore environment.

 Table 10.4 - SACO attributes screened in for assessment – onshore

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Dark-bellied brent goose Redshank Shelduck Pintail Shoveler Teal Wigeon Bar-tailed godwit Curlew	Disturbance and displacement	Disturbance caused by human activity
Little tern Sandwich tern Common tern Dark-bellied brent goose Redshank Shelduck Pintail Shoveler Teal Wigeon Bar-tailed godwit Curlew Turnstone Sanderling Grey plover Ringed plover Dunlin	Accidental spills and Litter	Supporting habitat: food availability



Feature	Impact for which LSE could not be excluded	Equivalent attribute	
Supporting habitat	Accidental spills and Litter	Supporting habitat: water quality – contaminants	

### 10.4.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.4.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Tables 10-5 and 10-6 below.
- 10.4.3.2. It is concluded that there will be no adverse effects on site integrity for the Chichester and Langstone Harbours SPA/Ramsar site, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10.5 - Assessment of potential adverse effects on site integrity for the Chichester and Langstone Harbours SPA/Ramsar site across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
Red-breasted merganser	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Red-breasted merganse sensitivity to disturbance (Bradbury <i>et al.</i> , 2014; G Within Langstone Harbook known to both feed and numbers. It is considered harbour have the highes to cause disturbance and three onshore HDD locat the Proposed Developm Wharf is the closest locat merganser roosting areat towards Langstone Bridg location may therefore do unpredictable noise even However, these works we industrialised setting. Vil duration (two hours for in levels from the EMV at H Marshes, given that SPL distance is doubled. Nois with construction activities be noticeable above bas urban setting of Langston Cutts <i>et al.</i> , 2009). Given further away from red-br considered that there is HDD works at these locat above MHWS in an urbat Outside of Langstone Hat be present in shallow, ne Solent. There is therefore birds to be disturbed and unpredictable noise even with construction activities Eastney, and elsewhere Vibro-hammering at the duration and noise gene driving machine will be r are unlikely to be noticeat setting. Red-breasted m to forage in water depths



er are considered to be of moderate ce and therefore displacement Gittings & O'Donoghue, 2016).

our, red-breasted mergansers are d roost in internationally important ed that onshore HDD works within the est potential of all construction activities nd displacement to this species. Of the ations (see Chapter 3 Description of ment for locations), HDD3 at Kendall's cation to favoured red-breasted eas east of Farlington Marshes and dge (c.1 km). Sheet piling at this disturb and displace birds through ents.

will be above MHWS in an already /ibro-hammering will be very short in installation at each location) and noise HDD3 will be < 50 dB at Farlington PLs reduce by 6 dB each time the bise and visual disturbance associated ties at HDD3 are therefore unlikely to aseline levels of disturbance within the tone Harbour (Cutts & Allen, 1999; en that HDD1 and HDD2 are located preasted merganser roosting areas, it is s no potential for impact from onshore cations, both of which are located oan environment

Harbour, red-breasted mergansers may nearshore waters throughout the pre potential for foraging and roosting nd therefore displaced by both ents and visual disturbance associated ties at the marine HDD location off e within the Marine Cable Corridor. e marine HDD location will be short in nerated by the vibro-hammers and pipenon-percussive and airbourne SPLs eable above the baseline in this urban mergansers dive from the sea surface hs of <10 m (Robbins, 2017). Whilst

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					they may be exposed to vibro-hammer and pipe highly unlikely noise level background underwater around the UK range fro <i>et al.</i> , 2016). A single jac a safety vessel, a crew to workboats may be prese to 44 weeks, with a total over this period. This is baseline levels of disturb traffic within the area. Throughout the rest of the anticipated that there may over the course of the th Construction vessels su have difficulty in manoer distance of up to 700 m. vessels present during et that each vessel will only rolling safe passage dis days). The potential gro between KP 1.0 and KP up to 4 weeks Furthermo and Solent are already for mergansers that use the roost are expected to be disturbance.
					During operation, an inc Marine Cables would re is therefore considered disturbance/displacement would be less than pred Therefore, it is considered displacement from the F result in an adverse effe qualifying feature of this effects on site integrity a Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is considered effects on site integrity f



to underwater noise resulting from the e driving machine during this time, it is vels will be discernable above er noise levels (median noise levels rom 81.5 to 95.5 dB re 1  $\mu$ Pa; Merchant ack-up vessel, together with a multicat,  $\mu$  transfer vessel and up to four sent at the marine HDD location for up al of 636 vessel movements predicted s unlikely to be noticeable above urbance from the existing high levels of

the Marine Cable Corridor, it is nay be up to c.825 vessel movements the 30-month construction period. uch as the larger CLVs and barges that euvring will have a rolling safe passage n. Whilst there may be a number of each stage of installation, it is likely hy be present in any one area of the stance for very short durations (hours to ounding of cable lay barges at low tide P 4.7 will occur over a short duration of nore, vessel traffic levels in the Channel high. As such, red-breasted me Marine Cable Corridor to forage and be habituated to such levels of

ndicative worst-case failure rate of the equire one repair every 10-12 years. It I that potential

ent effects on red-breasted mergansers dicted during construction.

ered that potential disturbance and Proposed Development alone will not fect on red-breasted merganser as a s SPA, and therefore no adverse are predicted.

ng from plans or projects which have verlap with the Proposed Development ) are considered to be highly localised

ed that there is no potential for adverse from disturbance and displacement

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					effects, either alone or in plans (see Appendix 1 F
		Indirect effects	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. salmon, brook lamprey, minnow, gobies, eels, stickleback, gobies, flatfish, herring, shrimps, <i>Nereis</i> ) at preferred sizes (e.g.<11 cm)	Red-breasted merganse benthos, fish and shellfis be of moderate sensitivi <i>al.</i> , 2014). If seabed had are disturbed, the area of potential food sources, in Furthermore, red-breast and are likely to be affect can make it harder to se construction have the per- water column during cal Within Langstone Harbor numbers are likely to be entry/exit points of the d there is no pathway for f suspended sediment or works are not predicted merganser prey species Outside of Langstone H pits (KP 1.0-1.6), and ca the liberation and dispen- and 15, and in other iso sediments up to 10 km f highly likely that SSC at and therefore not discer ranges from approximat Effects on prey species considered to be signific disturbance/loss and ind short in duration and sm Elsewhere within the Ma disturbed habitat for rou maximum of 3.6 km <sup>2</sup> ald (c.6%). High densities of predicted beyond KP 21 shallow, coastal waters area where densities are predicted that a peak SS locally (i.e. within 2 km of concentrations could po following completion of plumes are also likely to cable trench/HDD pit at



in combination with other project and PINS matrices for further details).

sers are effectively top predators of fish populations and are considered to vity to habitat disturbance (Bradbury *et* abitats (and therefore the prey species) may be temporarily devoid of any

resulting in effective habitat loss. sted mergansers are visual foragers ected by an increase in turbidity which see prey. Activities associated with potential to release sediment into the able burial and associated works.

bour where red-breasted merganser be highest, HDD will be used. The drill are expected to be onshore, thus r the works to result in an increase in or resultant smothering. Therefore, the d to significantly affect red-breasted es in Langstone Harbour.

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest a from the release point. However, it is at these distances will be low (< 5 mg/l) emible above natural variation, which ately <5 to 75 mg/l in coastal areas. s at the Landfall are therefore not ficant since both habitat horeases in SSC will be temporary,

mall in extent.

Aarine Cable Corridor, the area of oute preparation is anticipated to be a long the entire Marine Cable Corridor of red-breasted merganser are not 21 given the species' preference for is (Robbins, 2017). Within the nearshore are likely tpbe highest (KP 0-21, it is SSC of up to 200 mg/l may be observed of the cable trench/HDD pit) and these otentially persist for several hours f construction activities. Sediment to be transported up to 5 km from the at which point concentrations of 5 to 10

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
	-				mg/l are predicted; SSC levels within a few days activities.
					Most fish and shellfish a suspended sediment ow induced fluctuations in s background levels of sus already highly turbid (Gu
					During operation, within that there is no pathway of the cable crossing.
					Outside of Langstone H shellfish habitat as a res predicted to significantly measures will be limited
					Given that an indicative Cables would require or considered that potentia predicted during constru
					Therefore, it is consider availability resulting from increased turbidity from not predicted to result in integrity.
					Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary.
					As such, it is considered effects on site integrity f either alone or in combi (see Appendix 1 PINS n
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Red-breasted merganse be affected by an increat harder to see prey. They sensitive to habitat distu Activities associated wit maintenance works have the water column during HDD pit excavation. However, since HDD wi with an onshore exit poi



C is expected to return to background s following completion of these

are able to tolerate a degree of owing to frequent exposure to storm sediment concentrations. Indeed, uspended sediment in the Solent are Guillou *et al.*, 2017).

n Langstone Harbour, it is considered y for impact due to the onshore nature

Harbour, the permanent loss of fish and esult of cable non-burial protection is not ly affect prey availability since these ed in spatial extent (*c*. 0.67 km<sup>2</sup>). e worst-case failure rate of the Marine one repair every 10-12 years, it is ial increases in SSC would be less than ruction and therefore not significant. ered that potential effects on prey om seabed disturbance/loss and in the Proposed Development alone is in a significant adverse effect on site

ng from plans or projects which have verlap with the Proposed Development ) are considered to be highly localised

ed that there is no potential for adverse from disturbance and displacement, pination with other project and plans matrices for further details).

sers are visual foragers and are likely to ease in turbidity which can make it ey are considered to be moderately turbance (Bradbury *et al.*, 2014). with construction, repair and ve the potential to release sediment into ng cable burial and associated works e.g

vill be used within Langstone Harbour, bint, the volume of suspended material gligible.

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Outside of Langstone H pits (KP 1.0-1.6), and ca the liberation and dispe and 15, and in other iso sediments up to 10 km highly likely that SSC at and therefore not discer ranges from approximat Effects on prey species considered to be signific increases in SSC will be
					small in extent. Elsewhere within the Ma disturbed habitat for rou maximum of 3.6 km <sup>2</sup> ald ( <i>c</i> .6%). High densities of predicted beyond KP 27 shallow, coastal waters area where densities ar predicted that a peak Sa locally (i.e. within 2 km of concentrations could por following completion of plumes are also likely to cable trench/HDD pit at mg/l are predicted; SSC levels within a few days activities.
					During operation, an inc Marine Cables would re is considered that poten than predicted during co significant.
					As such, the potential for resulting from increased Development alone will red-breasted merganse adverse effects on site Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3)
					and temporary. As such, it is considered effects on site integrity f water column from incre



Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest a from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which ately <5 to 75 mg/l in coastal areas. s at the Landfall are therefore not ficant since both habitat disturbance and be temporary, short in duration and

Marine Cable Corridor, the area of oute preparation is anticipated to be a long the entire Marine Cable Corridor of red-breasted merganser are not 21 given the species' preference for is (Robbins, 2017). Within the nearshore are likely tpbe highest (KP 0-21, it is SSC of up to 200 mg/l may be observed of the cable trench/HDD pit) and these otentially persist for several hours if construction activities. Sediment to be transported up to 5 km from the at which point concentrations of 5 to 10 C is expected to return to background is following completion of these

ndicative worst-case failure rate of the equire one repair every 10-12 years, it ential increases in SSC would be less construction and therefore not

for effects from reduced prey availability ed turbidity from the Proposed Il not adversely affect the integrity of er, and there will therefore be no integrity.

ng from plans or projects which have verlap with the Proposed Development ) are considered to be highly localised

ed that there is no potential for adverse from effects on prey species within the reased turbidity, either alone or in

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					combination with other p PINS matrices for furthe
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemic during all development directly affect red-breas surface through direct or disposal of industrial or phases also has the pot merganser mortality thro However, routine mitiga practice in terms of was measures and strict nav likelihood of these even predicted that, in consid will be no adverse effect Given the scale and nat projects and the require measures which could of predicted that there will either alone or in combi (see Appendix 1 PINS r
Little tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, nesting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Little terns at sea are so to disturbance and there 2004; Bradbury <i>et al.</i> , 2 Within Langstone and C of little tern are present. forage in relatively close onshore HDD works wit potential to displace this moderate sensitivity to c onshore HDD locations, closest location to a little minimum distance of <i>c.</i> Sheet piling at HDD3 m foraging birds through u However, these works w industrialised setting. Vi duration (two hours for i levels from the EMV at I Island, given that SPLs is doubled. Noise and vi construction activities at noticeable above baseli Langstone Harbour (Cur



r project and plans (see Appendix 1 ner details).

nical spillages from vessels may occur t phases. Spills have the potential to asted mergansers utilising the sea oiling resulting in mortality. Unplanned or user plastic during all development otential to cause red-breasted brough ingestion or entanglement. gation measures of standard best aste management, pollution prevention avigational protocols will make the ents occurring highly unlikely and it is ideration of mitigation measures, there exists on site integrity.

ature of other potential plans and rement to adhere to similar best practice I contribute to in combination effects, it is ill be no adverse effect on site integrity bination with other plans and projects matrices for further details).

scored as being of moderate sensitivity refore displacement (Garthe & Hüppop, 2014).

Chichester Harbours, breeding colonies nt. Given that little terns are known to se proximity to their breeding colonies, within the Langstone Harbour have his species during foraging given its o disturbance at sea. Of the three s, HDD3 at Kendall's Wharf is the ttle tern breeding colony, located at a c.2 km from the Baker's Island colony. may therefore disturb and displace unpredictable noise events.

will be above MHWS in an already Vibro-hammering will be very short in r installation at each location) and noise at HDD3 will be *c*.40 dB at Baker's s reduce by 6 dB each time the distance visual disturbance associated with at HDD3 are therefore unlikely to be beline levels of disturbance within Cutts & Allen, 1999; Cutts *et al.*, 2009).

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Whilst considered unlike
					disturbed from foraging
					within Langstone Harbo
					present elsewhere in Cl which will be unaffected
					Given that HDD1 and H little tern breeding color
					potential for impact from
					locations, both of which
					environment.
					Outside of Langstone H
					shallow, nearshore wate
					There is therefore poter
					and therefore displaced
					and visual disturbance a
					at the marine HDD loca
					Vibro-hammering at the
					duration and noise gene
					driving machine will be
					are unlikely to be notice setting. Since little terns
					whilst feeding (RPS, 20
					any underwater noise re
					pipe driving machine wi
					above background under
					levels around the UK ra
					Merchant <i>et al.</i> , 2016).
					multicat, a safety vesse
					workboats may be pres
					to 44 weeks, with a tota over this period. The po
					low tide between KP 1.
					duration of up to 4 week
					above baseline levels o
					levels of traffic within the
					Given that the foraging
					nearshore waters up to
					<i>et al.,</i> 2015), it is unlikel
					this range will impact the
					that there may be up to
					course of the construction
					Corridor, including at the
					month construction peri larger CLVs and barges
					have a rolling safe pass



kely, should little terns be temporarily g in proximity to the onshore HDD works oour, other equivalent foraging sites are Chichester and Langstone Harbours ed by the Proposed Development. HDD2 are located further away from onies, it is considered that there is no om onshore HDD works at these th are located above MHWS in an urban

Harbour, little terns may be present in aters at the mouth of Langstone Harbour. ential for foraging birds to be disturbed ed by both unpredictable noise events e associated with construction activities ration off Eastney.

e marine HDD location will be short in nerated by the vibro-hammers and pipenon-percussive and airbourne SPLs eable above the baseline in this urban ns plunge dive to a maximum of 1 m 2011), it is considered that exposure to resulting from the vibro-hammer and ill be minimal and not discernable lerwater noise levels (median noise range from 81.5 to 95.5 dB re 1  $\mu$ Pa; A single jack-up vessel, together with a el, a crew transfer vessel and up to four sent at the marine HDD location for up tal of 636 vessel movements predicted otential grounding of cable lay barges at .0 and KP 4.7 will occur over a short ks. This is unlikely to be noticeable of disturbance from the existing high ne area.

g range of little terns is restricted to o c.10 km (Thaxter *et al.*, 2012; Parsons ely that construction activities beyond his feature. However, it is anticipated o c.825 vessel movements over the tion stage throughout the Marine Cable he marine HDD location, over the 30riod. Construction vessels such as the es that have difficulty in manoeuvring will ssage distance of up to 700 m. Whilst

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					there may be a number of installation, it is likely in any one area of the ro short durations (hours to levels in the Channel an little terns which use the expected to be habituate Therefore, potential dist from the Proposed Deve adverse effect on the int feature of this SPA, and effects on site integrity. Potential effects resulting temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is considered effects on site integrity f either alone or in combin
		Indirect effects	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. crustacea, annelids, sandeel, herring, clupeidae) at preferred sizes.	<ul> <li>(see Appendix 1 PINS n Little terns are effectively shellfish populations and moderate sensitivity to h 2004; Bradbury <i>et al.</i>, 20 the prey species) are dis devoid of any potential f habitat loss. Furthermore likely to be affected by a it harder to see prey from associated with construct sediment into the water associated works.</li> <li>Within Langstone Harboo may be high, HDD will b drill are expected to be o the works to result in an resultant smothering. The significantly affect tern p Outside of Langstone Harboo pits (KP 1.0-1.6), and can the liberation and disper and 15, and in other ison sediments up to 10 km f highly likely that SSC at</li> </ul>



r of vessels present during each stage ly that each vessel will only be present rolling safe passage distance for very to days). Furthermore, vessel traffic and Solent are already high. As such, he Marine Cable Corridor to forage are ated to such levels of disturbance.

sturbance and displacement effects velopment alone will not result in an integrity of little tern as a qualifying ad there will therefore be no adverse

ing from plans or projects which have verlap with the Proposed Development 3) are considered to be highly localised

ed that there is no potential for adverse from disturbance and displacement, pination with other project and plans matrices for further details).

ely top predators of benthos, fish and ind are considered likely to be of b habitat disturbance (Garthe & Hüppop, 2014). If seabed habitats (and therefore disturbed, the area may be temporarily I food sources, resulting in effective ore, terns are visual foragers and are or an increase in turbidity which can make om the sea surface. Activities uction have the potential to release er column during cable burial and

bour where foraging little terns numbers be used. The entry/exit points of the e onshore, thus there is no pathway for an increase in suspended sediment or Therefore, the works are not predicted to prey species in Langstone Harbour.

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 solated locations) will transport the finest in from the release point. However, it is at these distances will be low (< 5 mg/l)

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					and therefore not discer ranges from approximate Effects on prey species considered to be signific increases in SSC will be small in extent.
					Elsewhere within the Ma little tern densities are lik 2015), the area of distur anticipated to be a maxin Marine Cable Corridor (a expected to be present k maximum foraging range 2012). Within this nears that a peak SSC of up to (i.e. within 2 km of the ca concentrations could por following completion of o plumes are also likely to cable trench/HDD pit at mg/l are predicted; SSC levels within a few days activities.
					Most prey species are a sediment owing to frequ fluctuations in sediment background levels of su already (Guillou, <i>et al.</i> , 2
					During operation, within that there is no pathway of the cable crossing.
					Outside of Langstone Hapermanent loss of fish, so of cable non-burial prote affect prey availability si spatial extent (c.0.67 km
					Given that an indicative Cables would require or considered that potentia predicted during constru
					As such, the potential for resulting from seabed di from the Proposed Deve affect little tern, and ther on site integrity.



ernible above natural variation, which ately <5 to 75 mg/l in coastal areas. s at the Landfall are therefore not icant since both habitat disturbance and be temporary, short in duration and

larine Cable Corridor, where foraging likely to be much lower (Parsons et al., urbed habitat for route preparation is ximum of 3.6 km<sup>2</sup> along the entire (c.6%). Breeding little tern are not beyond KP 21 given their meange (6.3 km ± 2.4 km; Thaxter et al., shore area (KP 0 - 21), it is predicted to 200 mg/l may be observed locally cable trench/HDD pit) and these otentially persist for several hours construction activities. Sediment to be transported up to 5 km from the t which point concentrations of 5 to 10 C is expected to return to background s following completion of these

able to tolerate a degree of suspended uent exposure to storm induced at concentrations, together with high uspended sediment in the Solent 2017).

n Langstone Harbour, it is considered y for impact due to the onshore nature

Harbour during operation, the shellfish and benthic habitat as a result tection is not predicted to significantly since these measures will be limited in m<sup>2</sup>).

e worst-case failure rate of the Marine one repair every 10-12 years, it is al increases in SSC would be less than ruction and therefore not significant.

for effects from reduced prey availability disturbance/loss and increased turbidity velopment alone will not adversely ere will therefore be no adverse effects

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Potential effects resulting temporal and spatial over (Table 4 of Appendix 3) and temporary. As such, it is considered effects on site integrity fr alone or in combination Appendix 1 PINS matrice
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Little terns are visual for an increase in turbidity w They are considered to b disturbance (Bradbury e construction, repair and to release sediment into installation and associate However, since HDD wil with an onshore exit poin is considered to be negli Outside of Langstone Ha pits (KP 1.0-1.6), and ca the liberation and disper and 15, and in other isol sediments up to 10 km fr highly likely that SSC at and therefore not discern ranges from approximate Effects on prey species a considered to be signific increases in SSC will be small in extent. Elsewhere within the Ma little tern densities are lik 2015), the area of disturt anticipated to be a maxin Marine Cable Corridor (d expected to be present b maximum foraging range 2012). Within this nearsh that a peak SSC of up to (i.e. within 2 km of the ca concentrations could pot following completion of c plumes are also likely to cable trench/HDD pit at w mg/l are predicted; SSC



ng from plans or projects which have verlap with the Proposed Development ) are considered to be highly localised

ed that there is no potential for adverse from effects on prey availability, either n with other project and plans (see ces for further details).

bragers and are likely to be affected by which can make it harder to see prey. be moderately sensitive to habitat *et al.*, 2014). Activities associated with d maintenance works have the potential to the water column during cable ated works e.g. HDD pit excavation. will be used within Langstone Harbour, pint, the volume of suspended material gligible.

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which ately <5 to 75 mg/l in coastal areas. s at the Landfall are therefore not icant since both habitat disturbance and be temporary, short in duration and

Aarine Cable Corridor, where foraging likely to be much lower (Parsons *et al.*, urbed habitat for route preparation is ximum of 3.6 km<sup>2</sup> along the entire (*c*.6%). Breeding little tern are not t beyond KP 21, given their meange (6.3 km  $\pm$  2.4 km; Thaxter *et al.*, shore area (KP 0 – 21), it is predicted to 200 mg/l may be observed locally cable trench/HDD pit) and these totentially persist for several hours f construction activities. Sediment to be transported up to 5 km from the at which point concentrations of 5 to 10 C is expected to return to background

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					levels within a few days activities. During operation, an ind Marine Cables would re is considered that poten than predicted during co significant. As such, the potential for resulting from increased Development alone is n adverse effect on site in Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is considered site integrity from effects column, either alone or
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	<ul> <li>plans (see Appendix 1 F</li> <li>Unplanned oil or chemic during all development p</li> <li>directly affect little terns oiling resulting in mortaling user plastic during all development.</li> <li>However, routine mitigation</li> <li>practice in terms of wasting</li> <li>measures and strict navelikelihood of these event therefore it is predicted to measures, there will be from the Proposed Development</li> <li>Given the scale and nation</li> <li>predicted that there will combination with other p</li> <li>PINS matrices for furthe</li> </ul>
Sandwich tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Indirect effects	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. crustacea, annelids, sandeel, herring, clupeidae) at preferred sizes.	Sandwich terns are effe and shellfish populations moderate sensitivity to h 2004; Bradbury <i>et al.</i> , 2 the prey species) are di



### s following completion of these

ndicative worst-case failure rate of the require one repair every 10-12 years, it ential increases in SSC would be less construction and therefore not

for effects from reduced prey availability ed turbidity from the Proposed not predicted to result in a significant integrity.

ing from plans or projects which have overlap with the Proposed Development 3) are considered to be highly localised

ed that there are no adverse effects on cts on prey species within the water or in combination with other project and I PINS matrices for further details).

nical spillages from vessels may occur t phases. Spills have the potential to ns utilising the sea surface through direct ality. Unplanned disposal of industrial or development phases also has the e tern mortality through ingestion or

gation measures of standard best aste management, pollution prevention avigational protocols will make the ents occurring highly unlikely and d that, in consideration of mitigation be no adverse effects on site integrity evelopment alone.

ature of other potential plans and rement to adhere to similar best practice I contribute to in combination effects, it is ill be no adverse effect on site integrity in r plans and projects (see Appendix 1 her details).

fectively top predators of benthos, fish ons and are considered likely to be of b habitat disturbance (Garthe & Hüppop, 2014). If seabed habitats (and therefore disturbed, the area may be temporarily

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					devoid of any potential for habitat loss. Furthermore likely to be affected by a it harder to see prey from associated with construct sediment into the water associated works.
					Within Langstone Harbo points of the drill are exp pathway for the works to sediment or resultant sn predicted to affect signif Harbour.
					Outside of Langstone Ha pits (KP 1.0-1.6), and ca the liberation and disper and 15, and in other isol sediments up to 10 km f highly likely that SSC at and therefore not discer ranges from approximate Effects on prey species considered to be signific increases in SSC will be small in extent.
					Elsewhere within the Ma Sandwich tern densities the area of disturbed hal anticipated to be a maxi Marine Cable Corridor ( distributions presented i of breeding Sandwich te Within the area of higher peak SSC of up to 200 r within 2 km of the cable
					concentrations could por following completion of or plumes are also likely to cable trench/HDD pit at mg/l are predicted; SSC levels within a few days activities.
					Most prey species are a sediment owing to freque fluctuations in sediment



food sources, resulting in effective re, terns are visual foragers and are an increase in turbidity which can make om the sea surface. Activities action have the potential to release r column during cable burial and

oour, HDD will be used. The entry/exit expected to be onshore, thus there is no to result in an increase in suspended mothering. Therefore, the works are not ificantly tern prey species in Langstone

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which ately <5 to 75 mg/l in coastal areas. Is at the Landfall are therefore not icant since both habitat disturbance and be temporary, short in duration and

larine Cable Corridor, where foraging s may be lower (Wilson et al., 2014), abitat for route preparation is kimum of 3.6 km<sup>2</sup> along the entire (c.6%). Based on the predicted usage in Wilson et al., (2014), high densities terns are not expected beyond KP 21. est use (KP 0-21), it is predicted that a mg/l may be observed locally (i.e. e trench/HDD pit) and these otentially persist for several hours construction activities. Sediment to be transported up to 5 km from the t which point concentrations of 5 to 10 C is expected to return to background s following completion of these

able to tolerate a degree of suspended uent exposure to storm induced at concentrations, together with high

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					background levels of sus already (Guillou, <i>et al.</i> , 2 During operation, within that there is no pathway of the cable crossing. Outside of Langstone Ha permanent loss of fish, so of cable non-burial prote affect prey availability si spatial extent ( <i>c</i> .0.67 km Given that an indicative Cables would require on considered that potential predicted during construe As such, the potential for resulting from seabed di from the Proposed Deve significant and therefore in any adverse effects o Potential effects resulting temporal and spatial over (Table 4 of Appendix 3) and temporary. As such, adverse effects on site i prey availability, either a project and plans (see A details).
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Sandwich terns are visual affected by an increase see prey. They are consistent disturbance (Bray associated with construct have the potential to relate during cable installation since HDD will be used with onshore exit point, the with considered to be negligit Outside of Langstone Has pits (KP 1.0-1.6), and cas the liberation and disper and 15, and in other isol sediments up to 10 km fith highly likely that SSC at and therefore not discert



uspended sediment in the Solent 2017).

n Langstone Harbour, it is considered y for impact due to the onshore nature

Harbour during operation, the

shellfish and benthic habitat as a result tection is not predicted to significantly since these measures will be limited in m<sup>2</sup>).

e worst-case failure rate of the Marine one repair every 10-12 years, it is al increases in SSC would be less than ruction and therefore not significant.

for effects from reduced prey availability disturbance/loss and increased turbidity velopment alone is not predicted to be e, it is considered that it will not result on site integrity.

ng from plans or projects which have verlap with the Proposed Development b) are considered to be highly localised h, it is considered that there are no integrity from in combination effects on alone or in combination with other Appendix 1 PINS matrices for further

ual foragers and are likely to be e in turbidity which can make it harder to hisidered to be moderately sensitive to radbury *et al.*, 2014). Activities function, repair and maintenance works elease sediment into the water column in and associated works. However, d within Langstone Harbour, with an volume of suspended material is gible.

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					ranges from approximat Effects on prey species considered to be signific increases in SSC will be small in extent. Elsewhere within the Ma Sandwich tern densities the area of disturbed ha anticipated to be a maxi Marine Cable Corridor ( distributions presented of breeding Sandwich te Within the area of highe peak SSC of up to 200 f within 2 km of the cable concentrations could po following completion of plumes are also likely to cable trench/HDD pit at mg/l are predicted; SSC levels within a few days activities. During operation. an ind Marine Cables would re is considered that potent than predicted during co significant. As such, the potential for resulting from increased Development alone is m therefore, it is considered effects on site integrity. Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is considered site integrity from effects column, either alone or plans (see Appendix 1 F
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to	Unplanned oil or chemic during all development directly affect Sandwich direct oiling resulting in



ately <5 to 75 mg/l in coastal areas. Is at the Landfall are therefore not ficant since both habitat disturbance and be temporary, short in duration and

larine Cable Corridor, where foraging es may be lower (Wilson et al., 2014), abitat for route preparation is ximum of 3.6 km<sup>2</sup> along the entire (c.6%). Based on the predicted usage in Wilson et al., (2014), high densities terns are not expected beyond KP 21. est use (KP 0-21), it is predicted that a mg/l may be observed locally (i.e. e trench/HDD pit) and these otentially persist for several hours f construction activities. Sediment to be transported up to 5 km from the t which point concentrations of 5 to 10 C is expected to return to background s following completion of these

ndicative worst-case failure rate of the equire one repair every 10-12 years, it ential increases in SSC would be less construction and therefore not

for effects from reduced prey availability ad turbidity from the Proposed not predicted to be significant and red that it will not result in any adverse

ng from plans or projects which have verlap with the Proposed Development ) are considered to be highly localised

ed that there are no adverse effects on ts on prey species within the water r in combination with other project and PINS matrices for further details).

ical spillages from vessels may occur phases. Spills have the potential to h terns utilising the sea surface through mortality. Unplanned disposal of

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
				Annex X of the WFD, avoiding deterioration from existing levels.	industrial or user plastic has the potential to cause ingestion or entangleme However, routine mitiga practice in terms of was measures and strict nav likelihood of these event therefore it is predicted to measures, there will be integrity. Given the scale and nate projects and the required measures which could of predicted that there will combination with other p
Common tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Indirect effects	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. crustacea, annelids, sandeel, herring, clupeidae) at preferred sizes.	Common terns are effect and shellfish populations moderate sensitivity to h 2004; Bradbury <i>et al.</i> , 24 the prey species) are dis devoid of any potential f habitat loss. Furthermore likely to be affected by a it harder to see prey from associated with construct sediment into the water associated works e.g. H Within Langstone Harbor points of the drill are exp pathway for the works to sediment or resultant sm predicted to significantly Harbour. Outside of Langstone H pits (KP 1.0-1.6), and ca the liberation and dispen and 15, and in other iso sediments up to 10 km f highly likely that SSC at and therefore not discer ranges from approximat Effects on prey species considered to be signific increases in SSC will be small in extent.



tic during all development phases also use Sandwich tern mortality through nent.

gation measures of standard best aste management, pollution prevention avigational protocols will make the ents occurring highly unlikely and d that, in consideration of mitigation be no significant adverse effects on site

ature of other potential plans and rement to adhere to similar best practice I contribute to in combination effects, it is ill be no adverse effect on site integrity in r plans and projects.

ectively top predators of benthos, fish ons and are considered likely to be of b habitat disturbance (Garthe & Hüppop, 2014). If seabed habitats (and therefore disturbed, the area may be temporarily I food sources, resulting in effective ore, terns are visual foragers and are v an increase in turbidity which can make rom the sea surface. Activities ruction have the potential to release er column during cable installation and

HDD pit excavation.

bour, HDD will be used. The entry/exit expected to be onshore, thus there is no to result in an increase in suspended smothering. Therefore, the works are not tly affect tern prey species in Langstone

Harbour, excavation at the marine HDD cable installation (due to the potential for bersal of fines identified between KP 5 solated locations) will transport the finest in from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which ately <5 to 75 mg/l in coastal areas. es at the Landfall are therefore not ficant since both habitat disturbance and be temporary, short in duration and

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute	Target	Elsewhere within the Ma common tern densities r area of disturbed habita be a maximum of 3.6 km Corridor (c.6%). Breedir present beyond KP 21 if maximum foraging rang 2012). Within this nears that a peak SSC of up to (i.e. within 2 km of the c concentrations could po following completion of of plumes are also likely to cable trench/HDD pit at mg/l are predicted; SSC levels within a few days activities. Most prey species are a sediment owing to frequi fluctuations in sediment background levels of su already (Guillou, <i>et al.</i> , 2 During operation, within that there is no pathway of the cable crossing. Outside of Langstone H permanent loss of fish, s of cable non-burial prote affect prey availability si spatial extent (c.0.67 km Given that an indicative
					that there is no pathway of the cable crossing. Outside of Langstone H permanent loss of fish, s of cable non-burial prote affect prey availability si spatial extent (c.0.67 km
					considered that potential predicted during constru- As such, the potential for resulting from seabed du from the Proposed Deve significant and therefore in any adverse effects of Potential effects resulting temporal and spatial over



Marine Cable Corridor, where foraging may be lower (Wilson et al., 2014), the tat for route preparation is anticipated to km<sup>2</sup> along the entire Marine Cable ling common tern are not expected to be in high densities, given their meannge (15.2 km ± 11.2 km; Thaxter et al., rshore area (KP 0 – 21), It is predicted to 200 mg/l may be observed locally cable trench/HDD pit) and these potentially persist for several hours of construction activities. Sediment to be transported up to 5 km from the at which point concentrations of 5 to 10 SC is expected to return to background s following completion of these

able to tolerate a degree of suspended quent exposure to storm induced nt concentrations, together with high suspended sediment in the Solent ., 2017).

in Langstone Harbour, it is considered ay for impact due to the onshore nature

Harbour during operation, the h, shellfish and benthic habitat as a result btection is not predicted to significantly since these measures will be limited in km<sup>2</sup>).

ve worst-case failure rate of the Marine one repair every 10-12 years, it is tial increases in SSC would be less than truction and therefore not significant.

for effect from reduced prey availability disturbance/loss and increased turbidity evelopment alone is not predicted to be re, it is considered that it will not result on site integrity.

ing from plans or projects which have overlap with the Proposed Development 3) are considered to be highly localised

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					As such, it is concluded to site integrity from effects combination with other p PINS matrices for further
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Common terns are visual by an increase in turbidity prey. They are considered habitat disturbance (Brack associated with construct have the potential to reled during cable burial and a However, since HDD will with an onshore exit point is considered to be negling Outside of Langstone Hap pits (KP 1.0-1.6), and call the liberation and dispers and 15, and in other isola sediments up to 10 km fr highly likely that SSC at the and therefore not discern ranges from approximate Effects on prey species a considered to be significat increases in SSC will be small in extent. Elsewhere within the Mal common tern densities m area of disturbed habitat be a maximum of 3.6 km Corridor (c.6%). Breeding present beyond KP 21 in maximum foraging range 2012). Within this nearsh that a peak SSC of up to (i.e. within 2 km of the cal concentrations could pote following completion of c
					plumes are also likely to cable trench/HDD pit at v mg/l are predicted; SSC levels within a few days f activities.



d that there are no adverse effects on ts on prey availability, either alone or in project and plans (see Appendix 1 er details).

ual foragers and are likely to be affected dity which can make it harder to see ered to be moderately sensitive to radbury *et al.*, 2014). Activities uction, repair and maintenance works elease sediment inot the water column associated works.

vill be used within Langstone Harbour, bint, the volume of suspended material gligible.

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest a from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which ately <5 to 75 mg/l in coastal areas. s at the Landfall are therefore not icant since both habitat disturbance and be temporary, short in duration and

larine Cable Corridor, where foraging may be lower (Wilson et al., 2014), the at for route preparation is anticipated to m<sup>2</sup> along the entire Marine Cable ing common tern are not expected to be in high densities, given their meange (15.2 km ± 11.2 km; Thaxter et al., shore area (KP 0 - 21), it is predicted to 200 mg/l may be observed locally cable trench/HDD pit) and these otentially persist for several hours construction activities. Sediment to be transported up to 5 km from the which point concentrations of 5 to 10 C is expected to return to background following completion of these

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					During operation. an ind Marine Cables would re- is considered that poten than predicted during ca- significant. As such, the potential for resulting from increased Development alone is no therefore, it is considered effects on site integrity. Potential effects resulting temporal and spatial ov (Table 4 of Appendix 3) and temporary. As such, it is predicted site integrity from effects column, either alone or plans (see Appendix 1)
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemic during all development directly affect common industrial or user plastic has the potential to caus ingestion or entangleme However, routine mitiga practice in terms of was measures and strict nav likelihood of these even therefore it is predicted measures, there will be integrity. Given the scale and nat projects and the require measures which could of predicted that there will combination with other
Supporting habitat (water column)	Maintaining or restoring the extent, distribution, structure, function and supporting processes of the habitats of the qualifying features	Indirect effects	Supporting habitat: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\ge$ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	DO levels affect the con habitats. High turbidity of warmer months. Low DO impacts on key prey spe adversely affect the ava feature feeding habitat. repair and maintenance



ndicative worst-case failure rate of the require one repair every 10-12 years, it ential increases in SSC would be less construction and therefore not

for effects from reduced prey availability ed turbidity from the Proposed not predicted to be significant and red that it will not result in any adverse

ing from plans or projects which have overlap with the Proposed Development 3) are considered to be highly localised

d that there will be no adverse effects on cts on prey species within the water or in combination with other project and I PINS matrices for further details).

nical spillages from vessels may occur t phases. Spills have the potential to n terns utilising the sea surface through n mortality. Unplanned disposal of tic during all development phases also nuse common tern mortality through nent.

gation measures of standard best aste management, pollution prevention avigational protocols will make the ents occurring highly unlikely and d that, in consideration of mitigation be no significant adverse effects on site

ature of other potential plans and rement to adhere to similar best practice I contribute to in combination effects, it is ill be no adverse effect on site integrity in r plans and projects.

ondition and health of supporting v can lead to a drop in DO, especially in DO can have sub-lethal and lethal pecies (Best *et al.*, 2007) and hence can vailability and suitability of qualifying t. Activities associated with construction,

e works have the potential to release

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					sediment and increase
					associated works. How
					Langstone Harbour, wit
					suspended material is o
					Outside of Langstone H
					pits (KP 1.0-1.6), and c
					the liberation and dispe
					and 15, and in other isc sediments up to 10 km
					highly likely that SSC a
					and therefore not disce
					ranges from approxima
					Elsewhere within the M
					disturbed habitat for rou
					maximum of 3.6 km <sup>2</sup> al
					(c.6%). It is predicted the
					be observed locally (i.e.
					pit) and these concentra
					several hours following
					Sediment plumes are a from the cable trench/H
					5 to 10 mg/l are predict
					background levels withi
					these activities.
					During operation, given
					rate of the Marine Cabl
					12 years, it is considered
					would be less than prec
					not significant.
					As such, the potential for
					water column resulting
					Development alone is n
					therefore, it is considered
					effects on site integrity.
					Potential effects resulting
					temporal and spatial ov
					(Table 4 of Appendix 3)
					and temporary.
					As such, it is considered
					on site integrity from eff
					DO, either alone or in c
					(see Appendix 1 PINS r



e turbidity during cable installation and vever, since HDD will be used within ith an onshore exit point, the volume of considered to be negligible.

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest a from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which ately <5 to 75 mg/l in coastal areas.

Arine Cable Corridor, the area of oute preparation is anticipated to be a long the entire Marine Cable Corridor hat a peak SSC of up to 200 mg/l may e. within 2 km of the cable trench/HDD rations could potentially persist for g completion of construction activities. also likely to be transported up to 5 km HDD pit at which point concentrations of ted; SSC is expected to return to in a few days following completion of

n that an indicative worst-case failure les would require one repair every 10ed that potential increases in SSC dicted during construction and therefore

for effect on key prey species within the from a drop in DO from the Proposed not predicted to be significant and red that it will not result in any adverse

ng from plans or projects which have verlap with the Proposed Development ) are considered to be highly localised

ed that there will be no adverse effects ffects on prey availability from a drop in combination with other project and plans matrices for further details).

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute Supporting habitat: water quality - turbidity	Target Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Assessment A prolonged increase in has a number of potential water column, such as a filtering organs of suspen adversely affect the avail feature feeding habitat. A repair and maintenance sediment and increase the associated works. However, since HDD will with an onshore exit point is considered to be neglind Outside of Langstone Has pits (KP 1.0-1.6), and can the liberation and disper- and 15, and in other isolds sediments up to 10 km find highly likely that SSC at and therefore not discernarian ranges from approximate Effects on prey species a considered to be significant. Elsewhere within the Mas disturbed habitat for routtor maximum of 3.6 km <sup>2</sup> along (c.6%). It is predicted that be observed locally (i.e., pit) and these concentrator several hours following of Sediment plumes are als from the cable trench/HE 5 to 10 mg/l are predicted background levels withing these activities. During operation, an ind Marine Cables would recent is considered that potential for than predicted during con- significant. As such, the potential for the Proposed Developm significant and therefore,



n turbidity through sediment release tial implications for prey species in the affecting fish health and clogging the ension feeding animals. This in turn can ailability and suitability of qualifying . Activities associated with construction, e works have the potential to release turbidity during cable installation and

vill be used within Langstone Harbour, bint, the volume of suspended material gligible.

Harbour, excavation at the marine HDD cable installation (due to the potential for ersal of fines identified between KP 5 olated locations) will transport the finest a from the release point. However, it is at these distances will be low (< 5 mg/l) ernible above natural variation, which ately <5 to 75 mg/l in coastal areas. s at the Landfall are therefore not icant since both habitat disturbance and be temporary, short in duration and

Marine Cable Corridor, the area of ute preparation is anticipated to be a long the entire Marine Cable Corridor hat a peak SSC of up to 200 mg/l may e. within 2 km of the cable trench/HDD rations could potentially persist for completion of construction activities. also likely to be transported up to 5 km HDD pit at which point concentrations of ted; SSC is expected to return to in a few days following completion of

idicative worst-case failure rate of the equire one repair every 10-12 years, it initial increases in SSC would be less construction and therefore not

for effect from increased turbidity from ment alone is not predicted to be e, it is considered that it will not result on site integrity.

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Potential effects resulting temporal and spatial over (Table 4 of Appendix 3) and temporary. As such, it is considered on site integrity from effect or in combination with or PINS matrices for furthe
		Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemic during all development p directly affect prey spec range of biological effec user plastic during all de potential to affect prey s entanglement.
					However, routine mitigal practice in terms of was measures and strict nav likelihood of these event therefore it is predicted measures, there will be integrity from the Propse
					Given the scale and nat projects and the require measures which could of predicted that there will combination with other

Conclusion: No significant adverse effect on site integrity can be concluded, either from the Proposed Development alone, or in combination with other plans or projects, for the Chichester and Langstone Harbours SPA/Ramsar site.

Table 10.6- Assessment of potential adverse effects on site integrity for the Chichester and Langstone Harbours SPA/Ramsar site across all phases of the Proposed Development both alone and in combination with other plans or projects - onshore environment

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Sandwich tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex V of the Water Framework Directive, avoiding deterioration from existing levels.	Unplanned oil or chem the construction and o the potential to directly SPA and other suppor Unplanned disposal or construction and deco cause Sandwich tern entanglement. However, routine mitig practice in terms of wa measures (see Chapte



ng from plans or projects which have verlap with the Proposed Development ) are considered to be highly localised

ed that there will be no adverse effects ffects of increased turbidity, either alone other project and plans (see Appendix 1 er details).

ical spillages from vessels may occur phases. Spills have the potential to cies within the water column through a cts. Unplanned disposal of industrial or development phases also has the species through ingestion or

ation measures of standard best ste management, pollution prevention vigational protocols will make the nts occurring highly unlikely and that, in consideration of mitigation e no significant adverse effects on site soed Development alone.

ature of other potential plans and ement to adhere to similar best practice contribute to in combination effects, it is be no adverse effect on site integrity in plans and projects.

mical spillages from may occur during decommissioning phases. Spills have tly affect Sandwich tern utilising the orting habitats resulting in mortality. of industrial or user plastic during commissioning also has the potential to mortality through ingestion or

tigation measures of standard best waste management, pollution prevention oter 27: Waste and Material sources of

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					the ES) will make the highly unlikely and the Measures detailed in ( Onshore Outline Cons Plan ('CEMP') and de Management Plan ('M Plan ('SWMP') by the matters of the SWMP
					<ul> <li>Identify the produced potential for</li> </ul>
					<ul> <li>Identify po- out;</li> </ul>
					<ul> <li>Identify op manageme</li> </ul>
					<ul> <li>Identify the increase reader</li> </ul>
					<ul> <li>Identify su and record transfer no notes; and</li> </ul>
					<ul> <li>Consider a materials with that will be operative recycling.</li> </ul>
					Best practice recomm contamination will be CEMP or equivalent, a consultees prior to con Measures detail in Ch captured in the Onsho
					<ul> <li>Designated materials,</li> <li>On-site avaincluding a for use in t</li> </ul>



e likelihood of these events occurring herefore not significantly adverse. In Chapter 27 are summarised in the Instruction Environmental Management letail incorporating a Materials MMP') and Site Waste Management e contractor, once appointed. The key P are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory ommencement of construction works. Chapter 19: Groundwater and further nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals.;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Use of dri</li> </ul>
					Drain so
					watercours
					Therefore, no in comb
Little tern	Maintaining or restoring the	Accidental	Supporting	Restrict aqueous contaminants to levels	Unplanned oil or cher
	populations of qualifying features, and the distribution of qualifying features within the site.	spills and Litter	habitat: water quality - contaminants	equating to High Status according to Annex VIII and Good Status according to Annex V of the Water Framework Directive, avoiding deterioration from existing levels.	the construction and the potential to directl other supporting habi disposal of industrial decommissioning also mortality through inge routine mitigation mea terms of waste manag (see Chapter 27: Was make the likelihood o and therefore not sign Chapter 27 are summ and detail incorporatin ('MMP') and Site Was
					contractor, once appo are to:
					<ul> <li>Identify th produced potential f</li> </ul>
					<ul> <li>Identify po out;</li> </ul>
					<ul> <li>Identify op managem</li> </ul>
					<ul> <li>Identify t increase r</li> </ul>
					<ul> <li>Identify su and recor- transfer no notes; and</li> </ul>
					<ul> <li>Consider materials that will be operative recycling.</li> </ul>



rip trays under mobile plant; and

ocks to trap sediment entering the irse

hbination adverse effect is predicted. mical spillages from may occur during decommissioning phases. Spills have tly affect little tern utilising the SPA and bitats resulting in mortality. Unplanned or user plastic during construction and so has the potential to cause little tern estion or entanglement. However, easures of standard best practice in agement, pollution prevention measures aste and Material sources of the ES) will of these events occurring highly unlikely nificantly adverse. Measures detailed in marised in the Onshore Outline CEMP ing a Materials Management Plan aste Management Plan ('SWMP') by the pointed. The key matters of the SWMP

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and .

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Best practice recomm contamination will be CEMP or equivalent, consultees prior to co Measures detail in Ch captured in the Onsho
					<ul> <li>Designate materials,</li> </ul>
					On-site av including a for use in t
					Use of drip
					Drain so watercours
Common tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex V of the Water Framework Directive, avoiding deterioration from existing levels.	Therefore, no in comb Unplanned oil or cher the construction and of the potential to direct and other supporting Unplanned disposal of construction and deco cause common term in entanglement. However standard best practice pollution prevention in Material sources of the events occurring high significantly adverse. summarised in the Or incorporating a Material Site Waste Management once appointed. The
					produced potential f
					<ul> <li>Identify po out;</li> </ul>
					<ul> <li>Identify op managem</li> </ul>



mendations for the prevention of be outlined in more detail in a Final t, and agreed with relevant statutory commencement of construction works. Chapter 19: Groundwater and further hore Outline CEMP include:

tted areas for the storage of hazardous s, fuels and chemicals.;

availability of oil spill clean-up equipment g absorbent material and inflatable booms n the event of an oil spill or leak;

trip trays under mobile plant; and

socks to trap sediment entering the urse

nbination adverse effect is predicted. emical spillages from may occur during decommissioning phases. Spills have tly affect common tern utilising the SPA habitats resulting in mortality. of industrial or user plastic during commissioning also has the potential to mortality through ingestion or ever, routine mitigation measures of ce in terms of waste management, measures (see Chapter 27: Waste and the ES) will make the likelihood of these ship unlikely and therefore not . Measures detailed in Chapter 27 are Onshore Outline CEMP and detail erials Management Plan ('MMP') and ment Plan ('SWMP') by the contractor, key matters of the SWMP are to:

the volume of waste streams likely to be d during the works to establish the l for reuse and recycling;

possible options for waste to be 'designed

opportunities for waste minimisation and ment;

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Identify the increase relation of the increase relation of</li></ul>
					<ul> <li>Best practice recomm contamination will be CEMP or equivalent, consultees prior to co Measures detail in Ch captured in the Onsho</li> <li>Designate materials,</li> <li>On-site av including a for use in</li> <li>Use of dri</li> <li>Drain so watercourt</li> </ul>
Dark-bellied brent goose	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	<ul> <li>Therefore, no in comb</li> <li>Dark-bellied brent god sensitivity to disturban presence of construction</li> <li>Langstone Harbour in works in and adjacent</li> <li>dark-bellied brent ged components of their di 2018).</li> <li>Owens (1977) describe</li> <li>disturbances on Brent</li> <li>near the site of the the</li> <li>Sands. The report combecame habituated to</li> </ul>



the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

r appropriate site practices such as how s will be segregated and the measures be used for raising awareness among site e for waste reduction, reuse and .

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory ommencement of construction works. Chapter 19: Groundwater and further nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals.;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the irse

nbination adverse effect is predicted. oose is considered to be of high ance (Cutts et al., 2013). Therefore, the ction associated with HDD works in in addition to Onshore Cable Route nt to SWBGS sites around may disturb eese at both roosting and foraging daily cycle (SWBGS Steering Group,

ribes the effects of anthropogenic nt Geese wintering on the Essex coast hen proposed London Airport at Maplin oncluded that Brent Geese quickly to most sounds, but unexpected

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					sounds, such as near
					put the geese to flight
					nearby army gunnery
					area, but they quickly firings for that day. Ex
					during nearby weapon
					first few weeks.
					Specific surveys for the
					in both intertidal and
					Appendix 16.13). Fur
					areas to the Propose decommissioning wo
					brent goose from favo
					through unpredictable
					Development is within
					stage work within the
					availability grassland
					overlaps with the win geese and other wint
					of the SPA are prese
					(Carboneras et al. 20
					would produce direct
					movements of constr
					restricting the availab
					sites as foraging area with onshore compon
					• P25 – L
					Campus;
					• P23B – U
					• P23A – M
					• P23R – M
					• P11 – Ker
					• P08A – Fa
					Effects of the construct
					Langstone Harbour S
					community will be ave
					when SPA birds such
					when SPA birds such from their breeding gr
					Details of the working
					Onshore Ecology and



arby gunshots from wildfowlers, usually nt. Similarly, the first shots of the day at y ranges caused the birds to leave the y returned and ignored all subsequent Extremely loud but regular bangs made on testing caused little reaction after the

this species recorded notable numbers terrestrial areas of the Study Area (ES rthermore, given the proximity of these ed Development, construction and orks may displace wintering dark-bellied oured foraging and roosting habitat le noise events. However, the Proposed in an industrialised setting. Construction SWBGS sites will reduce the foraging habitat where the stage nter season when dark-bellied brent tering birds that are qualifying features ent, nominally October to March 019). Work within the sites during winter disturbance of the sites from noise and ruction vehicles and machinery, further bility of remaining grassland within the as. The following SWBGS sites overlap nents of the Proposed Development:

University of Portsmouth, Langstone

- Jniversity of Portsmouth;
- Vilton Common north 1;
- Vilton Common north 2;
- endall's Wharf playing fields; and
- Farlington playing fields.

uction stage on Chichester and SPA and it's wintering intertidal bird voided by restricting works within the ed as October to March (the period h as dark-bellied brent goose arrive grounds (Snow and Perrins, 1998). g restriction are provided in Chapter 16: id Appendix 16.14: Winter Working

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Restriction for Feature Harbours SPA, and co incorporated into work avpoid effects on dark
					<ul> <li>Principle 1 in SWBGS primary or Proposed October – park within movements no function waterbirds Langstone</li> </ul>
					<ul> <li>Principle 4 that are ov in any rest</li> </ul>
					Principle 5     can occur
					Principle 6     LAeq imme adjacent to existing no is consider Developme instances.
					<ul> <li>Principle 7         <ul> <li>(&gt;70dB LA noise 60-7             <ul></ul></li></ul></li></ul>
					<ul> <li>Principle &amp; LAeq) that restricted of HDD 2 and</li> </ul>



res of Chichester & Langstone comprise eight principles that will be rking methods. Those relevant to rk-bellied brent goose include:

1: Construction works cannot take place GS (those categorised as either core, or secondary) sites that overlap with the d Developments Order Limits during – March. An exception is the gravel car hin site P11 that is already disturbed by nts of cars, lorries and plant, and offers ional habitat for brent geese or other ds associated with Chichester and he Harbour SPA.

4: Elements of the Onshore Cable Route over 400 m from the SPA are not included striction.

5: Construction noise events of <55 dB ir unrestricted.

6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or to industrial sites with notable levels of noise can be undertaken unrestricted. It ered that noise levels from the Proposed ment would be masked in these s.

7: Regular/consistent construction noise LAeq) and irregular/sudden construction -72 dB LAeq implies potential for impacts nore sensitive species e.g. dark-bellied ese and can only occur if effects do not with areas of the SPA identified as ng this species.

8: Irregular construction noise (>70dB nat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature                 Image: Descent region of the sector of	Conservation Objectives	Effect         Accidental spills and Litter	Attribute         Supporting habitat: food availability	Target         Maintain the distribution, abundance and availability of key food and prey items e.g.         Zostera, Ulva spp., Spergularia, Puccinellia, Triglochin, Aster trifolium, Plantago, Salicornia spp, Agrostis stolonifera, Lolium perenne, Trifolium repens) at preferred sizes.	Assessmentwintering the arrivalAdoption of these printSWBGS sites (as thethe winter period wheeffects of noise and viceAdditionally, principleswith HDD sites 2 andwhere dark-bellied brownWill not disturb them.Therefore, potential dataare not likely to be signedeffects are predicted foris no contribution to indisplacement.Unplanned oil or chertthe construction and ofthe potential to directlingutilising intertidal andmortality. Unplannedduring construction andduring construction andthe potential to causethrough ingestion or emitigation measures ofwaste management, producedChapter 27: Waste arrmake the likelihood orand detail incorporating('MMP') and Site Wastecontractor, once apportare to:Identify theproducedpotential forutility theproducedpotential forutil potential for



period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects on ese sites will not be subject to works in en they are used by SPA birds), and vibration on birds within the SPA itself. es mandate that vibropiling associated d 3 will not take place during the period rent geese are present, and therefore

disturbance and displacement effects ignificantly adverse. As no significant I for the Proposed Development, there in combination disturbance and

mical spillages from may occur during decommissioning phases. Spills have tly affect dark-bellied brent geese other supporting habitats resulting in disposal of industrial or user plastic and decommissioning phases also has e dark-bellied brent goose mortality entanglement. However, routine of standard best practice in terms of pollution prevention measures (see and Material sources of the ES) will of these events occurring highly unlikely nificantly adverse. Measures detailed in marised in the Onshore Outline CEMP ing a Materials Management Plan aste Management Plan ('SWMP') by the pointed. The key matters of the SWMP

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Identify the increase residentiation increase residentiation increase residentiation increase records and records transfer not an increase records and records transfer not notes; and</li> <li>Consider a materials that will be operative recycling.</li> <li>Best practice recomm contamination will be CEMP or equivalent, a consultees prior to co Measures detail in Chacaptured in the Onshoton including a for use in the including a fo</li></ul>
					Therefore, no in comb
Redshank	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Redshank is consider disturbance (Cutts <i>et</i> construction associate Harbour may disturb r components of their d on a monthly basis in most during low tide s Furthermore, given the Proposed Developme works may displace w foraging and roosting events. However, the industrialised setting s



the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and .

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory ommencement of construction works. Chapter 19: Groundwater and further nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the rse

hbination adverse effect is predicted.

ered to be of high sensitivity to at al., 2013). Therefore, the presence of ated with HDD works in Langstone redshank at both roosting and foraging daily cycle. This species was recorded n intertidal areas of the Study Area, surveys (ES Appendix 16.13). the proximity of these areas to the ent, construction and decommissioning wintering redshank from favoured g habitat through unpredictable noise e Proposed Development is within an suggesting that any noise effects

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute	Target	<ul> <li>would not add signifi than where HDD rou do not coincide with the construction stag Harbour SPA and it's be avoided by restrict defined as October t such as redshank ar and Perrins, 1998). I provided in Chapter 16.14: Winter Workin &amp; Langstone Harbout that will be incorpora relevant to redshank only during surveys f Principles 4 – 8:</li> <li>Principle that are of in any res</li> <li>Principle can occu</li> <li>Principle LAeq imr adjacent existing r is conside</li> </ul>
					<ul> <li>Principle can occu</li> <li>Principle LAeq im adjacent existing is conside Develop</li> </ul>
					instances Principle (>70dB I noise 60 on the r brent ge overlap supportir
					<ul> <li>Principle LAeq) the restricted HDD 2 a</li> </ul>



ficantly to baseline conditions. Other utes underlie the SPA, the Order Limits in the SPA itself. Furthermore, effects of ge on Chichester and Langstone is wintering intertidal bird community will cting works within the winter season, to March (the period when SPA birds urrive from their breeding grounds (Snow Details of the working restriction are 16: Onshore Ecology and Appendix ing Restriction for features of Chichester urs SPA, and comprise eight principles ated into working methods. Those k which was recorded in intertidal habitat for the Proposed Development are

e 4: Elements of the Onshore Cable Route over 400 m from the SPA are not included estriction.

e 5: Construction noise events of <55 dB ur unrestricted.

e 6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or t to industrial sites with notable levels of noise can be undertaken unrestricted. It dered that noise levels from the Proposed ment would be masked in these s.

e 7: Regular/consistent construction noise LAeq) and irregular/sudden construction 0-72 dB LAeq implies potential for impacts more sensitive species e.g. dark-bellied eese and can only occur if effects do not with areas of the SPA identified as ng this species.

e 8: Irregular construction noise (>70dB hat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					wintering p the arrival Adoption of these prin and vibration on birds principles mandate the sites 2 and 3 will not t redshank are present not disturb them. Therefore, potential d are not likely significa are predicted for the F contribution to in com
		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g earthworm, leatherjacket, grassland/marsh invertebrates, <i>Hydrobia, Macoma, Corophium,</i> <i>Nereis</i> ) at preferred sizes.	displacement. Unplanned oil or chem the construction and of the potential to directly and other supporting Unplanned disposal of construction and deco potential to cause red entanglement. However standard best practices pollution prevention m Material sources of the events occurring high significantly adverse. summarised in the Or incorporating a Material Site Waste Managem once appointed. The for potential for uncential for bildentify the potential for ldentify potential for
					out; • Identify op managem
					<ul> <li>Identify the increase relation</li> </ul>
					<ul> <li>Identify su and record</li> </ul>



period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise Is within the SPA. Additionally, the hat vibropiling associated with HDD take place during the period where to in notable numbers, and therefore will

disturbance and displacement effects antly adverse. As no significant effects Proposed Development, there is no mbination disturbance and

mical spillages from may occur during decommissioning phases. Spills have tly affect redshank utilising intertidal habitats resulting in mortality. of industrial or user plastic during commissioning phases also has the dshank mortality through ingestion or ever, routine mitigation measures of ce in terms of waste management, measures (see Chapter 27: Waste and the ES) will make the likelihood of these hly unlikely and therefore not Measures detailed in Chapter 27 are Onshore Outline CEMP and detail rials Management Plan ('MMP') and ment Plan ('SWMP') by the contractor, key matters of the SWMP are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					transfer no notes; and Consider a materials that will be operative recycling. Best practice recomm contamination will be CEMP or equivalent, a consultees prior to co Measures detail in Ch captured in the Onsho Designate materials, On-site av including a for use in t Use of drip Drain soo watercours
Shelduck	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Shelduck is considered disturbance (Cutts <i>et a</i> construction associated Harbour may disturb as components of their d on a monthly basis in highest numbers reco (ES Appendix 16.13). the Proposed Develop decommissioning wor from favoured foraging unpredictable noise effects Development is within that the noise effects conditions. Other that the Order Limits do no Furthermore, effects of and Langstone Harbo



notes and hazardous waste consignment

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory ommencement of construction works. Chapter 19: Groundwater and further hore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals.;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the rse

hbination adverse effect is predicted.

red to be of high sensitivity to t al., 2013). Therefore, the presence of ated with HDD works in Langstone shelduck at both roosting and foraging daily cycle. This species was recorded n intertidal areas of the Study Area, with corded at low tide (up to 66 individuals) ). Given the proximity of these areas to opment, construction and orks may displace wintering shelduck ng and roosting habitat through events. However, the Proposed in an industrialised setting suggesting would not add significantly to baseline an where HDD routes underlie the SPA, not coincide with the SPA itself.

of the construction stage on Chichester our SPA and it's wintering intertidal bird

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					community will be ave winter season, define when SPA birds such grounds (Snow and F restriction are provide Appendix 16.14: Wint Chichester & Langsto principles that will be Those relevant to she habitat only during su are Principles 4 – 8:
					<ul> <li>Principle 4 that are ov in any res</li> </ul>
					Principle 5     can occur
					<ul> <li>Principle</li> <li>LAeq imm adjacent t existing no is conside</li> <li>Developm instances.</li> </ul>
					<ul> <li>Principle 7 (&gt;70dB L/ noise 60-7 on the mo can only c of the SP/</li> </ul>
					<ul> <li>Principle LAeq) that restricted HDD 2 art wintering the arrival</li> </ul>
					Adoption of these prin and vibration on birds principles mandate th sites 2 and 3 will not



voided by restricting works within the ned as October to March (the period ch as shelduck arrive from their breeding Perrins, 1998). Details of the working ded in Chapter 16: Onshore Ecology and inter Working Restriction for Features of tone Harbours SPA, and comprise eight the incorporated into working methods. helduck which was recorded in intertidal surveys for the Proposed Development

e 4: Elements of the Onshore Cable Route over 400 m from the SPA are not included estriction.

5: Construction noise events of <55 dB ir unrestricted.

e 6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or t to industrial sites with notable levels of noise can be undertaken unrestricted. It dered that noise levels from the Proposed ment would be masked in these s.

e 7: Regular/consistent construction noise LAeq) and irregular/sudden construction 0-72 dB LAeq implies potential for impacts nore sensitive species e.g. shelduck and occur if effects do not overlap with areas PA identified as supporting this species.

e 8: Irregular construction noise (>70dB hat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the g period, with sheet piles inserted prior to ral of wintering SPA birds.

tion of these principles will offset direct effects of noise vibration on birds within the SPA. Additionally, the iples mandate that vibropiling associated with HDD 2 and 3 will not take place during the period where

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Image: Supporting pills and Litter       Accidental spills and Litter       Supporting habitat: -costal       Maintain the distribution, abundance and prey items e.g.       Image: Supporting habitat: -costal	shelduck are present i not disturb them. Therefore, potential di are not likely significar are predicted for the F contribution to in comb displacement. Unplanned oil or chem the construction and c the potential to directly
spills and Litter habitat: -costal availability of key food and prey items e.g. th	the construction and c the potential to directly
availability at preferred sizes.	other supporting habit disposal of industrial of decommissioning pha- shelduck mortality thro However, routine mitig practice in terms of wa measures (see Chapte the ES) will make the highly unlikely and the Measures detailed in ( Onshore Outline CEM Management Plan ('M Plan ('SWMP') by the matters of the SWMP • Identify the produced potential fo • Identify por out; • Identify op manageme • Identify op manageme • Identify the increase re • Identify su and record transfer no notes; and • Consider a materials



t in notable numbers, and therefore will

disturbance and displacement effects antly adverse. As no significant effects Proposed Development, there is no mbination disturbance and

mical spillages from may occur during decommissioning phases. Spills have tly affect shelduck utilising intertidal and bitats resulting in mortality. Unplanned or user plastic during construction and hases also has the potential to cause rough ingestion or entanglement. tigation measures of standard best waste management, pollution prevention oter 27: Waste and Material sources of e likelihood of these events occurring nerefore not significantly adverse. Chapter 27 are summarised in the MP and detail incorporating a Materials MMP') and Site Waste Management e contractor, once appointed. The key P are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					<ul> <li>operative for waste reduction, reuse and recycling.</li> <li>Best practice recommendations for the prevention of contamination will be outlined in more detail in a Final CEMP or equivalent, and agreed with relevant statutory consultees prior to commencement of construction works. Measures detail in Chapter 19: Groundwater and further captured in the Onshore Outline CEMP include: <ul> <li>Designated areas for the storage of hazardous materials, fuels and chemicals;</li> <li>On-site availability of oil spill clean-up equipment including absorbent material and inflatable booms for use in the event of an oil spill or leak;</li> <li>Use of drip trays under mobile plant; and</li> <li>Drain socks to trap sediment entering the watercourse.</li> </ul> </li> </ul>
Pintail	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Pintail is considered to be of moderate sensitivity to disturbance. Therefore, the presence of construction associated with HDD works in Langstone Harbour may disturb pintail at both roosting and foraging components of their daily cycle. This species was recorded on a on most low tide surveys in intertidal areas of the Study Area with up to 75 individuals noted (ES Appendix 16.13). Given the proximity of these areas to the Proposed Development, construction and decommissioning works may displace wintering shelduck from favoured foraging and roosting habitat through unpredictable noise events. However, the Proposed Development is within an industrialised setting suggesting that the noise effects would not add significantly to baseline conditions. Other than where HDD routes underlie the SPA, the Order Limits do not coincide with the SPA itself. Furthermore, effects of the construction stage on Chichester and Langstone Harbour SPA and it's wintering intertidal bird community will be avoided by restricting works within the winter season, defined as October to March (the period when SPA birds such as pintail arrive from their breeding grounds (Snow and Perrins, 1998). Details of the working restriction are provided in Chapter 16: Onshore Ecology and Appendix 16.14: Winter Working Restriction for Features of Chichester & Langstone Harbour SPA, and



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Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					comprise eight princip working methods. The recorded in intertidal h Proposed Developme
					<ul> <li>Principle 4 that are ov in any rest</li> </ul>
					Principle 5     can occur
					<ul> <li>Principle</li> <li>LAeq imm adjacent t existing no is conside</li> <li>Developm instances.</li> </ul>
					<ul> <li>Principle 7         <ul> <li>(&gt;70dB L/ noise 60-7             <ul></ul></li></ul></li></ul>
					<ul> <li>Principle</li> <li>LAeq) that restricted</li> <li>HDD 2 are wintering</li> <li>the arrival</li> </ul>
					Adoption of these prin and vibration on birds principles mandate th sites 2 and 3 will not t pintail are present in disturb them.
					Therefore, potential d are not likely significa are predicted for the f contribution to in com displacement.



iples that will be incorporated into nose relevant to pintail which was habitat only during surveys for the ent are Principles 4 – 8:

4: Elements of the Onshore Cable Route over 400 m from the SPA are not included striction.

5: Construction noise events of <55 dB ir unrestricted.

6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or to industrial sites with notable levels of noise can be undertaken unrestricted. It ered that noise levels from the Proposed ment would be masked in these s.

7: Regular/consistent construction noise \_Aeq) and irregular/sudden construction -72 dB LAeq implies potential for impacts ore sensitive species e.g. pintail and can ur if effects do not overlap with areas of identified as supporting this species.

8: Irregular construction noise (>70dB nat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise Is within the SPA. Additionally, the hat vibropiling associated with HDD take place during the period where notable numbers, and therefore will not

disturbance and displacement effects antly adverse. As no significant effects Proposed Development, there is no mbination disturbance and

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
<u>r eature</u>		Accidental spills and Litter	Supporting habitat: –food availability	Maintain the distribution, abundance and availability of key food and prey items e.g Eleocharis palustris, Potamogeton, Elodea, Rumex, Glyceria, Chara, hatching midges, insects, molluscs, crustaceans, Hydrobia, cereal grains and potatoes) at preferred sizes.	<ul> <li>Assessment</li> <li>Unplanned oil or cher the construction and of other supporting habit disposal of industrial of decommissioning pha- pintail mortality throug However, routine miti- practice in terms of we measures (see Chapt the ES) will make the highly unlikely and the Measures detailed in Onshore Outline CEM Management Plan ('M Plan ('SWMP') by the matters of the SWMP</li> <li>Identify the produced potential f</li> <li>Identify op managem</li> <li>Identify op managem</li> <li>Identify op managem</li> <li>Identify su and recor transfer no notes; and</li> <li>Consider materials that will be operative recycling.</li> </ul>



emical spillages from may occur during decommissioning phases. Spills have ctly affect pintail utilising intertidal and bitats resulting in mortality. Unplanned or user plastic during construction and hases also has the potential to cause ugh ingestion or entanglement. itigation measures of standard best waste management, pollution prevention pter 27: Waste and Material sources of ne likelihood of these events occurring herefore not significantly adverse. n Chapter 27 are summarised in the MP and detail incorporating a Materials 'MMP') and Site Waste Management ne contractor, once appointed. The key IP are to:

the volume of waste streams likely to be d during the works to establish the I for reuse and recycling;

possible options for waste to be 'designed

opportunities for waste minimisation and ment;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

er appropriate site practices such as how s will be segregated and the measures be used for raising awareness among site e for waste reduction, reuse and g.

mendations for the prevention of be outlined in more detail in a Final t, and agreed with relevant statutory commencement of construction works.

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					Measures detail in Cl captured in the Onshe Designate materials, On-site av including for use in Use of dri Drain so watercour Therefore, no in com
Shoveler	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Shoveler is considered disturbance. Therefore associated with HDD disturb shoveler at boo of their daily cycle. The single low tide survey Area with 2 individual the proximity of these construction and decount wintering shoveler from unpredictable noise of very small numbers at Development is within that the noise effects conditions. Other than where HD Limits do not coincide effects of the construct Langstone Harbour St community will be ave winter season, define when SPA birds such grounds (Snow and F restriction are provide Appendix 16.14: Wint Chichester & Langston principles that will be Those relevant to sho habitat only during su



Chapter 19: Groundwater and further nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the rse

hbination adverse effect is predicted.

red to be of moderate sensitivity to ore, the presence of construction D works in Langstone Harbour may ooth roosting and foraging components This species was recorded on a on a ey only in intertidal areas of the Study als noted (ES Appendix 16.13). Given se areas to the Proposed Development, commissioning works may displace rom favoured habitat through events, although it is evident that only are present. The Proposed hin an industrialised setting suggesting s would not add significantly to baseline

DD routes underlie the SPA, the Order de with the SPA itself. Furthermore, uction stage on Chichester and SPA and it's wintering intertidal bird voided by restricting works within the ned as October to March (the period ch as shoveler arrive from their breeding Perrins, 1998). Details of the working ded in Chapter 16: Onshore Ecology and nter Working Restriction for Features of tone Harbours SPA, and comprise eight e incorporated into working methods. noveler which was recorded in intertidal surveys for the Proposed Development

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					<ul> <li>Principle 4 that are ov in any rest</li> </ul>
					Principle 5     can occur
					<ul> <li>Principle 6 LAeq imme adjacent to existing no is consider Developme instances.</li> </ul>
					<ul> <li>Principle 7 (&gt;70dB LA noise 60-7 on the mo can only o of the SPA</li> </ul>
					<ul> <li>Principle &amp; LAeq) that restricted of HDD 2 and wintering p the arrival</li> </ul>
					Adoption of these prin and vibration on birds principles mandate that sites 2 and 3 will not t shoveler are present in not disturb them.
					Therefore, potential di are not likely significat are predicted for the F contribution to in com displacement.
		Accidental spills and Litter	Supporting habitat: –food availability	Maintain the distribution, abundance and availability of key food and prey items e.g cirpus, Eleocharis, Carex, Potamogeton,	Unplanned oil or cheme the construction and construction and construction the potential to directly other supporting habit



4: Elements of the Onshore Cable Route over 400 m from the SPA are not included striction.

5: Construction noise events of <55 dB ir unrestricted.

6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or to industrial sites with notable levels of noise can be undertaken unrestricted. It ered that noise levels from the Proposed ment would be masked in these s.

7: Regular/consistent construction noise \_Aeq) and irregular/sudden construction -72 dB LAeq implies potential for impacts nore sensitive species e.g. shoveler and occur if effects do not overlap with areas PA identified as supporting this species.

8: Irregular construction noise (>70dB nat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise Is within the SPA. Additionally, the hat vibropiling associated with HDD take place during the period where t in notable numbers, and therefore will

disturbance and displacement effects antly adverse. As no significant effects Proposed Development, there is no mbination disturbance and

emical spillages from may occur during decommissioning phases. Spills have ty affect shoveler utilising intertidal and bitats resulting in mortality. Unplanned

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute           Image: Attrite           Image: Attrite <td>Target         Glyceria, surface plankton, hatching midges, Hydrobia, crustaceans, caddisflies, diptera, beetles) at preferred sizes.</td> <td>disposal of industrial decommissioning pha mortality through inger routine mitigation me terms of waste mana (see Chapter 27: Wa make the likelihood of and therefore not sig Chapter 27 are summ and detail incorporati ('MMP') and Site Wa contractor, once apper are to: Identify the produced potential the ldentify of managem Identify of managem Identify s and reconsider materials that will be operative recycling.</td>	Target         Glyceria, surface plankton, hatching midges, Hydrobia, crustaceans, caddisflies, diptera, beetles) at preferred sizes.	disposal of industrial decommissioning pha mortality through inger routine mitigation me terms of waste mana (see Chapter 27: Wa make the likelihood of and therefore not sig Chapter 27 are summ and detail incorporati ('MMP') and Site Wa contractor, once apper are to: Identify the produced potential the ldentify of managem Identify of managem Identify s and reconsider materials that will be operative recycling.
					Best practice recommon contamination will be CEMP or equivalent, consultees prior to co Measures detail in Cl captured in the Onshe
					<ul> <li>Design materia</li> </ul>



I or user plastic during construction and hases also has the potential to shoveler gestion or entanglement. However, easures of standard best practice in agement, pollution prevention measures aste and Material sources of the ES) will of these events occurring highly unlikely gnificantly adverse. Measures detailed in marised in the Onshore Outline CEMP ting a Materials Management Plan aste Management Plan ('SWMP') by the pointed. The key matters of the SWMP

the volume of waste streams likely to be d during the works to establish the for reuse and recycling;

possible options for waste to be 'designed

opportunities for waste minimisation and ment;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and .

amendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory commencement of construction works. Chapter 19: Groundwater and further hore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals.;

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					<ul> <li>On-site avaincluding a for use in t</li> <li>Use of drip</li> <li>Drain soo watercours</li> <li>Therefore, no in comb</li> </ul>
Teal	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Teal is considered to a disturbance. Therefore associated with HDD y disturb teal at both root their daily cycle. Given Proposed Development works may displace we through unpredictable that only very small nu Development is within that the noise effects we conditions. Other than where HDI Limits do not coincide effects of the construct Langstone Harbour SF community will be avo winter season, defined when SPA birds such grounds (Snow and Per restriction are provided Appendix 16.14: Winte Chichester & Langston principles that will be i Those relevant to teal • Principle 4 that are ow in any rest • Principle 5 can occur • Principle 6 LAeq imme



availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the rse

hbination adverse effect is predicted.

b be of moderate sensitivity to bre, the presence of construction O works in Langstone Harbour may costing and foraging components of en the proximity of these areas to the ment, construction and decommissioning wintering teal from favoured habitat le noise events, although it is evident numbers are present. The Proposed in an industrialised setting suggesting is would not add significantly to baseline

DD routes underlie the SPA, the Order le with the SPA itself. Furthermore, action stage on Chichester and SPA and it's wintering intertidal bird voided by restricting works within the ed as October to March (the period h as teal arrive from their breeding Perrins, 1998). Details of the working led in Chapter 16: Onshore Ecology and hter Working Restriction for Features of one Harbours SPA, and comprise eight e incorporated into working methods. al are Principles 4 – 8:

4: Elements of the Onshore Cable Route over 400 m from the SPA are not included striction.

5: Construction noise events of <55 dB ir unrestricted.

6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or

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Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					adjacent te existing no is conside Developm instances.
					<ul> <li>Principle 7 (&gt;70dB LA noise 60-7 on the mo only occur the SPA io</li> </ul>
					<ul> <li>Principle &amp; LAeq) that restricted HDD 2 and wintering p the arrival</li> </ul>
					Adoption of these prin and vibration on birds principles mandate the sites 2 and 3 will not t are present in notable disturb them.
					Therefore, potential d are not likely significal are predicted for the F contribution to in com displacement.
		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g <i>Salicornia, Atriplex</i> , cereal grains, <i>Polygonum</i> , <i>Eleocharis, Rumex, Ranunculus, Hydrobia</i> , flies, caddisfly, beetles, bugs, hatching midges) at preferred sizes.	Unplanned oil or chen the construction and of the potential to directly other supporting habit disposal of industrial of decommissioning pha teal mortality through routine mitigation mea terms of waste manage (see Chapter 27: Was make the likelihood of and therefore not sign Chapter 27 are summ



to industrial sites with notable levels of noise can be undertaken unrestricted. It ered that noise levels from the Proposed ment would be masked in these s.

7: Regular/consistent construction noise \_Aeq) and irregular/sudden construction -72 dB LAeq implies potential for impacts nore sensitive species e.g. teal and can ur if effects do not overlap with areas of identified as supporting this species.

8: Irregular construction noise (>70dB nat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise Is within the SPA. Additionally, the hat vibropiling associated with HDD take place during the period where teal le numbers, and therefore will not

disturbance and displacement effects antly adverse. As no significant effects Proposed Development, there is no mbination disturbance and

emical spillages from may occur during decommissioning phases. Spills have stly affect teal utilising intertidal and bitats resulting in mortality. Unplanned or user plastic during construction and hases also has the potential to cause in ingestion or entanglement. However, easures of standard best practice in agement, pollution prevention measures aste and Material sources of the ES) will of these events occurring highly unlikely gnificantly adverse. Measures detailed in marised in the Onshore Outline CEMP

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute         Image: Image	Target	<ul> <li>and detail incorporatin ('MMP') and Site Was contractor, once appor are to:</li> <li>Identify th produced potential f</li> <li>Identify pot out;</li> <li>Identify op managem</li> <li>Identify th increase r</li> <li>Identify st and recorn transfer not notes; and</li> <li>Consider materials that will be operative recycling.</li> <li>Best practice recomm contamination will be CEMP or equivalent,</li> </ul>
					materials that will be operative recycling. Best practice recomm contamination will be CEMP or equivalent, consultees prior to co Measures detail in Ch
					captured in the Onshe Designate materials,
					<ul> <li>On-site av including for use in</li> </ul>
					Use of dri
					<ul> <li>Drain so watercour</li> </ul>
					Therefore, no in comb



ting a Materials Management Plan aste Management Plan ('SWMP') by the pointed. The key matters of the SWMP

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and ment;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory commencement of construction works. Chapter 19: Groundwater and further

nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the Irse

hbination adverse effect is predicted.

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Wigeon	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Wigeon is considered disturbance. Therefore associated with HDD disturb wigeon. This si- intertidal areas of the Given the proximity of Development, constru- may displace wintering through unpredictable that at most, very sma Development is within that the noise effects conditions. Other that the Order Limits do no Furthermore, effects of and Langstone Harbo community will be avo winter season, define when SPA birds such grounds (Snow and P restriction are provide Appendix 16.14: Winte Chichester & Langsto principles that will be Those relevant to wig
					that are ov in any rest
					Principle 5 can occur
					<ul> <li>Principle 6 LAeq imme adjacent to existing no is consider Developme instances.</li> </ul>
					<ul> <li>Principle 7         <ul> <li>(&gt;70dB LA noise 60-7</li></ul></li></ul>



ed to be of moderate sensitivity to ore, the presence of construction D works in Langstone Harbour may species was however unrecorded in e Study Area (ES Appendix 16.13). of these areas to the Proposed ruction and decommissioning works ng wigeon from favoured habitat le noise events, although it is evident nall numbers are present. The Proposed in an industrialised setting suggesting s would not add significantly to baseline an where HDD routes underlie the SPA, not coincide with the SPA itself.

of the construction stage on Chichester our SPA and it's wintering intertidal bird voided by restricting works within the ed as October to March (the period h as shelduck arrive from their breeding Perrins, 1998). Details of the working led in Chapter 16: Onshore Ecology and nter Working Restriction for features of tone Harbours SPA, and comprise eight e incorporated into working methods. geon are Principles 4 – 8:

4: Elements of the Onshore Cable Route over 400 m from the SPA are not included striction.

5: Construction noise events of <55 dB ir unrestricted.

6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or to industrial sites with notable levels of noise can be undertaken unrestricted. It lered that noise levels from the Proposed ment would be masked in these s.

7: Regular/consistent construction noise \_Aeq) and irregular/sudden construction -72 dB LAeq implies potential for impacts nore sensitive species e.g. wigeon and

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute	Target	Assessment can only o of the SPA • Principle & LAeq) tha restricted HDD 2 an wintering p the arrival
					Adoption of these prin and vibration on birds principles mandate tha sites 2 and 3 will not t wigeon are present in not disturb themThere displacement effects a no significant effects a Development, there is disturbance and displa
		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g Zostera, Enteromorpha, Polygonum, Eleocharis, Rumex, Ranunculus, Agrostis stolonifera, Puccinellia maritima, Salicornia spp., hatching midges) at preferred sizes.	Unplanned oil or chen the construction and o the potential to directly other supporting habit disposal of industrial o decommissioning pha wigeon mortality throu However, routine mitig practice in terms of wa measures (see Chapt the ES) will make the highly unlikely and the Measures detailed in Onshore Outline CEM Management Plan ('M Plan ('SWMP') by the matters of the SWMP
					<ul> <li>Identify the produced potential for</li> </ul>
					<ul> <li>Identify po out;</li> </ul>



occur if effects do not overlap with areas PA identified as supporting this species.

8: Irregular construction noise (>70dB nat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise Is within the SPA. Additionally, the hat vibropiling associated with HDD take place during the period where in notable numbers, and therefore will refore, potential disturbance and s are not likely significantly adverse. As are predicted for the Proposed is no contribution to in combination placement.

mical spillages from may occur during decommissioning phases. Spills have tly affect wigeon utilising intertidal and pitats resulting in mortality. Unplanned or user plastic during construction and nases also has the potential to cause ough ingestion or entanglement. tigation measures of standard best waste management, pollution prevention oter 27: Waste and Material sources of e likelihood of these events occurring herefore not significantly adverse. n Chapter 27 are summarised in the MP and detail incorporating a Materials MMP') and Site Waste Management e contractor, once appointed. The key P are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Identify op managem</li> <li>Identify the second second</li></ul>
					increase r
					<ul> <li>Identify su and record transfer no notes; and</li> </ul>
					Consider a materials that will be operative recycling.
					Best practice recomm contamination will be CEMP or equivalent, a consultees prior to co Measures detail in Ch captured in the Onsho
					<ul> <li>Designate materials,</li> </ul>
					On-site av including a for use in t
					Use of drip
					Drain so watercours
					Therefore, no in comb
Bar-tailed godwit	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Bar-tailed godwit is co to disturbance. Theref associated with HDD disturb this species. T occasion only (of a sin Study Area (ES Appe these areas to the Pro decommissioning wor godwit from favoured events, although it is e



opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

r appropriate site practices such as how s will be segregated and the measures be used for raising awareness among site e for waste reduction, reuse and .

mendations for the prevention of e outlined in more detail in a Final , and agreed with relevant statutory commencement of construction works. Chapter 19: Groundwater and further nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the irse

hbination adverse effect is predicted.

considered to be of moderate sensitivity efore, the presence of construction D works in Langstone Harbour may This species was recorded on a single single individual) in intertidal areas of the rendix 16.13). Given the proximity of roposed Development, construction and orks may displace wintering bar-tailed d habitat through unpredictable noise s evident that only very small numbers

WSP/Natural Power

onservation Objectives	Effect	Attribute	Target	Assessment
onservation Objectives	Effect	Attribute	Target	Assessment are present. The Pro- industrialised setting not add significantly to where HDD routes un not coincide with the construction stage or SPA and it's wintering avoided by restricting defined as October to such as bar-tailed go (Snow and Perrins, 1 are provided in Chap 16.14: Winter Workin Chichester & Langsto principles that will be Those relevant to bar intertidal habitat only Development are Print • Principle that are of in any res • Principle LAeq imm adjacent • Principle LAeq imm is conside Development • Principle Can occur
	onservation Objectives	onservation Objectives Effect	onservation Objectives     Effect     Attribute	onservation Objectives     Effect     Attribute



oposed Development is within an g suggesting that the noise effects would to baseline conditions. Other than underlie the SPA, the Order Limits do e SPA itself. Furthermore, effects of the on Chichester and Langstone Harbour ng intertidal bird community will be ng works within the winter season, to March (the period when SPA birds odwit arrive from their breeding grounds 1998). Details of the working restriction pter 16: Onshore Ecology and Appendix ing Restriction for Features of tone Harbours SPA, and comprise eight e incorporated into working methods. ar-tailed godwit which was recorded in y during surveys for the Proposed rinciples 4 – 8:

e 4: Elements of the Onshore Cable Route over 400 m from the SPA are not included estriction.

e 5: Construction noise events of <55 dB ur unrestricted.

e 6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or t to industrial sites with notable levels of noise can be undertaken unrestricted. It dered that noise levels from the Proposed ment would be masked in these s.

e 7: Regular/consistent construction noise LAeq) and irregular/sudden construction 0-72 dB LAeq implies potential for impacts nore sensitive species e.g. shelduck and occur if effects do not overlap with areas PA identified as supporting this species.

e 8: Irregular construction noise (>70dB hat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					wintering the arrival Adoption of these prin and vibration on birds principles mandate th sites 2 and 3 will not tailed godwit are pres will not disturb them. displacement effects no significant effects Development, there is disturbance and disp
		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g <i>Arenicola, Nereis</i> ) at preferred sizes.	Unplanned oil or cher the construction and the potential to direct intertidal and other su Unplanned disposal of construction and dece potential to cause ba ingestion or entangler measures of standard management, pollution 27: Waste and Mater likelihood of these eventherefore not significat Chapter 27 are summand detail incorporati ('MMP') and Site Wast contractor, once apport are to:



period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise Is within the SPA. Additionally, the hat vibropiling associated with HDD take place during the period where baresent in notable numbers, and therefore

Therefore, potential disturbance and are not likely significantly adverse. As are predicted for the Proposed is no contribution to in combination placement.

mical spillages from may occur during decommissioning phases. Spills have tly affect bar-tailed godwit utilising supporting habitats resulting in mortality. of industrial or user plastic during commissioning phases also has the ar-tailed godwit mortality through ement. However, routine mitigation rd best practice in terms of waste on prevention measures (see Chapter rial sources of the ES) will make the vents occurring highly unlikely and antly adverse. Measures detailed in marised in the Onshore Outline CEMP ing a Materials Management Plan aste Management Plan ('SWMP') by the pointed. The key matters of the SWMP

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					transfer no notes; and Consider materials that will be operative recycling. Best practice recomm contamination will be CEMP or equivalent, consultees prior to co Measures detail in Ch captured in the Onsho Designate materials, On-site av including a for use in Use of dri Drain so watercour
Curlew	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Curlew is considered disturbance. Therefore associated with HDD disturb this species. T tide surveys and occa areas of the Study Are Appendix 16.13). Give Proposed Development works may displace we through unpredictable Development is within that the noise effects conditions. Other that the Order Limits do not Furthermore, effects of and Langstone Harboo community will be ave winter season, define



notes and hazardous waste consignment

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory ommencement of construction works. Chapter 19: Groundwater and further hore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals.;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the rse

hbination adverse effect is predicted.

to be of moderate sensitivity to ore, the presence of construction D works in Langstone Harbour may This species was recorded at all low casional surveys at high tide in intertidal rea with up to 61 individuals seen (ES ven the proximity of these areas to the ent, construction and decommissioning wintering curlew from favoured habitat le noise events. The Proposed in an industrialised setting suggesting s would not add significantly to baseline an where HDD routes underlie the SPA, not coincide with the SPA itself. of the construction stage on Chichester our SPA and it's wintering intertidal bird

voided by restricting works within the ed as October to March (the period

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					when SPA birds such grounds (Snow and P restriction are provide Appendix 16.14: Winte Chichester & Langston principles that will be in Those relevant to curle intertidal habitat and S for the Proposed Deve
					<ul> <li>Principle 1 in SWBG primary or Proposed October – park withir movement no functio waterbirds Langstone</li> </ul>
					<ul> <li>Principle 4 that are ov in any rest</li> </ul>
					Principle 5 can occur
					<ul> <li>Principle &amp; LAeq imme adjacent to existing no is consider Developme instances.</li> </ul>
					<ul> <li>Principle 7 (&gt;70dB LA noise 60-7 on the mo brent gees overlap w supporting</li> </ul>



ch as curlew arrive from their breeding Perrins, 1998). Details of the working ded in Chapter 16: Onshore Ecology and nter Working Restriction for Features of tone Harbours SPA, and comprise eight e incorporated into working methods. urlew which was recorded in both

SWBGS sites (e.g. 23b) during surveys velopment are Principles 1, 4–8:

e 1: Construction works cannot take place GS (those categorised as either core, or secondary) sites that overlap with the ed Developments Order Limits during – March. An exception is the gravel car hin site P11 that is already disturbed by ents of cars, lorries and plant, and offers tional habitat for brent geese or other ds associated with Chichester and ne Harbour SPA.

4: Elements of the Onshore Cable Route over 400 m from the SPA are not included striction.

5: Construction noise events of <55 dB ir unrestricted.

6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or to industrial sites with notable levels of noise can be undertaken unrestricted. It lered that noise levels from the Proposed ment would be masked in these s.

7: Regular/consistent construction noise LAeq) and irregular/sudden construction -72 dB LAeq implies potential for impacts nore sensitive species e.g. dark-bellied ese and can only occur if effects do not with areas of the SPA identified as ng this species.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					<ul> <li>Principle a LAeq) tha restricted HDD 2 ar wintering p the arrival</li> </ul>
					Adoption of these prin and vibration on birds principles mandate the sites 2 and 3 will not to curlew are present in not disturb them There displacement effects a no significant effects a Development, there is disturbance and displa
		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g earthworm, leatherjackets, <i>Coleoptera,</i> <i>Orthoptera, Carcinus, Nereis</i> ) at preferred sizes.) at preferred sizes.	Unplanned oil or chem the construction and o the potential to directly other supporting habit disposal of industrial of decommissioning pha curlew mortality throug However, routine mitig practice in terms of wa measures (see Chapt the ES) will make the highly unlikely and the Measures detailed in Onshore Outline CEM Management Plan ('M Plan ('SWMP') by the matters of the SWMP
					<ul> <li>Identify the produced potential feedback</li> <li>Identify potential</li> </ul>
					out; • Identify op manageme



8: Irregular construction noise (>70dB nat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise is within the SPA. Additionally, the that vibropiling associated with HDD take place during the period where in notable numbers, and therefore will erefore, potential disturbance and is are not likely significantly adverse. As are predicted for the Proposed is no contribution to in combination placement.

mical spillages from may occur during decommissioning phases. Spills have tly affect curlew utilising intertidal and bitats resulting in mortality. Unplanned or user plastic during construction and hases also has the potential to cause ugh ingestion or entanglement. tigation measures of standard best waste management, pollution prevention oter 27: Waste and Material sources of e likelihood of these events occurring herefore not significantly adverse. n Chapter 27 are summarised in the MP and detail incorporating a Materials MMP') and Site Waste Management e contractor, once appointed. The key P are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and ment;

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Identify the increase relation increase relation increase relationship surplication increase relationship surplication increase relationship records transfer not records records</li></ul>
					materials that will be operative recycling.
					Best practice recomm contamination will be or equivalent, and agr prior to commencement detail in Chapter 19: 00 the Onshore Outline 00
					<ul> <li>Designated materials,</li> </ul>
					<ul> <li>On-site avaincluding a for use in t</li> </ul>
					Use of drip
					<ul> <li>Drain soc watercours</li> </ul>
					Therefore, no in comb
Grey plover	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	Grey plover is consider disturbance. Therefore associated with HDD v disturb this species. or surveys (peak count or sighting at high tide. T mud habitat mainly in Appendix 16.13). Give Proposed Development works may displace w through unpredictable Development is within



the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

r appropriate site practices such as how s will be segregated and the measures be used for raising awareness among site e for waste reduction, reuse and .

mendations for the prevention of e outlined in more detail in a final CEMP greed with relevant statutory consultees ent of construction works. Measures c Groundwater and further captured in CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the irse.

hbination adverse effect is predicted.

dered to be of moderate sensitivity to bre, the presence of construction D works in Langstone Harbour may occurred only at low tide during the of 19 in January 2018), with only one This species was restricted to intertidal n the south of the survey area (ES ven the proximity of these areas to the lent, construction and decommissioning wintering curlew from favoured habitat le noise events. The Proposed in an industrialised setting suggesting

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect		Target	Assessment that the noise effects conditions. Other than where HI Limits do not coincid effects of the constru- Langstone Harbour S community will be av- winter season, define when SPA birds such breeding grounds (S working restriction at Ecology and Append Features of Chichest comprise eight princ working methods. The recorded in intertidal Proposed Developm Principle that are of in any rest Principle LAeq immadjacent existing noise for on the madjacent sonsid Developminstances Principle (>70dB L noise 60 on the madian areas of species. Principle LAeq) the restricted HDD 2 at



## s would not add significantly to baseline

IDD routes underlie the SPA, the Order de with the SPA itself. Furthermore, ruction stage on Chichester and SPA and it's wintering intertidal bird avoided by restricting works within the ned as October to March (the period ch as grey plover arrive from their Snow and Perrins, 1998). Details of the are provided in Chapter 16: Onshore ndix 16.14: Winter Working Restriction for ster & Langstone Harbours SPA, and ciples that will be incorporated into Those relevant to grey plover which was al habitat only during surveys for the nent are Principles 4 - 8:

e 4: Elements of the Onshore Cable Route over 400 m from the SPA are not included estriction.

e 5: Construction noise events of <55 dB ur unrestricted.

e 6: Construction works of 55 – 72 dB mediately adjacent to a major road and/or t to industrial sites with notable levels of noise can be undertaken unrestricted. It dered that noise levels from the Proposed oment would be masked in these es.

e 7: Regular/consistent construction noise LAeq) and irregular/sudden construction 0-72 dB LAeq implies potential for impacts more sensitive species e.g. grey plover only occur if effects do not overlap with f the SPA identified as supporting this

e 8: Irregular construction noise (>70dB hat is exposed to the SPA should be d during October – March. Vibropiling at and 3 will not be undertaken during the

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					wintering p the arrival
					Adoption of these prin and vibration on birds principles mandate the sites 2 and 3 will not to grey plover are presen will not disturb them
		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g <i>Nereis, Arenicola</i> and <i>Notomastus</i> ) at preferred sizes.	Unplanned oil or chem the construction and of the potential to directly and other supporting I Unplanned disposal of construction and deco potential to cause gree entanglement. However standard best practice pollution prevention m Material sources of the events occurring high significantly adverse. summarised in the Or incorporating a Materi Site Waste Managem once appointed. The H ldentify the produced potential for ldentify op management ldentify op management ldentify su and record transfer no notes; and Consider a materials
					materialo



period, with sheet piles inserted prior to al of wintering SPA birds.

inciples will offset direct effects of noise Is within the SPA. Additionally, the hat vibropiling associated with HDD take place during the period where ent in notable numbers, and therefore

mical spillages from may occur during decommissioning phases. Spills have tly affect grey plover utilising intertidal habitats resulting in mortality. of industrial or user plastic during commissioning phases also has the ey plover mortality through ingestion or ever, routine mitigation measures of ce in terms of waste management, measures (see Chapter 27: Waste and the ES) will make the likelihood of these hly unlikely and therefore not Measures detailed in Chapter 27 are Onshore Outline CEMP and detail rials Management Plan ('MMP') and ment Plan ('SWMP') by the contractor, key matters of the SWMP are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how

will be segregated and the measures

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					that will be operative recycling. Best practice recomm contamination will be CEMP or equivalent, a consultees prior to con Measures detail in Ch captured in the Onsho Designate materials, On-site av including a for use in the Drain soo watercourse
Turnstone		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g <i>Balanus, Mytilus, Carcinus, Gammarus,</i> <i>Littorina,</i> dipertan flies, kelp-fly larvae) at preferred sizes.	Unplanned oil or chem the construction and o the potential to directly and other supporting h Unplanned disposal of construction and deco potential to cause turn entanglement. Howeve standard best practice pollution prevention m Material sources of the events occurring highly significantly adverse. I summarised in the On incorporating a Materia Site Waste Manageme once appointed. The k produced potential for



be used for raising awareness among site for waste reduction, reuse and .

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory ommencement of construction works. Chapter 19: Groundwater and further nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the irse.

hbination adverse effect is predicted.

mical spillages from may occur during decommissioning phases. Spills have tly affect turnstone utilising intertidal habitats resulting in mortality. of industrial or user plastic during commissioning phases also has the rnstone mortality through ingestion or ever, routine mitigation measures of ce in terms of waste management, measures (see Chapter 27: Waste and the ES) will make the likelihood of these hly unlikely and therefore not Measures detailed in Chapter 27 are Onshore Outline CEMP and detail rials Management Plan ('MMP') and ment Plan ('SWMP') by the contractor, key matters of the SWMP are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Identify proout;</li> <li>Identify op managem</li> <li>Identify the increase research</li> <li>Identify su and record transfer not notes; and</li> <li>Consider materials that will be operative recycling.</li> <li>Best practice recommender record the Onshore Outline of the Onshore Outline of the Onshore Outline of the Onshore Outline of the Onshore of the Onshor</li></ul>
					Therefore, no in comb
Sanderling		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g <i>Bathyporeia</i> and <i>Mytilus</i> spat, wrack flies, sandhoppers) at preferred sizes.	Unplanned oil or chem the construction and o the potential to directly and other supporting H Unplanned disposal o construction and deco potential to cause sam



possible options for waste to be 'designed

opportunities for waste minimisation and ment;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

r appropriate site practices such as how s will be segregated and the measures be used for raising awareness among site e for waste reduction, reuse and .

mendations for the prevention of e outlined in more detail in a final CEMP greed with relevant statutory consultees ent of construction works. Measures Groundwater and further captured in CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the Irse

hbination adverse effect is predicted.

emical spillages from may occur during decommissioning phases. Spills have stly affect sanderling utilising intertidal g habitats resulting in mortality. of industrial or user plastic during commissioning phases also has the anderling mortality through ingestion or

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					entanglement. However standard best practices pollution prevention me Material sources of the events occurring high significantly adverse. summarised in the Ore incorporating a Materia Site Waste Manageme once appointed. The Me
					<ul> <li>Identify the produced potential fermion</li> </ul>
					<ul> <li>Identify po out;</li> </ul>
					<ul> <li>Identify op managem</li> </ul>
					<ul> <li>Identify the increase relation</li> </ul>
					<ul> <li>Identify su and record transfer no notes; and</li> </ul>
					<ul> <li>Consider a materials that will be operative recycling.</li> </ul>
					Best practice recomm contamination will be or equivalent, and age prior to commenceme detail in Chapter 19: 0 the Onshore Outline 0
					<ul> <li>Designate materials,</li> </ul>



ever, routine mitigation measures of ce in terms of waste management, measures (see Chapter 27: Waste and the ES) will make the likelihood of these hly unlikely and therefore not

. Measures detailed in Chapter 27 are Onshore Outline CEMP and detail erials Management Plan ('MMP') and ment Plan ('SWMP') by the contractor, e key matters of the SWMP are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and ment;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and

mendations for the prevention of e outlined in more detail in a final CEMP greed with relevant statutory consultees ent of construction works. Measures Groundwater and further captured in

CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>On-site av including a for use in t</li> </ul>
					<ul> <li>Use of drip</li> </ul>
					<ul> <li>Drain so watercours</li> </ul>
					Therefore, no in comb
Ringed plover		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g invertebrates, marine worms, crustaceans and molluscs) at preferred sizes.	Unplanned oil or chem the construction and of the potential to directly and other supporting Unplanned disposal of construction and deco potential to cause ring or entanglement. How standard best practice pollution prevention m Material sources of the events occurring high significantly adverse. summarised in the Or incorporating a Materi Site Waste Managem once appointed. The H ldentify the produced potential fo ldentify po out; ldentify op managem ldentify su and record transfer no notes; and



availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the irse.

hbination adverse effect is predicted.

emical spillages from may occur during decommissioning phases. Spills have tly affect ringed plover utilising intertidal habitats resulting in mortality. of industrial or user plastic during commissioning phases also has the nged plover mortality through ingestion owever, routine mitigation measures of ce in terms of waste management, measures (see Chapter 27: Waste and the ES) will make the likelihood of these hly unlikely and therefore not Measures detailed in Chapter 27 are Onshore Outline CEMP and detail erials Management Plan ('MMP') and ment Plan ('SWMP') by the contractor, key matters of the SWMP are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and ment;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Consider materials that will be operative recycling.</li> <li>Best practice recomm contamination will be or equivalent, and ag prior to commenceme detail in Chapter 19: 0 the Onshore Outline</li> <li>Designate materials,</li> <li>On-site av including a for use in</li> <li>Use of dri</li> <li>Drain so watercour</li> </ul>
Dunlin		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items e.g <i>Nereis, Macoma, Hydrobia, Crangon, Carcinus</i> , dipertan flies, beetles, caddisfly, wasps, sawflies, mayflies) at preferred sizes.	Unplanned oil or cher the construction and the potential to direct other supporting habi disposal of industrial decommissioning pha dunlin mortality throug However, routine miti practice in terms of w measures (see Chapt the ES) will make the highly unlikely and the Measures detailed in Onshore Outline CEM Management Plan ('M Plan ('SWMP') by the matters of the SWMP



r appropriate site practices such as how s will be segregated and the measures be used for raising awareness among site e for waste reduction, reuse and .

amendations for the prevention of be outlined in more detail in a final CEMP agreed with relevant statutory consultees nent of construction works. Measures be: Groundwater and further captured in the CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the urse.

hbination adverse effect is predicted.

mical spillages from may occur during decommissioning phases. Spills have tly affect dunlin utilising intertidal and bitats resulting in mortality. Unplanned or user plastic during construction and nases also has the potential to cause ugh ingestion or entanglement. tigation measures of standard best waste management, pollution prevention oter 27: Waste and Material sources of e likelihood of these events occurring nerefore not significantly adverse. n Chapter 27 are summarised in the MP and detail incorporating a Materials MMP') and Site Waste Management e contractor, once appointed. The key P are to:

WSP/Natural Power

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Identify th produced potential f</li> </ul>
					<ul> <li>Identify po out;</li> </ul>
					<ul> <li>Identify o managem</li> </ul>
					<ul> <li>Identify t increase</li> </ul>
					<ul> <li>Identify s and recor- transfer n notes; and</li> </ul>
					<ul> <li>Consider materials that will be operative recycling.</li> </ul>
					Best practice recommon contamination will be CEMP or equivalent, consultees prior to co Measures detail in Cl captured in the Onshe
					<ul> <li>Designate materials,</li> </ul>
					<ul> <li>On-site av including for use in</li> </ul>
					Use of dri
					<ul> <li>Drain so watercour</li> </ul>
					Therefore, no in com
Supporting habitat	Maintaining or restoring the extent, distribution, structure, function and	Accidental spills and Litter	Supporting habitat: quality of	Maintain the structure, function and availability of the following habitats which support the assemblage feature for all stages (moulting,	Unplanned oil or cher activity may occur du phases. Spills have th



he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and ment;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

appropriate site practices such as how will be segregated and the measures be used for raising awareness among site for waste reduction, reuse and

mendations for the prevention of e outlined in more detail in a Final , and agreed with relevant statutory commencement of construction works. Chapter 19: Groundwater and further nore Outline CEMP include:

ted areas for the storage of hazardous s, fuels and chemicals;

availability of oil spill clean-up equipment absorbent material and inflatable booms in the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the irse.

hbination adverse effect is predicted.

emical spillages from construction luring construction and decommissioning the potential to directly affect prey

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	supporting processes of the habitats of the qualifying features		supporting non- breeding habitat	n- roosting, loafing, feeding) of the non-breeding	species within support biological effects. Unp during all development affect prey species the However, routine miting practice in terms of with measures (see Chapt the ES) will make the highly unlikely and the Measures detailed in Onshore Outline CEM Management Plan ('M Plan ('SWMP') by the matters of the SWMP
					<ul> <li>Identify the produced potential fer</li> </ul>
					<ul> <li>Identify po out;</li> </ul>
					<ul> <li>Identify op managem</li> </ul>
					<ul> <li>Identify the increase relation</li> </ul>
					<ul> <li>Identify su and record transfer no notes; and</li> </ul>
					<ul> <li>Consider materials that will be operative recycling.</li> </ul>
					Best practice recomm contamination will be CEMP or equivalent, consultees prior to co Measures detail in Ch captured in the Onsho



orting habitats through a range of nplanned disposal of industrial plastic ent phases also has the potential to hrough ingestion or entanglement. tigation measures of standard best waste management, pollution prevention oter 27: Waste and Material sources of e likelihood of these events occurring herefore not significantly adverse. In Chapter 27 are summarised in the EMP and detail incorporating a Materials MMP') and Site Waste Management e contractor, once appointed. The key P are to:

he volume of waste streams likely to be d during the works to establish the for reuse and recycling;

ossible options for waste to be 'designed

opportunities for waste minimisation and nent;

the most significant opportunities to re-use and recycling rates;

suitable waste management contractors ord appropriate licences, permits, waste notes and hazardous waste consignment nd

r appropriate site practices such as how s will be segregated and the measures be used for raising awareness among site e for waste reduction, reuse and .

mendations for the prevention of e outlined in more detail in a Final and agreed with relevant statutory ommencement of construction works. Chapter 19: Groundwater and further nore Outline CEMP include:

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Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment
					<ul> <li>Designate materials,</li> </ul>
					<ul> <li>On-site av including a for use in</li> </ul>
					<ul> <li>Use of dri</li> </ul>
					<ul> <li>Drain soo watercours</li> </ul>
					Therefore, no in comb
Conclusion	: Due to the short-term and m	inor magnitude o	of potential effects, t	together with the application of standard best p	

significant adverse effect on site integrity can be concluded, either from the Proposed Development alone, or in combination with other plans or projects, for the Chichester and Langstone Harbours SPA/Ramsar site.



ted areas for the storage of hazardous s, fuels and chemicals.;

availability of oil spill clean-up equipment absorbent material and inflatable booms the event of an oil spill or leak;

rip trays under mobile plant; and

ocks to trap sediment entering the irse.

hbination adverse effect is predicted. easures where required, no

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### 10.5. PORTSMOUTH HARBOUR SPA/RAMSAR SITE

#### OVERVIEW

- 10.5.1.1. Portsmouth Harbour is a large, industrialised estuary. Together with the adjacent Chichester and Langstone Harbours, it forms one of the most important sheltered intertidal areas on the south coast of England. The site is composed of extensive intertidal mudflats and sandflats with seagrass beds, areas of saltmarsh, shallow coastal waters, coastal lagoons and coastal grazing marsh (Natural England, 2019b).
- 10.5.1.2. At low tide the extensive mudflats are exposed, the water drained by channels and creeks uniting to form a narrow exit into the Solent. There is comparatively little freshwater input to Portsmouth Harbour. The largest input is the River Wallington, which flows into Fareham Creek in the north-west of Portsmouth Harbour. The estuarine sediments support rich populations of intertidal invertebrates, which provide an important food source for overwintering birds (Natural England, 2019b).

#### 10.5.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.5.2.1. Site-specific SACO is available for the Portsmouth Harbour SPA<sup>39</sup>. Table 10-7 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

#### Table 10.7 - SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Red-breasted merganser Supporting habitat (water column)	Accidental spills and Litter	Supporting habitat: water quality - contaminants

- 10.5.2.2. Non-equivalent attributes listed within the SACO which were screened out from further assessment included:
  - Breeding population: abundance;
  - Connectivity with supporting habitats;
  - Disturbance caused by human activity;
  - Predation all habitats;
  - Supporting habitat: food availability;
  - Supporting habitat: air quality;

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<sup>&</sup>lt;sup>39</sup><u>https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9011051&SiteName=portsmouth%20harbour&SiteNameDisplay=Portsmouth+Harbour+SPA&countyCode=&responsiblePerson=&Sea Area=&IFCAArea=&NumMarineSeasonality=4 (Accessed October 2019)</u>



- Supporting habitat: conservation measures;
- Supporting habitat: extent and distribution of supporting habitat for the breeding season;
- Supporting habitat: landform;
- Supporting habitat: vegetation characteristics for nesting;
- Supporting habitat: water quality turbidity;
- Supporting habitat: water quality DO; and
- Supporting habitat: water quality nutrients.

#### ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.5.2.3. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10-8 below.
- 10.5.2.4. Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity, arising from the Proposed Development alone, or in combination with other plans or projects, can be concluded for the Portsmouth Harbour SPA/Ramsar site.

Table 10.8 - Assessment of potential adverse effects on site integrity for the Portsmouth Harbour SPA/Ramsar site across all phases of the Proposed Development both alone and in combination with other plans or projects.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Red-breasted merganser	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the po- within the water column through a range disposal of industrial or user plastic duri the potential to affect prey species throu However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consider be no adverse effects on site integrity fr Given the scale and nature of other pote requirement to adhere to similar best pr contribute to in combination effects, it is effect on site integrity in combination wi
Supporting habitat (water column)	Maintaining or restoring the extent, distribution, structure, function and supporting processes of the habitats of the qualifying features.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the po- within the water column through a range disposal of industrial or user plastic duri the potential to affect prey species throu However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consider be no adverse effects on site integrity fr Given the scale and nature of other pote requirement to adhere to similar best pr contribute to in combination effects, it is effect on site integrity in combination with

Conclusion: Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity can be concluded, either from the Proposed Development alone, or in combination with other plans or projects, for the Portsmouth Harbour SPA/Ramsar site.



om vessels may occur during all potential to directly affect prey species ge of biological effects. Unplanned ring all development phases also has ough ingestion or entanglement.

of standard best practice in terms of on measures and strict navigational ese events occurring highly unlikely and eration of mitigation measures, there will from the Proposed Development alone.

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of standard best practice in terms of on measures and strict navigational ese events occurring highly unlikely and eration of mitigation measures, there will from the Proposed Development alone.

ptential plans and projects and the practice measures which could is predicted that there will be no adverse vith other plans and projects.

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### 10.6. SOLENT AND SOUTHAMPTON WATER SPA/RAMSAR

#### 10.6.1. **OVERVIEW**

- 10.6.1.1. The Solent and Southampton Water SPA is located in one of the only major sheltered channels in Europe, lying between a substantial island (the Isle of Wight) and the mainland, on the south coast of England. It stretches from Hurst Spit to Hill Head across Hampshire, and on the north coast of the Isle of Wight from Yarmouth to Whitecliff Bay (Natural England, 2019c).
- 10.6.1.2. This area is a complex major estuarine system consisting of coastal plain estuaries including the Yar, Medina, King's Quay Shore, and the Hamble. Bar-built estuaries including Newtown Harbour and Beaulieu also occupy the SPA. The Solent and its inlets are unique in Britain and Europe for their unusual tidal regime, including double tides and long periods of tidal stand at high and low tide (Natural England, 2019c).
- 10.6.1.3. The Solent and Southampton Water is composed of extensive intertidal mudflats and sandbanks, inter- and subtidal rock, areas of saltmarsh, coastal lagoons, coastal reed beds, shingle banks, and grazing marsh.
- 10.6.1.4. The shingle banks also provide important breeding grounds for terns.

#### 10.6.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.6.2.1. Site-specific SACO is available for the Solent and Southampton Water SPA<sup>40</sup>. Table 10-9 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Little tern Sandwich tern	Accidental spills and Litter	Supporting habitat: water quality - contaminants
Common tern		
Roseate tern		
Supporting habitat (water column)		

#### Table 10.9- SACO attributes screened in for assessment

10.6.2.2. Non-equivalent attributes listed within the SACO which were screened out from further assessment included:

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<sup>&</sup>lt;sup>40</sup>https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9011061&SiteName=so lent&SiteNameDisplay=Solent+and+Southampton+Water+SPA&countyCode=&responsiblePerson=&SeaArea =&IFCAArea=&NumMarineSeasonality=9 (Accessed October 2019)



- Breeding population: abundance;
- Connectivity with supporting habitats;
- Disturbance caused by human activity;
- Predation all habitats;
- Supporting habitat: food availability;
- Supporting habitat: air quality;
- Supporting habitat: conservation measures;
- Supporting habitat: extent and distribution of supporting habitat for the breeding season;
- Supporting habitat: landform;
- Supporting habitat: vegetation characteristics for nesting;
- Supporting habitat: water quality turbidity;
- Supporting habitat: water quality DO; and
- Supporting habitat: water quality nutrients.

#### 10.6.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.6.3.1. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10-10 below.
- 10.6.3.2. Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity, arising from either the Proposed Development alone, or in combination with other plans or projects, can be concluded for the Solent and Southampton Water SPA/Ramsar site.

Table 10.10- Assessment of potential adverse effects on site integrity for the Solent and Southampton Water SPA/Ramsar site across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Little tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the pote within the water column through a range disposal of industrial or user plastic during potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consideration be no adverse effects on site integrity from Given the scale and nature of other poter requirement to adhere to similar best prac- to in combination effects, it is predicted the site integrity in combination with other plan
Sandwich tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the pote within the water column through a range disposal of industrial or user plastic during potential to affect prey species through in routine mitigation measures of standard k management, pollution prevention measur will make the likelihood of these events of is predicted that, in consideration of mitig adverse effects on site integrity from the Given the scale and nature of other poter requirement to adhere to similar best prace to in combination effects, it is predicted the site integrity in combination with other pla
Common tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the pote within the water column through a range disposal of industrial or user plastic during potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consideration be no adverse effects on site integrity from Given the scale and nature of other poter requirement to adhere to similar best prac-



n vessels may occur during all otential to directly affect prey species e of biological effects. Unplanned ing all development phases also has the ingestion or entanglement.

of standard best practice in terms of n measures and strict navigational se events occurring highly unlikely and ration of mitigation measures, there will om the Proposed Development alone. ential plans and projects and the

actice measures which could contribute that there will be no adverse effect on lans and projects.

n vessels may occur during all otential to directly affect prey species e of biological effects. Unplanned ing all development phases also has the ingestion or entanglement. However, best practice in terms of waste sures and strict navigational protocols occurring highly unlikely and therefore it igation measures, there will be no e Proposed Development alone.

ential plans and projects and the actice measures which could contribute that there will be no adverse effect on lans and projects.

n vessels may occur during all otential to directly affect prev species e of biological effects. Unplanned ing all development phases also has the ingestion or entanglement.

of standard best practice in terms of n measures and strict navigational se events occurring highly unlikely and ration of mitigation measures, there will om the Proposed Development alone.

ential plans and projects and the actice measures which could contribute

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					to in combination effects, it is predicted the site integrity in combination with other place
Roseate tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the pote within the water column through a range disposal of industrial or user plastic durin potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consideration be no adverse effects on site integrity from Given the scale and nature of other poten requirement to adhere to similar best pra- to in combination effects, it is predicted the site integrity in combination with other plan
Mediterranean gull	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the pote within the water column through a range disposal of industrial or user plastic durin potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in considera be no adverse effects on site integrity fro Given the scale and nature of other poter requirement to adhere to similar best pra to in combination effects, it is predicted the site integrity in combination with other pla
Supporting habitat (water column)	Maintaining or restoring the extent, distribution, structure, function and supporting processes of the habitats of the qualifying features.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the pote within the water column through a range disposal of industrial or user plastic durin potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consideration be no adverse effects on site integrity fro Given the scale and nature of other poter requirement to adhere to similar best pra



that there will be no adverse effect on plans and projects.

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n vessels may occur during all otential to directly affect prey species e of biological effects. Unplanned ing all development phases also has the ingestion or entanglement.

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ential plans and projects and the ractice measures which could contribute that there will be no adverse effect on plans and projects.

n vessels may occur during all otential to directly affect prey species e of biological effects. Unplanned ing all development phases also has the ingestion or entanglement.

of standard best practice in terms of n measures and strict navigational se events occurring highly unlikely and ration of mitigation measures, there will rom the Proposed Development alone.

ential plans and projects and the actice measures which could contribute

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					to in combination effects, it is predicted that site integrity in combination with other plan

Conclusion: Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity, arising either from the Proposed Development alone, or in combination with other plans or projects, can be concluded for the Solent and Southampton Water SPA/Ramsar site.



that there will be no adverse effect on lans and projects.

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### 10.7. PAGHAM HARBOUR SPA/RAMSAR SITE

#### **OVERVIEW**

- 10.7.1.1. Pagham Harbour SPA lies between Bognor Regis and Chichester in West Sussex. The many natural habitats contained within and around the small harbour support a notable abundance of wildlife. The estuarine basin is made up of an extensive central area of saltmarsh and intertidal mud-flats, surrounded by lagoons, shingle, open water, reed swamp and wet permanent grassland. The mud-flats are rich in invertebrates and algae, and provide important feeding areas for the many bird species that use the site (Natural England, 2019d). The local RSPB have managed the site as a local nature reserve ('LNR') since 2013, amplifying the productivity and variety of species present.
- 10.7.1.2. Terns breed on the shingle habitats near the harbour entrance and depart on foraging trips to the coastal waters (Natural England, 2019d).

#### 10.7.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.7.2.1. Site-specific SACO is available for the Pagham Harbour SPA<sup>41</sup>. Table 10.11 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

#### Table 10.11- SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Common tern Supporting habitat (water column)	Accidental spills and Litter	Supporting habitat: water quality - contaminants

- 10.7.2.2. Non-equivalent attributes listed within the SACO which were screened out from further assessment included:
  - Breeding population: abundance;
  - Connectivity with supporting habitats;
  - Disturbance caused by human activity;
  - Predation all habitats;
  - Supporting habitat: food availability;
  - Supporting habitat: air quality;

<sup>&</sup>lt;sup>41</sup><u>https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9012041&SiteName=pagham&SiteNameDisplay=Pagham+Harbour+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea =&NumMarineSeasonality=4 (Accessed October 2019)</u>



- Supporting habitat: conservation measures;
- Supporting habitat: extent and distribution of supporting habitat for the breeding season;
- Supporting habitat: landform;
- Supporting habitat: vegetation characteristics for nesting;
- Supporting habitat: water quality turbidity;
- Supporting habitat: water quality DO; and
- Supporting habitat: water quality nutrients.

#### ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.7.2.3. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10-12 below.
- 10.7.2.4. Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity, arising from either the Proposed Development alone, or in combination with other plans or projects, can be concluded for the Pagham Harbour SPA/Ramsar site.

Table 10.12 - Assessment of potential adverse effects on site integrity for the Pagham Harbour SPA/Ramsar site across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Common tern	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the po- within the water column through a range disposal of industrial or user plastic duri the potential to affect prey species throu However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consider be no adverse effects on site integrity fr Given the scale and nature of other pote requirement to adhere to similar best pri contribute to in combination effects, it is effect on site integrity in combination with
Supporting habitat (water column)	Maintaining or restoring the extent, distribution, structure, function and supporting processes of the habitats of the qualifying features.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the po- within the water column through a range disposal of industrial or user plastic duri the potential to affect prey species through However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in consider be no adverse effects on site integrity for Given the scale and nature of other pote requirement to adhere to similar best pro- contribute to in combination effects, it is effect on site integrity in combination with

Conclusion: Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity can be concluded, either from the Proposed Development alone, or in combination with other plans or projects, for the Pagham Harbour SPA/Ramsar site.



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otential plans and projects and the practice measures which could is predicted that there will be no adverse vith other plans and projects.

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## 10.8. LITTORAL SEINO-MARIN SPA

#### **OVERVIEW**

- 10.8.1.1. The Littoral Seino-Marin SPA stretches along approximately 70 km of coastline of the coast of Haute-Normandie, from the port of Antifer to Cap d'Ailly. To the west of Veulettes sur mer, the site includes cliff, beach, and foreshore, extending seawards to the limit of French waters (12 nmi). The area east of Veulettes-sur-Mer is entirely marine, extending from the MLWS mark to the limit of French waters.
- 10.8.1.2. The major ecological interest is the presence of large numbers of seabirds, with two main colonies of breeding seabirds at Cap d'Antifer and Cap Fagnet. The site hosts significant numbers of fulmar, cormorant, herring gull and lesser black-backed gull. In addition, the SPA is home to the majority of shag, kittiwake and great black-backed gull nesting on the coast of the Pays de Caux. The cliffs at Cap Fagnet host more than 400 pairs of black-legged kittiwake, which represent nearly half of the breeding population of Haute-Normandie and is one of 10 sites that together host 90% of the French breeding population. Forty-two pairs of fulmars are also present at Cap Fagnet, representing a large proportion of the Upper Normandy population.
- 10.8.1.3. The Littoral Seino-Marin SPA also hosts nationally and internationally important numbers of inshore wintering waterfowl (including grebes, divers and auks), as well as migratory seabirds, including terns, gulls and gannets.
- 10.8.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)
- 10.8.2.1. Site-specific SACO is not available for the Littoral Seino-Marin SPA. As such, SACO available for the UK SPAs considered have been used as a basis for the assessment. Table 10.13 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Fulmar Kittiwake Herring gull Great black-backed gull	Accidental spills and Litter	Supporting habitat: water quality - contaminants

#### Table 10.13 - SACO attributes screened in for assessment

- 10.8.2.2. Non-equivalent attributes listed within the SACO which were screened out from further assessment included:
  - Breeding population: abundance;
  - Connectivity with supporting habitats;



- Disturbance caused by human activity;
- Predation all habitats;
- Supporting habitat: food availability;
- Supporting habitat: air quality;
- Supporting habitat: conservation measures;
- Supporting habitat: extent and distribution of supporting habitat for the breeding season;
- Supporting habitat: landform;
- Supporting habitat: vegetation characteristics for nesting;
- Supporting habitat: water quality turbidity;
- Supporting habitat: water quality DO; and
- Supporting habitat: water quality nutrients.

#### ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.8.2.3. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10.14 below.
- 10.8.2.4. Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity, arising from either the Proposed Development alone, or in combination with other plans or projects, can be concluded for the Littoral Seino Marine SPA.

# Table 10.14- Assessment of potential adverse effects on site integrity for the Littoral Seino-Marin SPA across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Fulmar	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the por- within the water column through a range disposal of industrial or user plastic durin the potential to affect prey species throug However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of thes therefore it is predicted that, in considera be no adverse effects on site integrity fro Given the scale and nature of other pote requirement to adhere to similar best pra- contribute to in combination effects, it is effect on site integrity in combination with
Kittiwake	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the por- within the water column through a range disposal of industrial or user plastic durin the potential to affect prey species throug However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of thes therefore it is predicted that, in considera be no adverse effects on site integrity fro Given the scale and nature of other pote requirement to adhere to similar best pra- contribute to in combination effects, it is
Herring gull	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	effect on site integrity in combination with Unplanned oil or chemical spillages from development phases. Spills have the por within the water column through a range disposal of industrial or user plastic durin the potential to affect prey species throug However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of thes therefore it is predicted that, in considera be no adverse effects on site integrity from Given the scale and nature of other pote requirement to adhere to similar best pra-



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of standard best practice in terms of on measures and strict navigational ese events occurring highly unlikely and eration of mitigation measures, there will from the Proposed Development alone.

tential plans and projects and the ractice measures which could s predicted that there will be no adverse rith other plans and projects.

om vessels may occur during all potential to directly affect prey species ge of biological effects. Unplanned ring all development phases also has bugh ingestion or entanglement.

of standard best practice in terms of on measures and strict navigational ese events occurring highly unlikely and eration of mitigation measures, there will from the Proposed Development alone.

otential plans and projects and the practice measures which could is predicted that there will be no adverse with other plans and projects.

m vessels may occur during all otential to directly affect prey species ge of biological effects. Unplanned ring all development phases also has ugh ingestion or entanglement.

of standard best practice in terms of on measures and strict navigational ese events occurring highly unlikely and eration of mitigation measures, there will from the Proposed Development alone.

tential plans and projects and the ractice measures which could

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					contribute to in combination effects, it is effect on site integrity in combination with
Great black- backed gull	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from development phases. Spills have the pot within the water column through a range disposal of industrial or user plastic durin the potential to affect prey species throug However, routine mitigation measures of waste management, pollution prevention protocols will make the likelihood of these therefore it is predicted that, in considera be no adverse effects on site integrity fro Given the scale and nature of other pote requirement to adhere to similar best pra contribute to in combination effects, it is effect on site integrity in combination with

Conclusion: Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity can be concluded for the Littoral Seino-Marin SPA, arising from either the Proposed Development alone, or in combination with other plans or projects.



s predicted that there will be no adverse it other plans and projects.

m vessels may occur during all otential to directly affect prey species je of biological effects. Unplanned ring all development phases also has ugh ingestion or entanglement.

of standard best practice in terms of on measures and strict navigational ese events occurring highly unlikely and eration of mitigation measures, there will from the Proposed Development alone.

tential plans and projects and the ractice measures which could s predicted that there will be no adverse rith other plans and projects.

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#### 10.9. ALDERNEY WEST COAST AND BURHOU ISLANDS RAMSAR SITE

#### **OVERVIEW**

- 10.9.1.1. The Alderney West and Burhou Islands Ramsar site covers some 4.4 nm<sup>2</sup> of land and sea, almost twice the land area of mainland Alderney. The site comprises the western coast of Alderney and adjacent shallow waters and islets in the strongly tidal, high-energy system of the northern Channel Islands.
- 10.9.1.2. Large breeding seabird populations are present within the site, including the only storm petrel and gannet colonies in the Channel Islands. The gannet colony is established on the Garden Rocks (Les Etacs) and Ortac. At the time of designation in 2005, 5,950 breeding pairs were present, with 8,737 pairs present during the last count in 2015 (Copping *et al.*, 2018).
- 10.9.1.3. Other breeding seabird species are present in regionally, nationally and internationally important numbers, with most present on the Burhou Islands.

#### 10.9.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.9.2.1. Site-specific SACO is not available for the Alderney West Coast and Burhou Islands Ramsar site. As such, SACO available for the UK SPAs considered have been used as a basis for the assessment. Table 10-15 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

## Table 10.15 SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Gannet Storm petrel	Accidental spills and Litter	Supporting habitat: water quality - contaminants
Lesser black-backed gull		

## 10.9.2.2. Non-equivalent attributes listed within the SACO which were screened out from further assessment included:

- Breeding population: abundance;
- · Connectivity with supporting habitats;
- Disturbance caused by human activity;
- Predation all habitats;
- Supporting habitat: food availability;
- Supporting habitat: air quality;
- Supporting habitat: conservation measures;



- Supporting habitat: extent and distribution of supporting habitat for the breeding season;
- Supporting habitat: landform;
- Supporting habitat: vegetation characteristics for nesting;
- Supporting habitat: water quality turbidity;
- Supporting habitat: water quality DO; and
- 10.9.2.3. Supporting habitat: water quality nutrients.

#### ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.9.2.4. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10-16 below.
- 10.9.2.5. Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity, arising from either the Proposed Development alone, or in combination with other plans or projects, can be concluded for the Alderney West Coast and Burhou Islands Ramsar site.

Table 10-16 - Assessment of potential adverse effects on site integrity for the Alderney West and Burhou Islands Ramsar site across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Gannet	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from vessels me phases. Spills have the potential to directly affect pre through a range of biological effects. Unplanned dis all development phases also has the potential to affect entanglement. However, routine mitigation measures of standard be management, pollution prevention measures and st likelihood of these events occurring highly unlikely a consideration of mitigation measures, there will be re the Proposed Development alone. Given the scale and nature of other potential plans a adhere to similar best practice measures which cou- it is predicted that there will be no adverse effect on plans and projects.
Storm petrel	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from vessels maphases. Spills have the potential to directly affect prethrough a range of biological effects. Unplanned disa all development phases also has the potential to affect entanglement. However, routine mitigation measures waste management, pollution prevention measures make the likelihood of these events occurring highly that, in consideration of mitigation measures, there integrity from the Proposed Development alone. Given the scale and nature of other potential plans a adhere to similar best practice measures which could it is predicted that there will be no adverse effect on plans and projects.
Lesser black- backed gull	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from vessels maphases. Spills have the potential to directly affect prethrough a range of biological effects. Unplanned disa all development phases also has the potential to affect entanglement. However, routine mitigation measures waste management, pollution prevention measures make the likelihood of these events occurring highly that, in consideration of mitigation measures, there integrity from the Proposed Development alone. Given the scale and nature of other potential plans a adhere to similar best practice measures which coulit is predicted that there will be no adverse effect on plans and projects.



may occur during all development prey species within the water column isposal of industrial or user plastic during ffect prey species through ingestion or

best practice in terms of waste strict navigational protocols will make the and therefore it is predicted that, in no adverse effects on site integrity from

and projects and the requirement to uld contribute to in combination effects, on site integrity in combination with other

may occur during all development prey species within the water column isposal of industrial or user plastic during ffect prey species through ingestion or res of standard best practice in terms of s and strict navigational protocols will ly unlikely and therefore it is predicted will be no adverse effects on site

and projects and the requirement to uld contribute to in combination effects, on site integrity in combination with other

may occur during all development prey species within the water column isposal of industrial or user plastic during ffect prey species through ingestion or res of standard best practice in terms of s and strict navigational protocols will ly unlikely and therefore it is predicted will be no adverse effects on site

and projects and the requirement to uld contribute to in combination effects, on site integrity in combination with other

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment	
Conclusion, Following the application of standard best prostice mitigation measures, no significant adverse offect on site integrity can be concluded						

Conclusion: Following the application of standard best practice mitigation measures, no significant adverse effect on site integrity can be concluded for the Alderney West Coast and Burhou Islands Ramsar site, either from the Proposed Development alone, or in combination with other plans or projects.



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## 10.10. SOLENT MARITIME SAC

#### 10.10.1. **OVERVIEW**

10.10.1.1. The Solent Maritime SAC covers 113.25 km2 throughout the Solent as well as Langston Harbour and Chichester Harbour. The SAC overlaps with the Marine Cable Corridor for over an area of 163.4 m2 at the mouth of Langston Harbour. Designated features for which LSE could not be ruled out within this SAC were Estuaries [1130], Sandbanks which are slightly covered by sea water all the time [1110], and mudflats and sandflats not covered by seawater at low tide [1140], Spartina swards [1320], Atlantic salt meadows [1330], and Salicornia and other annuals colonising mud and sand [1310].

#### 10.10.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

- 10.10.2.1. Site-specific SACO is available for the Solent Maritime SAC<sup>42</sup>.
- 10.10.2.2. Table 10-17 lists those attributes which are considered to be relevant to those effects for which an LSE could not be excluded.

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https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030059&SiteName=sole nt&SiteNameDisplay=Solent+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&Nu mMarineSeasonality=0 Accessed October 2019

### Table 10-17 - SACO attributes screened in for assessment

Feature/Sub-feature	Effect for which LSE could not be excluded	Equivalent attribute
Estuaries	Increased suspended sediment concentration (SSC) Deposition of sediment (smothering)	Supporting Processes: water quality – DO Supporting Processes: water quality – nutrients Supporting Processes: water quality – turbidity Distribution: presence and spatial distribution of biological communities Structure: species composition of component communities Structure: substrate composition and distribution
Atlantic Salt Meadows Salicornia and other annuals colonising mud and sand Spartina swards	Increased suspended sediment concentration (SSC) Deposition of sediment (smothering)	Supporting processes: sedimentary processes Distribution of the feature, including associated transitional habitats, within the site Extent of the feature Future extent of habitat within the site and ability to respond to seasonal changes Structure and function (including its typical species): key structural, influential and distinctive species Structure and function: sediment size and availability Supporting processes: functional connectivity with wider coastal sedimentary system
Intertidal Course Sediment Intertidal mixed sediment Intertidal mud Intertidal sand and muddy sand	Increased suspended sediment concentration (SSC) Deposition of sediment (smothering)	Structure: sediment total organic carbon ('TOC') content Supporting processes: sediment movement and hydrodynamic regime Supporting Processes: water quality – DO Supporting Processes: water quality – nutrients Supporting Processes: water quality – turbidity Distribution: presence and spatial distribution of biological communities Structure: species composition of component communities Structure: substrate composition and distribution
Intertidal seagrass beds Subtidal seagrass beds	Increased suspended sediment concentration (SSC) Deposition of sediment (smothering)	Supporting processes: sedimentation rate Supporting Processes: water quality – DO Supporting Processes: water quality – nutrients Supporting Processes: water quality – turbidity Distribution: presences and spatial distribution of biological communities Structure: species composition of component communities Structure: substrate composition and distribution
Sandbanks which are slightly covered by seawater all the time. Subtidal course sediment Subtidal mixed sediment Subtidal sand	Increased suspended sediment concentration (SSC) Deposition of sediment (smothering)	Supporting processes: sediment movement and hydrodynamic regime Supporting Processes: water quality – DO Supporting Processes: water quality – nutrients Supporting Processes: water quality – turbidity Distribution: presences and spatial distribution of biological communities Structure: species composition of component communities Structure: substrate composition and distribution
Mudflats and sandflats not covered by seawater at low tide	Increased suspended sediment concentration (SSC) Deposition of sediment (smothering)	Supporting processes: sediment movement and hydrodynamic regime Supporting Processes: water quality – DO Supporting Processes: water quality – nutrients Supporting Processes: water quality – turbidity Distribution: presence and spatial distribution of biological communities Structure: species composition of component communities



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Feature/Sub-feature	Effect for which LSE could not be excluded	Equivalent attribute
Estuaries Mudflats and sandflats not covered by seawater at low tide Sandbanks which are slightly covered by seawater all the time. Subtidal seagrass beds Subtidal sand Subtidal mixed sediment Subtidal course sediment Intertidal seagrass beds Intertidal sand and muddy sand Intertidal mud Intertidal mixed sediment Intertidal course sediment Intertidal course sediment	Pollution	Supporting processes: sediment contaminant Supporting processes: water quality – contam
Spartina swards Salicornia and other annuals colonising mud and sand Atlantic salt meadows	Pollution	Supporting processes: water quality
Estuaries Mudflats and sandflats not covered by seawater at low tide Sandbanks which are slightly covered by seawater all the time. Subtidal seagrass beds Subtidal sand Subtidal mixed sediment Subtidal course sediment Intertidal seagrass beds Intertidal sand and muddy sand Intertidal mud Intertidal mixed sediment Intertidal course sediment	Invasive species	Structure: non-native species and pathogens
Spartina swards Salicornia and other annuals colonising mud and sand Atlantic salt meadows	Invasive species	Structure and function: vegetation – undesira



ts minants	
3	
able species	

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- 10.10.2.3. All other attribute/receptor combinations present within the SACO for this SAC were deemed to not be relevant to the effects screened in to the AA.
- 10.10.2.4. The assessment for potential adverse effects on integrity for the Solent Maritime SAC (Table 10-18) is undertaken on all relevant sub-features, noting that the same sub-features may be present in more than one qualifying feature of the site. The Conservation Objectives, targets and attributes of each sub-feature are the same across all qualifying features. It is noted that Salicornia and other annuals colonising mud and sand, *Spartina* swards, and Atlantic salt meadows are qualifying features as well as being sub-features of the Estuary qualifying feature. Where qualifying features are also sub-features, the conservation objectives, attributes and targets are the same whether at a sub-feature or qualifying feature level.

#### 10.10.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.10.3.1. For those designated features where LSE could not be excluded in Section 7, an assessment of potential adverse effects on site integrity is presented in Table 10-18 below.
- 10.10.3.2. It is concluded that there will be no adverse effects on site integrity for the Solent Maritime SAC, either from the Proposed Development alone, or in combination with other plans or projects, following the application of mitigation.

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
Estuaries	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adversed result of invasive species.
The structure and function (including typical species) of qualifying natural habitats The structure and	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the feature (or its sub-features).	Unplanned oil or chemical spillages from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity. Given the scale and nature of other po	
	function of the habitats of the qualifying species The supporting processes on which qualifying natural habitats and the	Pollution	Supporting Processes: water quality – contaminants	Reduce aqueous contaminants to levels equating to High/Good Status (according to Annex VIII and X of the WFD), avoiding deterioration from existing levels.	requirement to adhere to similar best p in combination effects, it is predicted th integrity in combination with other plan
	habitats of qualifying species rely The populations of each of the qualifying species The distribution of	Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\ge$ 5.7 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at t between increased SSC / sediment plu disposal of dredge material. For activities other than the deposition activities which will lead to increased S HDD pit(s) (between KP1 and KP1.6),

Table 10-18 - Assessment of potential adverse effects on site integrity for the Solent Maritime SAC across all phases of the Proposed Development



procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure rse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is lverse effects will arise on this feature as a

rom vessels may occur during all ne mitigation measures of standard best ent, pollution prevention measures (Section ols will make the likelihood of these events e will not result in adverse effects on Site

potential plans and projects and the practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD s of sediment plume dispersion modelling this distance, there will be no connectivity olumes and the SAC resulting from the

n of dredged material, the worst-case SSC are considered to be excavation at the , and cable installation (due to the potential

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	qualifying species within the site	Increased SSC	Supporting Processes: water quality – nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	for the liberation and dispersal of fines other isolated locations). It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours foll Sediment plumes are also likely to be or pit at which point concentrations of a to return to background levels within a activities. The finest sediments will potentially be area, however it is highly likely that SS
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	and therefore not discernible above na Natural Variation ranges from approximannual averages of between 5 – 15 m
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	The mouth of Langstone harbour (the approximately 1 km from the proposed location). SSC variability within the har frequent exposure to storm induced flu 2017). Suspended sediments within La
		Increased SSC	Supporting Processes: water quality – turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	200 mgl <sup>-1</sup> , while measured SSC in ner mgl <sup>-1</sup> (Portsmouth) (Humby and Duni 2017). The Estuary qualifying features prese which are not considered overly sens assessments below), are therefore li- levels of increased SSC, which will of considered that there will be no adver SSC on Estuary features. Nosignification or nutrients are predicted following ca- inorganic nitrogen levels are predicted Considering the very small and localit the general lack of sensitivity to the i- which may result in in combination er- and magnitude, it is considered that the integrity from in combination increase



es identified between KP 5 and 15, and in

to 200 mgl<sup>-1</sup> may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. the transported up to 5 km away from the trench of 5 to 10 mgl<sup>-1</sup> are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SCs at these distances will be low (< 5 mgl<sup>-1</sup>) natural variation.

kimately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible arbour is high, owing to its tidal nature and fluctuations (New Forest District Council, Langstone harbour have been measured at earby harbours have been recorded up to 100 n, 1975 – cited in New Forest District Council,

ent within the SAC, many of the habitats of sitive to this pressure (see sub-feature kely to be highly tolerant of the predicted inly persist for a short duration. Therefore, it is erse effects on site integrity from increased ant effect on the natural levels of turbidity, DO, essation of the activity, and no effects on ed.

sed effects predicted by the proposed work, mpact, and the fact that all other activities ffects are likely to be similar or lesser in extent there will be no adverse effects on site es in SSC.

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment	
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km); which e Marine Cable Corridor. Results of sedi 6.2 of ES) indicate that, at this distance	
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	the SAC resulting from dredge disposa Deposition from other cable installation between KP1 and KP1.6) is not predic material mobilised deposited rapidly (i.	
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	cable trench). Finer sediment will be of transiently depositing throughout the to of sediment likely to be liberated into to fine sediment, it is considered that dep quickly resuspended and redistributed	
					The mouth of Langstone harbour (the approximately 1 km from the proposed location), and therefore it is considered majority of sediment is deposited.	
					Therefore, any deposition of sediment not adversely affect the integrity of the which are not sensitive to effects at thi sediment and water movement, or sed	
					Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sime considered that there will not be an ad combination deposition of sediment (se	
Atlantic Salt Meadows (Glauco- Puccinellietalia)	Maintaining or restoring: The extent and distribution of	Invasive species	Structure and function: vegetation - undesirable species	The frequency / cover of the following undesirable species are maintained at acceptable levels and are not encouraged by	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species.	
	distribution of qualifying natural habitats and habitats of the qualifying species		changes in surface condition, soils, nutrient levels or changes to hydrology: Spartina	Due to the lack of predicted effects, all practice measures employed for any o		



iment disposal activities to outwith WFD equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix nce, there will be no sediment deposition with sal activities.

on activities (including excavation of HDD pits licted to be significant, with any coarse (i.e. within several hundred metres of the dispersed across a greater spatial extent, tidal cycle. However, due to the low volumes the water column and significant dispersion of eposition will be negligible with sediments ed under the forcing of tidal flows.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible ed that it will be outwith the area where the

nt will be 'light', temporary in nature and will ne Estuary feature, most of the habitats of his level. No significant effects on normal ediment composition are predicted.

ised effects predicted to result from the that all other activities which may result in in imilar or lesser in extent and magnitude, it is adverse effect on site integrity from in (smothering).

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	The structure and function (including typical species) of qualifying natural habitatsThe structure and function of the habitats of the 			anglica, Phragmites australis.	considered that no in combination advertised that no in combination advertised feature as a result of invasive species.
		Increased SSC	Distribution of the feature, including associated transitional habitats, within the site	Maintain the range and continuity of the habitat and its natural transitions within saltmarsh types and to other habitats seaward and landward.	<ul> <li>Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this disincreased SSC / sediment plumes with For activities other than the deposition activities which will lead to increased S HDD pits, and cable installation (due to fines identified between KP 5 and 1 lt is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours for Sediment plumes are also likely to be or pit at which point concentrations of to return to background levels within a activities.</li> <li>The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above national averages of between 5 – 15 m.</li> </ul>
		Increased SSC	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	
		Increased SSC	Future extent of habitat within the site and ability to respond to seasonal changes	Maintain the ability to achieve long-term fluctuations in the extent of habitat in response to coastal processes.	
		Increased SSC	Structure and function (including its typical species): key structural, influential and distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature	
	Increased SSC	Structure and function: sediment size and availability	Maintain the availability and size range of those sediments typical of the feature at the site.	<ul> <li>The mouth of Langstone harbour (the approximately 1 km from the propose location), and the closest areas of sa from the entrance.</li> <li>SSC variability within the harbour is herbour is herbour is herbour.</li> </ul>	
		Increased SSC	Supporting Processes: functional connectivity with wider coastal sedimentary system	Maintain adequate inputs of sediment in the water column from the sediment sources	exposure to storm induced fluctuations Suspended sediments within Langston 1, while measured SSC in nearby harb (Portsmouth) (Humby and Dunn, 1975 2017).



dverse effects on site integrity will arise on this es.

iment disposal activities to outwith WFD is of sediment plume dispersion modelling listance, there will be no connectivity for ith the SAC.

on of dredged material, the worst-case SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

to 200 mgl-1 may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. te transported up to 5 km away from the trench of 5 to 10 mgl-1 are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl-1) natural variation.

ximately <5 to 75 mgl-1 in coastal areas, with mgl-1 observed within surface waters.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible altmarsh habitat is located a further kilometre

high, owing to its tidal nature and frequent ns (New Forest District Council, 2017). one harbour have been measured at 200 mglrbours have been recorded up to 100 mgl-1 75 – cited in New Forest District Council,

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				(offshore / eroding cliffs, etc).	Saltmarsh plants are tolerant of a deturbidity. It is recognised that turbidit however the plants photosynthesise covered at high tides, so that the turn species covered by high tide, that excompensate when exposed to air an slight increases in SSC as predicted considered unlikely to affect the grow within the Solent Maritime SAC and No effect on the natural levels of turb activity, and no significant effects on feature to transition or fluctuate in exposed to are solved.
					Considering the very small and localise Development, the general lack of sense other activities which may result in in or lesser in extent and magnitude, it is con- effects on site integrity as a result of in- combination with other plans and project
		Deposition of sediment	Supporting Processes: sedimentary Processes	Maintain the sedimentary processes (suspended sediment, sediment transfer, etc) that sustain the elevation and topography of the marsh surface.	Mitigation is proposed to restrict sedin waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis sediment deposition with the SAC. Deposition from other cable installation is not predicted to be significant with a rapidly (i.e. within several hundred me
		Deposition of Sediment (Smothering)	Distribution of the feature, including associated transitional habitats, within the site	Maintain the range and continuity of the habitat and its natural transitions within saltmarsh types and to other habitats seaward and landward.	be dispersed across a greater spatial e tidal cycle. However, due to the volume water column and significant dispersio deposition will be negligible with sedim under the forcing of tidal flows. The mouth of Langstone harbour (the approximately 1 km from the proposed
		Deposition of Sediment (Smothering)	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	location), and the closest areas of sa from the entrance. Therefore, any d within the natural variation of the sec



gree of increased SSC, and the resulting ty reduces the light attenuation through water, at low tide and are probably not completely bidity of the water is probably not relevant. Any perience reduced photosynthesis, will be able d low tides (Tyler Walters, 2004). Therefore, to arise from the Proposed Development are with or distribution of Atlantic salt meadows no adverse effects on integrity are predicted. bidity are predicted following cessation of the sediment composition or the ability of this tent are predicted.

sed effects predicted for the Proposed nsitivity to the impact, and the fact that all combination effects are likely to be similar or considered that there will be no adverse increases in SSC, either alone or in jects.

ment disposal activities to outwith WFD s of sediment plume dispersion modelling listance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited etres of the cable trench). Finer sediment will I extent, transiently depositing throughout the nes of sediment likely to be liberated into the ion of fine sediment, it is considered that ments quickly resuspended and redistributed

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible Itmarsh habitat is located a further kilometre eposition of sediment will be light, and likely iment regime present in the area. Saltmarsh

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of Sediment (Smothering)	Future extent of habitat within the site and ability to respond to seasonal changes	Maintain the ability to achieve long-term fluctuations in the extent of habitat in response to coastal processes.	plants are adapted to accreting enviro by smothering events for up to a mont Considering the very small and localis Proposed Development, and the fact to combination effects are likely to be sir
		Deposition of Sediment (Smothering)	Structure and function (including its typical species): key structural, influential and distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature	considered that there will be no adve combination deposition of sediment ( sediment and water movement, or se effects on habitat connectivity or their Therefore, due to the negligible levels the fact that any material is likely to b conditions, it is considered that sedin Development will not adversely affect considered that this feature will be ou is deposited.
		Deposition of Sediment (Smothering)	Structure and function: sediment size and availability	Maintain the availability and size range of those sediments typical of the feature at the site.	
		Deposition of Sediment (Smothering)	Supporting Processes: functional connectivity with wider coastal sedimentary system	Maintain adequate inputs of sediment in the water column from the sediment sources (offshore / eroding cliffs, etc).	
		Pollution	Supporting Processes: water quality	Where the feature is dependent on estuarine water, ensure water quality and quantity is restored to a standard that provides the	Unplanned oil or chemical spillages from development phases. However, routing practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity as a result from the Proposed
				necessary conditions to support the feature.	Given the scale and nature of other per requirement to adhere to similar best in combination effects, it is predicted t integrity in combination with other plan
Intertidal Course Sediment	Maintaining or restoring:	Invasive species	Structure: non-native species and pathogens	Restrict the introduction and spread of non-native	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far



onments and may not be adversely affected nth (Tyler-Walters, 2004).

ised effects predicted to result from the t that all other activities which may result in in similar or lesser in extent and magnitude, it is erse effects on site integrity from in (smothering). No significant effects on normal ediment composition are predicted, and no ir ability to transition are predicted.

Is of sediment predicted to be deposited, and be redistributed through normal tidal ment deposition from the Proposed of the integrity of the feature. Therefore, it is utwith the area where the majority of sediment

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on site ed Development alone.

cotential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	The extent and distribution of qualifying natural habitats and habitats of the qualifying speciesThe structure and function (including 			species and pathogens, and their impacts.	that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adverses.
		Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold. For example, mean cadmium levels should be maintained below the ERL of 1.2 mg per kg.	Unplanned oil or chemical spillages from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity as a result from the Proposed Given the scale and nature of other por requirement to adhere to similar best p in combination effects, it is predicted the integrity in combination with other plan
qualifying natural habitats and the habitats of qualifying species rely The populations of each of the qualifying species	Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.		
	The distribution of qualifying species within the site	Deposition of sediment	Supporting Processes: sediment movement and hydrodynamic regime	Maintain sediment transport pathways to and from the feature to ensure replenishment of habitats that rely on the sediment supply.	The Natural England Advice on Opera sensitive to increase in SSC or deposi operation or decommissioning. Therefor for adverse effects on integrity to arise feature.



erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on site ed Development alone.

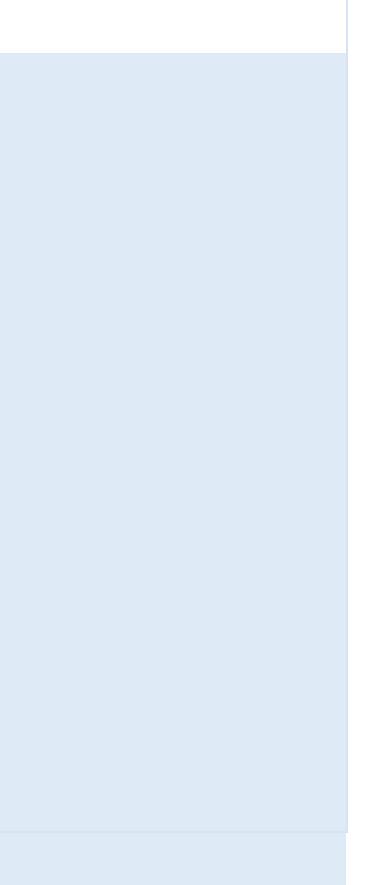
potential plans and projects and the t practice measures which could contribute to I that there will be no adverse effect on site ans and projects.

rations package lists this sub-feature as not osition of sediment at any stage of construction, efore, it is considered that there is no potential se as a result of such effects on this sub-

WSP/Natural Power

Feature/Sub-features	Conservation Objective	Effect	Attribute	Target	
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	
		Increased SSC	Structure: sediment TOC content	Maintain the TOC content in the sediment at existing levels.	
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\geq$ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms)	





Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				do not affect the integrity of the site and features.	
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	
Intertidal Mixed sediment	Maintaining or restoring: The extent and distribution of	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vess introduction of INIS introduction as for that there are is no potential for adver- of invasive species from the Propos
	qualifying natural habitats and habitats of the qualifying species				Due to the lack of predicted effects, practice measures employed for any considered that no in combination a result of invasive species.
	The structure and function (including typical species) of qualifying natural habitats	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria	Unplanned oil or chemical spillages development phases. However, rout practice in terms of waste managem 10.2.5) and strict navigational protoco occurring highly unlikely and therefor integrity from the Proposed Develop



and procedures (see section 10.2.5) will be sels. This will reduce the potential for s far as is reasonably practicable and will ensure liverse effects on integrity on the site as a result osed Development alone.

s, along with the application of any similar best ny other plan and project identified, it is adverse effects will arise on this feature as a

s from vessels may occur during all utine mitigation measures of standard best ment, pollution prevention measures (Section ocols will make the likelihood of these events fore will not result in adverse effects on site opment alone.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	The structure and function of the habitats of the qualifying species			(EAC) or Effects Range Low (ERL) threshold. For example, mean cadmium levels should be maintained below the ERL of 1.2 mg per kg.	Given the scale and nature of other por requirement to adhere to similar best point combination effects, it is predicted the integrity in combination with other plan
	The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The populations of each of the qualifying	Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
	species The distribution of qualifying species within the site	Deposition of Sediment (Smothering)	Supporting Processes: sediment movement and hydrodynamic regime	Maintain sediment transport pathways to and from the feature to ensure the replenishment of habitats that are reliant on the sediment supply.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km); which e Marine Cable Corridor. Results of sedi 6.2 of ES) indicate that, at this distance the SAC resulting from dredge disposa Deposition from other cable installation between KP1 and KP1.6) is not predic material mobilised deposited rapidly (i. cable trench). Finer sediment will be di transiently depositing throughout the ti of sediment likely to be liberated into the fine sediment, it is considered that dep quickly resuspended and redistributed The mouth of Langstone harbour (the within which mudflat features exist) is a entry/exit pits (at their closest possible it will be outwith the area where the ma The highly limited magnitude and temp predicted, along with the ability of mos or recover quickly (days-weeks) from li 2018) ensures that any deposition of s
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	



ootential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix nce, there will be no sediment deposition with sal activities.

on activities (including excavation of HDD pits licted to be significant, with any coarse (i.e. within several hundred metres of the dispersed across a greater spatial extent, tidal cycle. However, due to the low volumes the water column and significant dispersion of eposition will be negligible with sediments ed under the forcing of tidal flows.

e closest Estuary feature within the SAC, s approximately 1 km from the proposed HDD le location), and therefore it is considered that majority of sediment is deposited.

nporary nature of the deposition of sediments ost species present in such habitats to survive a light smothering events (Tillin and Ashley, sediment will not adversely affect the integrity

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
					of the sub-feature. No significant effec or sediment composition are predicted
					Considering the very small and localis Proposed Development, the general la activities which may result in in combin in extent and magnitude, it is consider site integrity from in combination depo- from the Proposed Development and
		Increased SSC	Structure: sediment TOC content	Maintain TOC content in the sediment at existing levels.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at t
		Increased SSC	Supporting Processes: water quality - DO	Maintain DO concentration at levels equating to High Ecological Status (specifically $\geq$ 5.7 mg L-1 (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	between increased SSC / sediment plu disposal of dredge material. For activities other than the deposition activities which will lead to increased S HDD pit(s) (between KP1 and KP1.6), for the liberation and dispersal of fines other isolated locations). It is predicted observed locally (i.e. within 2 km of the concentrations could potentially persis
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	construction activities. Sediment plume km away from the trench or pit at whic predicted. SSC is expected to return to following completion of these activities transported up to 6-10 km in the nears SSCs at these distances will be low (< natural variation. Natural Variation ranges from approxin annual averages of between 5 – 15 m The mouth of Langstone harbour (the approximately 1 km from the proposed
			Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.



ects on normal sediment and water movement, ed.

ised effects predicted to result from the lack of sensitivity, and the fact that all other bination effects are likely to be similar or lesser ered that there will be no adverse effects on bosition of sediment (smothering) resulting d other project and plans.

iment disposal activities to outwith WFD is of sediment plume dispersion modelling t this distance, there will be no connectivity plumes and the SAC resulting from the

on of dredged material, the worst-case SSC are considered to be excavation at the ), and cable installation (due to the potential es identified between KP 5 and 15, and in ed that peak SSCs of up to 200 mgl<sup>-1</sup> may be he cable trench or HDD pit) and these ist for several hours following completion of mes are also likely to be transported up to 5 ich point concentrations of 5 to 10 mgl<sup>-1</sup> are to background levels within a few days es. The finest sediments will potentially be rshore area, however it is highly likely that (< 5 mgl<sup>-1</sup>) and therefore not discernible above

kimately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible arbour is high, owing to its tidal nature and fluctuations (New Forest District Council, Langstone harbour have been measured at earby harbours have been recorded up to 100

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	mgl <sup>-1</sup> (Portsmouth) (Humby and Dunn, 2017). According to in the Advice on Operation considered sensitive to nutrients or org
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	present in these littoral mixed sediment sediment loading, being in the main bu- sediments with a high degree of fine se immersion by tides (Tillin and Ashley, 2 increased SSC, which will only persist normal levels are not considered to lea effect on the natural levels of turbidity, cessation of the activity, and no effects Considering the very small and localise Development, the general lack of sens activities which may result in in combin in extent and magnitude, it is considered site integrity from in combination increase
Intertidal Mud	Maintaining or restoring: The extent and distribution of	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species.
	qualifying natural habitats and habitats of the qualifying species				Due to the lack of predicted effects, all practice measures employed for any o considered that no in combination adver result of invasive species.
	The structure and function (including	Increased SSC	Structure: sediment TOC content	Maintain TOC content in the sediment at existing levels.	The Natural England Advice on Opera assessment of this pressure on this fea pressure is not relevant to this feature.



n, 1975 – cited in New Forest District Council,

tions for this SAC, this sub feature is not organic content. Furthermore, the species ents are typically highly tolerant of increased burrowing species with a preference for sediments which are mobilised readily on v, 2018). Therefore, the predicted levels of st for a short duration before returning to ead to adverse effects on site integrity. No y, DO, or nutrients are predicted following cts on TOC levels are predicted.

ised effects predicted by the Proposed insitivity to the effect, and the fact that all other pination effects are likely to be similar or lesser ered that there will be no adverse effects on reases in SSC.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

rations package does not include an feature. Therefore, it is considered that this e.

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	typical species) of qualifying natural habitats The structure and function of the habitats of the qualifying species The supporting processes on which qualifying natural habitats and the	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold. For example, mean cadmium levels should be maintained below the ERL of 1.2 mg per kg.	Unplanned oil or chemical spillages from development phases. However, routing practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity as a result from the Proposed Given the scale and nature of other por requirement to adhere to similar best p in combination effects, it is predicted the integrity in combination with other plan
habitats and the habitats of qualifying species rely The populations of each of the qualifying species The distribution of qualifying species within the site	habitats of qualifying species rely The populations of each of the qualifying species	Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
	Deposition of sediment	Supporting Processes: sediment movement and hydrodynamic regime	Maintain sediment transport pathways to and from the feature to ensure replenishment of habitats that rely on the sediment supply.	Mitigation is proposed to restrict sed waters (plus a buffer of 3 km); which Marine Cable Corridor. Results of se 6.2 of ES) indicate that, at this distant the SAC resulting from dredge dispo Deposition from other cable installation	
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	between KP1 and KP1.6) is not predic material mobilised deposited rapidly (i cable trench). Finer sediment will be d transiently depositing throughout the t
			Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.



from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on site ed Development.

cotential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD equates to disposal seaward of KP21 of the ediment plume dispersion modelling (Appendix nce, there will be no sediment deposition with osal activities.

on activities (including excavation of HDD pits licted to be significant, with any coarse (i.e. within several hundred metres of the dispersed across a greater spatial extent, tidal cycle. However, due to the low volumes the water column and significant dispersion of eposition will be negligible with sediments ed under the forcing of tidal flows.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	The mouth of Langstone harbour (the within which mudflat features exist) is a entry/exit pits (at their closest possible it will be outwith the area where the matching the highly limited magnitude and temp predicted, along with the ability of most or recover quickly (days-weeks) lights that any deposition of sediment will not feature. No significants effects on norm sediment composition are predicted. Considering the very small and localise Proposed Development, the general la activities which may result in in combine in extent and magnitude, it is considered effects on site integrity from in combine with other project and plans.
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\geq$ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at the between increased SSC / sediment plus disposal of dredge material. For activities other than the deposition activities which will lead to increased S HDD pit(s) (between KP1 and KP1.6), for the liberation and dispersal of fines
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms)	other isolated locations). It is predicted observed locally (i.e. within 2 km of the concentrations could potentially persist construction activities. Sediment plume km away from the trench or pit at which predicted. SSC is expected to return to following completion of these activities transported up to 6-10 km in the nears



a closest Estuary feature within the SAC, a approximately 1 km from the proposed HDD e location), and therefore it is considered that majority of sediment is deposited.

st species present in such habitats to survive smothering events (Ashley, 2016) ensures ot adversely affect the integrity of the submal sediment and water movement, or

sed effects predicted to result from the lack of sensitivity, and the fact that all other ination effects are likely to be similar or lesser red that there is no potential for adverse nation deposition of sediment (smothering),

ment disposal activities to outwith WFD s of sediment plume dispersion modelling this distance, there will be no connectivity lumes and the SAC resulting from the

n of dredged material, the worst-case SSC are considered to be excavation at the a, and cable installation (due to the potential is identified between KP 5 and 15, and in ad that peak SSCs of up to 200 mgl<sup>-1</sup> may be are cable trench or HDD pit) and these st for several hours following completion of thes are also likely to be transported up to 5 ch point concentrations of 5 to 10 mgl<sup>-1</sup> are to background levels within a few days s. The finest sediments will potentially be shore area, however it is highly likely that

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				do not affect the integrity of the site and features.	SSCs at these distances will be low (< natural variation. Natural Variation ranges from approxi annual averages of between 5 – 15 m
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	The mouth of Langstone harbour (the approximately 1 km from the proposed location). SSC variability within the har frequent exposure to storm induced flu 2017). Suspended sediments within L
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	<ul> <li>200 mgl<sup>-1</sup>, while measured SSC in near mgl<sup>-1</sup> (Portsmouth) (Humby and Dunn, 2017).</li> <li>According to in the Advice on Operation considered sensitive to nutrients or or</li> </ul>
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	
					Considering the very small and localis Proposed Development, the general la that all other activities which may resu similar or lesser in extent and magnitu adverse effects on site integrity from i
Intertidal sand and muddy sand	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any of



(< 5 mgl<sup>-1</sup>) and therefore not discernible above

ximately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible harbour is high, owing to its tidal nature and fluctuations (New Forest District Council, Langstone harbour have been measured at earby harbours have been recorded up to 100 n, 1975 – cited in New Forest District Council,

tions for this SAC this sub feature is not organic content. Furthermore, the species ents are typically highly tolerant of increased burrowing species with a preference for sediments which are mobilised readily on Therefore, the predicted levels of increased ort duration before returning to normal levels e effects on site integrity. No effect on the rients are predicted following cessation of the

ised impacts predicted to result from the lack of sensitivity to the effect, and the fact sult in in combination effects are likely to be tude, it is considered that there will be no in combination increases in SSC.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	of the qualifying species				considered that no in combination adverters
	The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of the qualifying species	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold. For example, mean cadmium levels should be maintained below the ERL of 1.2 mg per kg.	Unplanned oil or chemical spillages fro development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocols occurring highly unlikely and therefore integrity as a result of the Proposed De Given the scale and nature of other por requirement to adhere to similar best p in combination effects, it is predicted the integrity in combination with other plane
	The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The populations of each of the qualifying	Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
species The distribution of qualifying species within the site	Deposition of sediment	Supporting Processes: sediment movement and hydrodynamic regime	Maintain sediment transport pathways to and from the feature to ensure the replenishment of habitats that rely on the sediment supply.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km); which en Marine Cable Corridor. Results of sedi 6.2 of ES) indicate that, at this distance the SAC resulting from dredge dispose Deposition from other cable installation between KP1 and KP1.6) is not predict	
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	material mobilised deposited rapidly (i cable trench). Finer sediment will be d transiently depositing throughout the t of sediment likely to be liberated into t



lverse effects will arise on this feature as a

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on site Development alone.

cotential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD equates to disposal seaward of KP21 of the ediment plume dispersion modelling (Appendix nce, there will be no sediment deposition with osal activities.

on activities (including excavation of HDD pits licted to be significant, with any coarse (i.e. within several hundred metres of the dispersed across a greater spatial extent, tidal cycle. However, due to the low volumes the water column and significant dispersion of

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	fine sediment, it is considered that dep quickly resuspended and redistributed The mouth of Langstone harbour (the within which mudflat features exist) is a
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	entry/exit pits (at their closest possible it will be outwith the area where the m The highly limited magnitude and tem predicted, along with the ability of more or recover quickly from light smothering ensures that any deposition of sedime sub-feature. No effects on the normal significant changes to sediment struct Considering the very small and localits Proposed Development, the general I activities which may result in in combin in extent and magnitude, it is consider site integrity from in combination depo
		water quality - DO concentratiequating to equating to Ecological (specifical (at 35 salii) of the yeal deterioration	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\geq$ 5.7 mg L-1 (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at th between increased SSC / sediment plu disposal of dredge material. For activities other than the deposition activities which will lead to increased S HDD pit(s) (between KP1 and KP1.6), for the liberation and dispersal of fines	
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms)	other isolated locations). It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours foll Sediment plumes are also likely to be to or pit at which point concentrations of s to return to background levels within a activities.



eposition will be negligible with sediments d under the forcing of tidal flows.

e closest Estuary feature within the SAC, s approximately 1 km from the proposed HDD e location), and therefore it is considered that najority of sediment is deposited.

nporary nature of the deposition of sediments ost species present in such habitats to survive ng events (Tyler-Walters and Marshall, 2006) ent will not adversely affect the integrity of the I sediment pathways are predicted, and no sture or composition is predicted.

sed effects predicted to result from the lack of sensitivity, and the fact that all other pination effects are likely to be similar or lesser ered that there will be no adverse effects on position of sediment (smothering).

ment disposal activities to outwith WFD s of sediment plume dispersion modelling this distance, there will be no connectivity plumes and the SAC resulting from the

on of dredged material, the worst-case SSC are considered to be excavation at the ), and cable installation (due to the potential es identified between KP 5 and 15, and in

to 200 mgl<sup>-1</sup> may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. e transported up to 5 km away from the trench of 5 to 10 mgl<sup>-1</sup> are predicted. SSC is expected a few days following completion of these

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				do not affect the integrity of the site and features.	The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na Natural Variation ranges from approxi
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	annual averages of between 5 – 15 m The mouth of Langstone harbour (the approximately 1 km from the proposed location). SSC variability within the ha frequent exposure to storm induced flu
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	2017). Suspended sediments within L 200 mgl <sup>-1</sup> , while measured SSC in nea mgl <sup>-1</sup> (Portsmouth) (Humby and Dunn, 2017).
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	According to in the Advice on Operation considered sensitive to nutrients. Furth mixed sediments are typically highly to in the main burrowing species with a pro- of fine sediments which are mobilised and marshall, 2006). Therefore, the pro- only persist for a short duration before considered to lead to adverse effects
		Increased SSC	Structure: sediment TOC content	Maintain TOC content in the sediment at existing levels.	of turbidity is predicted following cess to the organic content of the sediment Considering the very small and localis Proposed Development, the general la that all other activities which may resu similar or lesser in extent and magnitu for adverse effects on site integrity fro
Intertidal seagrass beds	Maintaining or restoring: The extent and distribution of	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for adver- of invasive species.



be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl<sup>-1</sup>) natural variation.

ximately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible harbour is high, owing to its tidal nature and fluctuations (New Forest District Council, Langstone harbour have been measured at earby harbours have been recorded up to 100 n, 1975 – cited in New Forest District Council,

tions for this SAC ,this sub feature is not rthermore, the species present in these littoral tolerant of increased sediment loading, being a preference for sediments with a high degree of readily on immersion by tides (Tyler-walters predicted levels of increased SSC, which will re returning to normal levels are not s on site integrity. No effect on the natural level sation of the activity, and no significant change nts or inorganic nitrogen levels are predicted.

ised effects predicted as a result of the lack of sensitivity to the effect, and the fact sult in in combination effects are likely to be tude, it is considered that there is no potential om in combination increases in SSC.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	qualifying natural habitats and habitats of the qualifying species				Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adv result of invasive species.
	The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of the qualifying species The supporting	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold. For example, mean cadmium levels should be maintained below the ERL of 1.2 mg per kg.	Unplanned oil or chemical spillages from development phases. However, routing practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity. Given the scale and nature of other poor requirement to adhere to similar best point in combination effects, it is predicted the integrity in combination with other plan
	processes on which qualifying natural habitats and the habitats of qualifying species rely The populations of each of the qualifying	Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
	species The distribution of	Deposition of sediment	Supporting Processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km); which e
	qualifying species within the site	Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Marine Cable Corridor. Results of sed 6.2 of ES) indicate that, at this distanc the SAC resulting from dredge dispos
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	Deposition from other cable installation between KP1 and KP1.6) is not predic material mobilised deposited rapidly (i cable trench). Finer sediment will be d



along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on Site

potential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD equates to disposal seaward of KP21 of the ediment plume dispersion modelling (Appendix nce, there will be no sediment deposition with osal activities.

on activities (including excavation of HDD pits dicted to be significant, with any coarse (i.e. within several hundred metres of the dispersed across a greater spatial extent,

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	transiently depositing throughout the till of sediment likely to be liberated into the fine sediment, it is considered that dep quickly resuspended and redistributed. The mouth of Langstone harbour (the containing this sub-feature) is approximentry/exit pits (at their closest possible it will be outwith the area where the mat Therefore, any deposition of sediment not adversely affect the integrity of the within an area of natural sediment accur deposition predicted. No significant effer movement, or sediment composition a Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sim
					considered that there will be no advers combination effects of deposition of se
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	For activities other than the deposition activities which will lead to increased S
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of	HDD pit(s) (between KP1 and KP1.6), for the liberation and dispersal of fines other isolated locations).



tidal cycle. However, due to the low volumes the water column and significant dispersion of position will be negligible with sediments d under the forcing of tidal flows.

e closest Estuary feature within the SAC imately 1 km from the proposed HDD e location), and therefore it is considered that najority of sediment is deposited.

at will be 'light', temporary in nature and will e sub-feature, which due to its presence cretion will be tolerant of the very low levels of ffects on normal sediment and water are predicted.

sed effects predicted to result from the that all other activities which may result in in milar or lesser in extent and magnitude, it is rse effects on site integrity from in rediment (smothering).

ment disposal activities to outwith WFD s of sediment plume dispersion modelling this distance, there will be no connectivity lumes and the SAC resulting from the

n of dredged material, the worst-case SSC are considered to be excavation at the ), and cable installation (due to the potential s identified between KP 5 and 15, and in

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours foll Sediment plumes are also likely to be or pit at which point concentrations of s to return to background levels within a
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	activities. The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	Natural Variation ranges from approximannual averages of between 5 – 15 mg The mouth of Langstone harbour (the
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	which this sub-feature is present) is ap entry/exit pits (at their closest possible is high, owing to its tidal nature and free fluctuations (New Forest District Counce Langstone harbour have been measur nearby harbours have been recorded of Dunn, 1975 – cited in New Forest Dist
					Seagrass beds, although not tolerant to (due to a reduction in photosynthesis a to potentially be tolerant to such short experienced as a result of the Propose Seagrass beds are also located over a and as such are unlikely to be affected levels likely well within normal backgro experienced in this environment. Littors during periods of exposure. No change distribution are therefore considered like Development. In addition, according to ,this sub feature is not considered sens predicted levels of increased SSC, whi



to 200 mgl<sup>-1</sup> may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. e transported up to 5 km away from the trench of 5 to 10 mgl<sup>-1</sup> are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl<sup>-1</sup>) natural variation.

kimately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

e closest Estuary feature within the SAC within approximately 1 km from the proposed HDD le location). SSC variability within the harbour requent exposure to storm induced ncil, 2017). Suspended sediments within ured at 200 mgl<sup>-1</sup>, while measured SSC in d up to 100 mgl<sup>-1</sup> (Portsmouth) (Humby and strict Council, 2017).

to very high or long term increases in SSC and reduced oxygen levels), are considered t term isolated events as would be sed Development (D'Avack, et al., 2019a). a kilometre from the mouth of the harbour ed by very high levels of SSC with received round levels, and lower than peak levels oral beds are also able to photosynthesise ges to littoral seagrass bed function or likely to arise as a result of the Proposed to in the Advice on Operations for this SAC ensitive to deoxygenation. Therefore, the hich will only persist for a short duration

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
					before returning to normal levels are normal integrity. No significant effect on the following cessation of the activity, and predicted. Considering the very small and localise Proposed Development, the general levels that all other activities which may result similar or lesser in extent and magnitude adverse effects on site integrity from in
other annuals colonising mud and sand	<ul> <li>Maintaining or restoring:</li> <li>The extent and distribution of qualifying natural habitats and habitats of the qualifying species</li> <li>The structure and function (including typical species) of qualifying natural habitats</li> <li>The structure and function of the habitats</li> <li>The structure and function of the habitats of the qualifying natural habitats</li> </ul>	Invasive Species	Structure and function: vegetation - undesirable species	The frequency / cover of the following undesirable species are maintained at acceptable levels and are not encouraged by changes in surface condition, soils, nutrient levels or changes to hydrology: Spartina anglica.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species from the Proposed Due to the lack of predicted effects, all practice measures employed for any o considered that no in combination adve result of invasive species.
		Increased SSC	Supporting Processes: water quality	Where the feature is dependent on estuarine water, ensure water quality and quantity is restored to a standard that provides the necessary conditions to support the feature.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis increased SSC and the SAC. For activities other than the deposition activities which will lead to increased S HDD pits, and cable installation (due to of fines identified between KP 5 and 1
	The supporting processes on which qualifying natural habitats and the	Increased SSC	Distribution of the feature, including associated transitional habitats, within the site	Maintain the range of the habitat and natural transitions within saltmarsh types and to	It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours foll



not considered to lead to adverse effects on the natural level of turbidity is predicted d no effecs in inorganic nitrogen levels are

ised effects predicted as a result of the lack of sensitivity to the effect, and the fact sult in in combination effects are likely to be tude, it is considered that there will be no in combination increases in SSC.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result ed Development alone.

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

iment disposal activities to outwith WFD ts of sediment plume dispersion modelling distance, there will be no connectivity between

on of dredged material, the worst-case SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

to 200 mgl-1 may be observed locally (i.e. DD pit) and these concentrations could following completion of construction activities.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	habitats of qualifying species rely The populations of			other habitats seaward and landward.	Sediment plumes are also likely to be or pit at which point concentrations of to return to background levels within a activities.
	each of the qualifying species	Increased SSC	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na
	qualifying species within the site	Increased SSC	Future extent of habitat within the site and ability to respond to seasonal changes	Maintain the ability for colonisation each year of the annual species that comprise the habitat.	Natural Variation ranges from approximannual averages of between 5 – 15 m The mouth of Langstone harbour (the approximately 1 km from the proposed location). SSC variability within the har frequent exposure to storm induced flu 2017). Suspended sediments within La 200 mgl-1, while measured SSC in ne mgl-1 (Portsmouth) (Humby and Dunn 2017). Areas of estuarine habitat that could s from the closest marine activity (excavitor be affected by high levels of SSC w background levels. Saltmarsh plants are tolerant of a degriturbidity. It is recognised that turbidity however salt marsh vegetation is immable to photosynthesize. Therefore, sliftrom the Proposed Development are of distribution of Salicornia and other and sediment composition are predicted, a ability to transition are predicted. There adverse effects on site integrity from in Considering the very small and localis Proposed Development, the general la that all other activities which may result.
		Increased SSC	Structure and function (including its typical species): key structural, influential and distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature: Aster tripolium, Puccinellia maritima, Salicornia species, Sueada maritima and Atriplex portulacoides. SM27 also includes Sagina	
		Increased SSC	Structure and function: sediment size and availability	Maintain the availability and size range of those sediments typical of the feature at the site.	
		Increased SSC	Supporting Processes: functional connectivity with wider coastal sedimentary system	Maintain adequate inputs of sediment in the water column from the sediment sources (offshore / eroding cliffs, etc).	



e transported up to 5 km away from the trench of 5 to 10 mgl-1 are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl-1) natural variation.

ximately <5 to 75 mgl-1 in coastal areas, with mgl-1 observed within surface waters.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible arbour is high, owing to its tidal nature and fluctuations (New Forest District Council, Langstone harbour have been measured at hearby harbours have been recorded up to 100 nn, 1975 – cited in New Forest District Council,

support this feature are located over 2 km avation of HDD pits), and as such are unlikely with received levels likely within normal

gree of increased SSC, and the resulting ty reduces the light attenuation through water, mersed for the majority of the tidal cycle and slight increases in SSC as predicted to arise considered unlikely to affect the growth or nnuals colonising mud and sand within the normal sediment and water movement, or and no effects on habitat connectivity or their erefore, it is considered that there will be no increased SSC on this feature.

ised effects predicted as a result of the lack of sensitivity to the impact, and the fact sult in in combination effects are likely to be

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
					similar or lesser in extent and magnitude adverse effects on site integrity from in
		Deposition of sediment	Supporting Processes: sedimentary Processes	Maintain the sedimentary processes (suspended sediment, sediment transfer, etc) that sustain the elevation and topography of the marsh surface.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis sediment deposition with the SAC. Deposition from other cable installation is not predicted to be significant with a rapidly (i.e. within several hundred me
		Deposition of sediment	Supporting Processes: tidal Processes	Maintain the degree of tidal immersion and emersion and tidal flows that supports the function of the habitat	be dispersed across a greater spatial e tidal cycle. However, due to the volume water column and significant dispersio deposition will be negligible with sedim under the forcing of tidal flows.
		Deposition of Sediment (Smothering)	Distribution of the feature, including associated transitional habitats, within the site	type. Maintain the range of the habitat and natural transitions within saltmarsh types and to other habitats seaward and landward.	The mouth of Langstone harbour (the approximately 1 km from the proposed location), and the closest area of estua over 2 km from the HDD pits. Therefore area where the majority of sediment is Therefore, any deposition of sediment is pioneer species, are adapted to accreatificated by smothering events for up to due to the negligible levels of sediment any material is likely to be redistributed considered that sediment deposition and the sediment d
		Deposition of Sediment (Smothering)	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	
		Deposition of Sediment (Smothering)	Future extent of habitat within the site and ability to respond to seasonal changes	Maintain the ability for colonisation each year of the annual species that comprise the habitat.	
		Deposition of Sediment (Smothering)	Structure and function (including its typical species): key structural, influential and distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat	Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sin considered that there will be no adverse combination effects of deposition of se



tude, it is considered that there will be no in combination increases in SSC.

iment disposal activities to outwith WFD is of sediment plume dispersion modelling listance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited hetres of the cable trench). Finer sediment will I extent, transiently depositing throughout the mes of sediment likely to be liberated into the ion of fine sediment, it is considered that iments quickly resuspended and redistributed

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible tuarine habitat that could support this feature is ore, it is considered that it will be outwith the is deposited.

nt will be light, and likely within the natural sent in the area. Saltmarsh plants, particularly reting environments and may not be adversely to a month (Tyler-Walters, 2001). Therefore, ent predicted to be deposited, and the fact that and through normal tidal conditions, it is as a result of the Proposed Development will be feature.

ised effects predicted as a result of the t that all other activities which may result in in imilar or lesser in extent and magnitude, it is erse effects on site integrity from in sediment (smothering).

	Conservation Objective	Effect	Attribute	Target	Assessment
				feature: Aster tripolium, Puccinellia maritima, Salicornia species, Sueada maritima and Atriplex portulacoides. SM27 also includes Sagina	
		Deposition of Sediment (Smothering)	Structure and function: sediment size and availability	Maintain the availability and size range of those sediments typical of the feature at the site.	
		Deposition of Sediment (Smothering)	Supporting Processes: functional connectivity with wider coastal sedimentary system	Maintain adequate inputs of sediment in the water column from the sediment sources (offshore / eroding cliffs, etc).	
		Pollution	Supporting Processes: water quality	Where the feature is dependent on estuarine water, ensure water quality and quantity is restored to a standard that provides the	Unplanned oil or chemical spillages f development phases. However, routi practice in terms of waste manageme 10.2.5) and strict navigational protoci occurring highly unlikely and therefor integrity as a result of the Proposed I
				necessary conditions to support the feature.	Given the scale and nature of other p requirement to adhere to similar best in combination effects, it is predicted integrity from in combination effects



es from vessels may occur during all outine mitigation measures of standard best ement, pollution prevention measures (Section ocols will make the likelihood of these events fore will not result in adverse effects on Site ed Development alone.

r potential plans and projects and the est practice measures which could contribute to ed that there will be no adverse effect on site s with other plans and projects.

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
Spartina swards (Spartinion maritimae)	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species The structure and function (including	Invasive Species	Structure and function: vegetation - undesirable species	The frequency / cover of the following undesirable species are maintained at acceptable levels and are not encouraged by changes in surface condition, soils, nutrient levels or changes to hydrology: Spartina anglica.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for adver- of invasive species. Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adver- result of invasive species.
	function (including typical species) of qualifying natural habitats The structure and function of the habitats of the qualifying species	Increased SSC	Supporting Processes: water quality	Where the feature is dependent on estuarine water, ensure water quality and quantity is restored to a standard that provides the necessary conditions to support the feature.	Mitigation is proposed to restrict sedir waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis increased SSC /sediment plumes with For activities other than the deposition activities which will lead to increased HDD pits, and cable installation (due to of fines identified between KP 5 and 1
	The supporting processes on which qualifying natural habitats and the	Increased SSC	Distribution of the feature, including associated transitional habitats, within the site	Restore the range of the habitat including natural transitions with other saltmarsh types.	It is predicted that peak SSCs of up to within 2 km of the cable trench or HDI potentially persist for several hours for Sediment plumes are also likely to be
	habitats of qualifying species rely	Increased SSC	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	or pit at which point concentrations of to return to background levels within a activities.
	The populations of each of the qualifying species The distribution of	Increased SSC	Future extent of habitat within the site and ability to respond to seasonal changes	Maintain the ability to achieve seasonal fluctuations in the extent of habitat and the suitability of surrounding areas for colonisation.	The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na Natural Variation ranges from approxi- annual averages of between 5 – 15 m



d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

iment disposal activities to outwith WFD is of sediment plume dispersion modelling listance, there will be no connectivity for thin the SAC.

on of dredged material, the worst-case SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

to 200 mgl-1 may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. transported up to 5 km away from the trench of 5 to 10 mgl-1 are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl-1) natural variation.

ximately <5 to 75 mgl-1 in coastal areas, with mgl-1 observed within surface waters.

WSP/Natural Power

	Objective				
qualifying species within the site	qualifying species within the site	Increased SSC	Structure and function (including its typical species): key structural, influential and distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature: Spartina maritima, S. alterniflora, S. townsendii, Arthrocnemum perenne, Puccinellia maritima, Salicornia species, Sueada maritima	The mouth of Langstone harbour (the approximately 1 km from the proposed location). SSC variability within the har frequent exposure to storm induced flu 2017). Suspended sediments within La 200 mgl-1, while measured SSC in near mgl-1 (Portsmouth) (Humby and Dunn 2017). Areas of estuarine habitat that could sa from the closest marine activity (excave to be affected by high levels of SSC with background levels.
		Increased SSC	Structure and function: sediment size and availability	Maintain the availability and size range of those sediments typical of the feature at the site.	Saltmarsh plants are tolerant of a degr turbidity. It is recognised that turbidity however salt marsh vegetation is imme able to photosynthesize. Therefore, sli from the Proposed Development are c distribution of Spartina swards within the natural levels of turbidity are predicted effects on water quality or availability, feature to transition or fluctuate in exter that there will be no effects on site inter Considering the very small and localise Proposed Development, the general la that all other activities which may result
				similar or lesser in extent and magnitud adverse effects on site integrity from in	
	Deposition of sediment	Supporting Processes: sedimentary Processes	Maintain the sedimentary processes (suspended sediment, sediment transfer, etc) that sustain the elevation	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis sediment deposition with the SAC.	
				and topography of the marsh surface.	Deposition from other cable installation is not predicted to be significant with a



e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible arbour is high, owing to its tidal nature and fluctuations (New Forest District Council, Langstone harbour have been measured at hearby harbours have been recorded up to 100 nn, 1975 – cited in New Forest District Council,

support this feature are located over 2 km avation of HDD pits), and as such are unlikely with received levels likely within normal

gree of increased SSC, and the resulting ty reduces the light attenuation through water, mersed for the majority of the tidal cycle and slight increases in SSC as predicted to arise considered unlikely to affect the growth or the Solent Maritime SAC. No effect on the ed following cessation of the activity, and no v, sediment composition, or the ability of this tent are predicted. Therefore, it is considered tegrity from increased SSC on this feature.

ised effects predicted as a result of the lack of sensitivity to the impact, and the fact sult in in combination effects are likely to be tude, it is considered that there will be no in combination increases in SSC.

iment disposal activities to outwith WFD is of sediment plume dispersion modelling listance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of sediment	Supporting Processes: tidal Processes	Maintain the degree of tidal immersion and emersion that supports the function of the habitat type.	rapidly (i.e. within several hundred met be dispersed across a greater spatial e tidal cycle. However, due to the volume water column and significant dispersion deposition will be negligible with sedim
		Deposition of Sediment (Smothering)	Distribution of the feature, including associated transitional habitats, within the site	Restore the range of the habitat including natural transitions with other saltmarsh types.	under the forcing of tidal flows. The mouth of Langstone harbour (the orapproximately 1 km from the proposed location), and the closest area of estual swards is over 2 km from the HDD pits
		Deposition of Sediment (Smothering)	Structure and function: sediment size and availability	Maintain the availability and size range of those sediments typical of the feature at the site.	Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sim
		Deposition of Sediment (Smothering)	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	considered that there will be no advers combination deposition of sediment (sr and water movement, or sediment com
		Deposition of Sediment (Smothering)	Future extent of habitat within the site and ability to respond to seasonal changes	Maintain the ability to achieve seasonal fluctuations in the extent of habitat and the suitability of surrounding areas for colonisation.	habitat connectivity, emersion regim Therefore, any deposition of sedime variation of the sediment regime pre to accreting environments and will n for up to a month (Tyler-Walters, 200
		Deposition of Sediment (Smothering)	Structure and function (including its typical species): key structural, influential and distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature: Spartina maritima, S. alterniflora, S. townsendii, Arthrocnemum perenne, Puccinellia maritima, Salicornia species, Sueada maritima	



etres of the cable trench). Finer sediment will I extent, transiently depositing throughout the nes of sediment likely to be liberated into the ion of fine sediment, it is considered that ments quickly resuspended and redistributed

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible uarine habitat that could support Spartina ts. Therefore, it is considered that it will be f sediment is deposited.

sed effects predicted as a result of the that all other activities which may result in in milar or lesser in extent and magnitude, it is rse effects on site integrity from in smothering). No effects on normal sediment imposition are predicted, and no effects on es, or their ability to transition are predicted.

at will be light, and likely within the natural sent in the area. Saltmarsh plants are adapted at be adversely affected by smothering events 1).

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Pollution	Supporting Processes: water quality	Where the feature is dependent on estuarine water, ensure water quality and quantity is restored to a standard that provides the necessary conditions to support the feature.	Unplanned oil or chemical spillages from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity. Given the scale and nature of other por requirement to adhere to similar best point in combination effects, it is predicted the integrity in combination with other plan
Subtidal course sediment	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any o considered that no in combination adve result of invasive species.
	The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of the qualifying species The supporting processes on which qualifying natural habitats and the	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the sub- feature.	Unplanned oil or chemical spillages from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity. Given the scale and nature of other po
		Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	requirement to adhere to similar best p in combination effects, it is predicted th integrity in combination with other plan



from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on Site

botential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

from vessels may occur during all ne mitigation measures of standard best ent, pollution prevention measures (Section ols will make the likelihood of these events re will not result in adverse effects on Site

cotential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	<ul><li>habitats of qualifying species rely</li><li>The populations of each of the qualifying species</li><li>The distribution of qualifying species within the site</li></ul>	Deposition of sediment	Supporting Processes: sediment movement and hydrodynamic regime	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at the sediment deposition with the SAC.
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	volumes of sediment likely to be liberate dispersion of fine sediment, it is conside sediments quickly resuspended and re Therefore, any deposition of sediment not adversely affect the integrity of the environment with a relatively high nature sensitive to effects at the predicted leve and water movement, or sediment com Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sim considered that there will be no advers in combination deposition of sediment
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\ge$ 5.7 mg L-1 (at 35 salinity) for 95 % of year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis increased SSC with the SAC. For activities other than the deposition activities which will lead to increased S HDD pits, and cable installation (due to of fines identified between KP 5 and 15



ment disposal activities to outwith WFD s of sediment plume dispersion modelling this distance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited etres of the cable trench and within liment will be dispersed across a greater throughout the tidal cycle. However, due to the rated into the water column and significant sidered that deposition will be negligible with redistributed under the forcing of tidal flows.

nt will be 'light', temporary in nature and will be feature which, being a high energy tural level of sediment movement, is not evel. No signficant effects on normal sediment omposition are predicted.

sed effects predicted as a result of the that all other activities which may result in in imilar or lesser in extent and magnitude, it is erse effects on site integrity from effects from ht (smothering).

ment disposal activities to outwith WFD s of sediment plume dispersion modelling listance, there will be no connectivity from

on of dredged material, the worst-case SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	It is predicted that peak SSCs of up to within 2 km of the cable trench or HDI potentially persist for several hours for Sediment plumes are also likely to be or pit at which point concentrations of to return to background levels within a activities. The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Natural Variation ranges from appro annual averages of between 5 – 15 Coarse sediment habitats have a low present are naturally found within his mobility is common (McQuillan and
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	composition or distribution are predict on Operations package lists this sub-fi- stage of construction, operation or dec to be outwith normal levels and any ef short term, returning to background or
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	<ul> <li>inorganic nitrogen levels are predicted predicted which will be similar to nature considered that there will be no effects sub feature.</li> <li>Considering the very small and localis Proposed Development, the lack of set other activities which may result in in considering the term and magnitude, it is considered to the set on site integrity from in combining the set of the</li></ul>
Subtidal mixed sediments	Maintaining or restoring: The extent and distribution of	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species.



to 200 mgl<sup>-1</sup> may be observed locally (i.e. DD pit) and these concentrations could following completion of construction activities. e transported up to 5 km away from the trench of 5 to 10 mgl<sup>-1</sup> are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl-1) natural variation.

ximately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

y sensitivity to increases in SSC as the species gh energy envrionments were sediment Fillin, 2006), as such no effects on species cted. Furthermore, the Natural England Advice feature as not sensitive to nutrients at any ecommissionin. Changes DO are not expected effects to this attribute would be temporary and on cessation of the activity. No effects on ed. Therefore, considering the discreet events ural variation already experienced, it is cts on site integrity from increased SSC on this

ised effects predicted as a result of the sensitivity to the impact, and the fact that all combination effects are likely to be similar or considered that there will be no adverse ination increases in SSC.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	qualifying natural habitats and habitats of the qualifying species				Due to the lack of predicted effects, all practice measures employed for any c considered that no in combination adv result of invasive species.
	The structure and function (including typical species) of qualifying natural habitats	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the habitat.	Unplanned oil or chemical spillages from development phases. However, routing practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity.
	<ul> <li>The structure and function of the habitats of the qualifying species</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>The populations of each of the qualifying species</li> <li>The distribution of qualifying species within the site</li> </ul>	Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	Given the scale and nature of other por requirement to adhere to similar best p in combination effects, it is predicted the integrity in combination with other plan
		Deposition of Sediment (Smothering)	Supporting Processes: sediment movement and hydrodynamic regime	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at the sediment deposition with the SAC. Deposition from other cable installation is not predicted to be significant with a rapidly (i.e. within several hundred me comparable habitat types). Finer sedim spatial extent, transiently depositing the volumes of sediment likely to be liberated dispersion of fine sediment, it is considered
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Therefore, any deposition of sediment not adversely affect the integrity of the environment with a relatively high natu



along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

from vessels may occur during all ne mitigation measures of standard best ent, pollution prevention measures (Section ols will make the likelihood of these events re will not result in adverse effects on Site

ootential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD is of sediment plume dispersion modelling t this distance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited hetres of the cable trench and within liment will be dispersed across a greater throughout the tidal cycle. However, due to the rated into the water column and significant sidered that deposition will be negligible with redistributed under the forcing of tidal flows.

nt will be 'light', temporary in nature and will ne feature which, being a high energy tural level of sediment movement, is not

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	sensitive to effects at the predicted lev movement, or sediment composition a Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sin
	Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	considered that there will be no advers combination effects of deposition of se	
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis increased SSC with the SAC. For activities other than the deposition activities which will lead to increased S HDD pits, and cable installation (due to of fines identified between KP 5 and 1
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours foll Sediment plumes are also likely to be or pit at which point concentrations of a to return to background levels within a activities. The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na Natural Variation ranges from approxim
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	annual averages of between 5 – 15 m Mixed sediment habitats have a low se present are naturally found within high



evel. No effects on normal sediment and water are predicted.

ised effects predicted as a result of the t that all other activities which may result in in imilar or lesser in extent and magnitude, it is erse effects on site integrity from in sediment (smothering).

iment disposal activities to outwith WFD is of sediment plume dispersion modelling listance, there will be no connectivity from

on of dredged material, the worst-case SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

to 200 mgl<sup>-1</sup> may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. e transported up to 5 km away from the trench of 5 to 10 mgl<sup>-1</sup> are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl-1) natural variation.

ximately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

sensitivity to increases in SSC as the species the energy envrionments were sediment

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	mobility is common (Readman, 2016), or distribution are predicted. Furthermore, the Natural England Adv feature as not sensitive to nutrients at
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	decommissionin. Changes DO are not any effects to this attribute would be te background on cessation of the activity predicted. Therefore, considering the o similar to natural variation already expen- no effects on site integrity from increas Considering the very small and localise Proposed Development, the lack of se other activities which may result in in o lesser in extent and magnitude, it is co effects on site integrity from in combina
Subtidal sand	andMaintaining or restoring:andMaintaining or restoring:The extent and distribution of qualifying natural habitats and habitats of the qualifying speciesThe structure and function (including typical species) of qualifying natural habitatsThe structure and function (including typical species) of qualifying natural habitatsThe structure and function of the habitats of the qualifying species	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adverses.
		Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the sub- feature.	Unplanned oil or chemical spillages from development phases. However, routing practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity. Given the scale and nature of other po
		Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to	requirement to adhere to similar best p in combination effects, it is predicted th integrity in combination with other plan



s), as such no effects on species composition

dvice on Operations package lists this subat any stage of construction, operation or ot expected to be outwith normal levels and temporary and short term, returning to rity. No effects on inorganic nitrogen levels are e discreet events predicted which will be sperienced, it is considered that there will be ased SSC on this sub feature.

ised effects predicted as a result of the sensitivity to the impact, and the fact that all combination effects are likely to be similar or considered that there will be no adverse ination effects from increases in SSC.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on Site

botential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	The supporting processes on which qualifying natural habitats and the			Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
	<ul><li>habitats of qualifying species rely</li><li>The populations of each of the qualifying species</li><li>The distribution of qualifying species within the site</li></ul>	Deposition of sediment	Supporting Processes: sediment movement and hydrodynamic regime	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at t sediment deposition with the SAC. Deposition from other cable installation is not predicted to be significant with a rapidly (i.e. within several hundred me comparable habitat types). Finer sedim spatial extent, transiently depositing th volumes of sediment likely to be liberal dispersion of fine sediment, it is consid
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	sediments quickly resuspended and re Therefore, any deposition of sediment not adversely affect the integrity of the environment with a relatively high natu sensitive to effects at the predicted lev movement, or sediment composition a Considering the very small and localis Proposed Development, and the fact the combination effects are likely to be sin considered that there will be no adver- combination effects of deposition of se
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\ge$ 5.7 mg per litre (at 35 salinity) for 95	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis increased SSC with the SAC.



iment disposal activities to outwith WFD ts of sediment plume dispersion modelling t this distance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited hetres of the cable trench and within diment will be dispersed across a greater throughout the tidal cycle. However, due to the rated into the water column and significant sidered that deposition will be negligible with redistributed under the forcing of tidal flows.

nt will be 'light', temporary in nature and will ne feature which, being a high energy itural level of sediment movement, is not evel. No effects on normal sediment and water are predicted.

ised effects predicted as a result of the t that all other activities which may result in in imilar or lesser in extent and magnitude, it is erse effects on site integrity from in sediment (smothering).

iment disposal activities to outwith WFD ts of sediment plume dispersion modelling distance, there will be no connectivity from

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	Conservation Objective	Effect	Attribute	Target	Assessment
				% of the year), avoiding deterioration from existing levels.	For activities other than the deposition activities which will lead to increased S HDD pits, and cable installation (due to of fines identified between KP 5 and 1
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	It is predicted that peak SSCs of up to within 2 km of the cable trench or HDE potentially persist for several hours fol Sediment plumes are also likely to be or pit at which point concentrations of to return to background levels within a activities. The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na Natural Variation ranges from approxim
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	annual averages of between 5 - 15 m
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	background on cessation of the activity predicted. Therefore, considering the of similar to natural variation already exp no adverse effects on site integrity from Considering the very small and localise Proposed Development, the lack of se other activities which may result in in of lesser in extent and magnitude, it is con- effects on site integrity from in combina



on of dredged material, the worst-case SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

to 200 mgl<sup>-1</sup> may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. te transported up to 5 km away from the trench of 5 to 10 mgl<sup>-1</sup> are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl-1) natural variation.

ximately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

ensitivity to increases in SSC as the species of energy envrionments were sediment such no effects on species composition or

dvice on Operations package lists this subat any stage of construction, operation or ot expected to be outwith normal levels and temporary and short term, returning to rity. No effects on inorganic nitrogen levels are e discreet events predicted which will be operienced, it is considered that there will be om increased SSC on this sub feature.

ised effects predicted as a result of the sensitivity to the impact, and the fact that all combination effects are likely to be similar or considered that there will be no adverse ination increases in SSC.

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
Subtidal seagrass beds	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adversed result of invasive species.
	<ul> <li>The structure and function (including typical species) of qualifying natural habitats</li> <li>The structure and function of the habitats of the qualifying species</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>The populations of each of the qualifying species</li> <li>The distribution of qualifying species within the site</li> </ul>	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the sub- feature.	Unplanned oil or chemical spillages from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocol occurring highly unlikely and therefore integrity.
		Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status (according to Annex VIII and X of the WFD), avoiding deterioration from existing levels.	Given the scale and nature of other por requirement to adhere to similar best p in combination effects, it is predicted th integrity in combination with other plan
		Deposition of sediment	Supporting Processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km); which e
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Marine Cable Corridor. Results of sedi 6.2 of ES) indicate that, at this distance the SAC resulting from dredge disposa Deposition from other cable installation between KP1 and KP1.6) is not predic material mobilised deposited rapidly (i. cable trench). Finer sediment will be di- transiently depositing throughout the ti
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	



d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

from vessels may occur during all ne mitigation measures of standard best ent, pollution prevention measures (Section ols will make the likelihood of these events re will not result in adverse effects on Site

botential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix nce, there will be no sediment deposition with sal activities.

on activities (including excavation of HDD pits licted to be significant, with any coarse (i.e. within several hundred metres of the dispersed across a greater spatial extent, tidal cycle. However, due to the low volumes

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of Sediment (Smothering)	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	of sediment likely to be liberated into the fine sediment, it is considered that dep quickly resuspended and redistributed. The mouth of Langstone harbour (the of containing this sub-feature) is approxim- entry/exit pits (at their closest possible it will be outwith the area where the mat Therefore, any deposition of sediment not adversely affect the integrity of the within an area of natural sediment accu- deposition predicted. No significant effer movement, or sediment composition a Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sim- considered that there will be no adverse combination effects of deposition of se
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at the between increased SSC / sediment plue disposal of dredge material. For activities other than the deposition activities which will lead to increased S HDD pit(s) (between KP1 and KP1.6), for the liberation and dispersal of fines
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms)	other isolated locations). It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours folk Sediment plumes are also likely to be to or pit at which point concentrations of 5 to return to background levels within a activities.



the water column and significant dispersion of position will be negligible with sediments d under the forcing of tidal flows.

closest Estuary feature within the SAC imately 1 km from the proposed HDD e location), and therefore it is considered that najority of sediment is deposited.

It will be 'light', temporary in nature and will e sub-feature, which due to its presence cretion will be tolerant of the very low levels of ffects on normal sediment and water are predicted.

sed effects predicted to result from the that all other activities which may result in in milar or lesser in extent and magnitude, it is rse effects on site integrity from in ediment (smothering).

ment disposal activities to outwith WFD s of sediment plume dispersion modelling this distance, there will be no connectivity lumes and the SAC resulting from the

n of dredged material, the worst-case SSC are considered to be excavation at the , and cable installation (due to the potential s identified between KP 5 and 15, and in

200 mgl<sup>-1</sup> may be observed locally (i.e.
D pit) and these concentrations could
Illowing completion of construction activities.
transported up to 5 km away from the trench
5 to 10 mgl<sup>-1</sup> are predicted. SSC is expected
a few days following completion of these

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				do not affect the integrity of the site and features.	The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above na Natural Variation ranges from approxim
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	annual averages of between 5 – 15 mg The mouth of Langstone harbour (the which this sub-feature is present) is ap entry/exit pits (at their closest possible is high, owing to its tidal nature and fre
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	fluctuations (New Forest District Counc Langstone harbour have been measur nearby harbours have been recorded Dunn, 1975 – cited in New Forest Dist
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	Seagrass beds, although not tolerant to (due to a reduction in photosynthesis a to potentially be tolerant to such short experienced as a result of the Propose Seagrass beds are also located over a and as such are unlikely to be affected levels likely well within normal backgro experienced in this environment. Littor during periods of exposure. No change distribution are therefore considered lik Development. In addition, according to this sub feature is not considered senses natural level of turbidity is predicted for effecs in inorganic nitrogen levels are p increased SSC, which will only persist normal levels are not considered to lease Proposed Development, the general last that all other activities which may result similar or lesser in extent and magnitud adverse effects on site integrity from in



be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl<sup>-1</sup>) natural variation.

kimately <5 to 75 mgl<sup>-1</sup> in coastal areas, with mgl<sup>-1</sup> observed within surface waters.

e closest Estuary feature within the SAC within approximately 1 km from the proposed HDD de location). SSC variability within the harbour requent exposure to storm induced ancil, 2017). Suspended sediments within ured at 200 mgl<sup>-1</sup>, while measured SSC in d up to 100 mgl<sup>-1</sup> (Portsmouth) (Humby and strict Council, 2017).

to very high or long term increases in SSC and reduced oxygen levels), are considered t term isolated events as would be sed Development (D'Avack, et al., 2019). a kilometre from the mouth of the harbour ed by very high levels of SSC with received round levels, and lower than peak levels oral beds are also able to photosynthesise ges to littoral seagrass bed function or likely to arise as a result of the Proposed to in the Advice on Operations for this SAC, nsitive to deoxygenation. No effect on the ollowing cessation of the activity, and no predicted. Therefore, the predicted levels of st for a short duration before returning to ead to adverse effects on site integrity.

ised effects predicted as a result of the lack of sensitivity to the impact, and the fact sult in in combination effects are likely to be tude, it is considered that there will be no in combination effects of increases in SSC.

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
Mudflats and sandflats not submerged at low tide	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and p followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adver- result of invasive species.
	<ul> <li>The structure and function (including typical species) of qualifying natural habitats</li> <li>The structure and function of the habitats of the qualifying species</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>The populations of each of the qualifying species</li> <li>the distribution of qualifying species within the site</li> </ul>	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL) threshold. For example, mean cadmium levels should be maintained below the ERL of 1.2 mg per kg.	Unplanned oil or chemical spillages fro development phases. However, routine practice in terms of waste managemen 10.2.5) and strict navigational protocols occurring highly unlikely and therefore integrity. Given the scale and nature of other por requirement to adhere to similar best p in combination effects, it is predicted the integrity in combination with other plane
		Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
		Deposition of sediment	Supporting Processes: sediment movement and hydrodynamic regime	Maintain sediment transport pathways to and from the feature to ensure replenishment of the feature, and / or replenishment of	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at th sediment deposition with the SAC.



d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will make the likelihood of these events re will not result in adverse effects on Site

cotential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site ans and projects.

iment disposal activities to outwith WFD ts of sediment plume dispersion modelling t this distance, there will be no connectivity for

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				habitats that rely on the sediment supply from the feature.	Deposition from other cable installation is not predicted to be significant with a rapidly (i.e. within several hundred me comparable habitat types). Finer sedin spatial extent, transiently depositing th volumes of sediment likely to be libera dispersion of fine sediment, it is consid sediments quickly resuspended and re
					Therefore, any deposition of sediment not adversely affect the integrity of the this level. No significant effects on nor sediment composition are predicted.
					Considering the very small and localise Proposed Development, and the fact the combination effects are likely to be sime considered that there will be no adverse combination effects of deposition of se
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of mudflat and sandflat communities according to the map.	For activities other than the deposition activities which will lead to increased S HDD pits, and cable installation (due to of fines identified between KP 5 and 1 It is predicted that peak SSCs of up to
		Increased SSC	Structure: species composition of component communities	Restore the faunal quality of this feature to Good Status (a minimum mean Infaunal Quality Index ('IQI') score of $\geq$ 0.64), with no sustained deterioration within the status.	within 2 km of the cable trench or HDD potentially persist for several hours foll Sediment plumes are also likely to be or pit at which point concentrations of a to return to background levels within a activities. The finest sediments will potentially be area, however it is highly likely that SS
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels	and therefore not discernible above na



on activities (including excavation of HDD pits) any coarse material mobilised deposited netres of the cable trench and within liment will be dispersed across a greater throughout the tidal cycle. However, due to the rated into the water column and significant sidered that deposition will be negligible with redistributed under the forcing of tidal flows.

nt will be 'light', temporary in nature and will ne feature which is not sensitive to effects at prmal sediment and water movement, or

ised effects predicted as a result of the t that all other activities which may result in in imilar or lesser in extent and magnitude, it is erse effects on site integrity fromany in sediment (smothering).

on of dredged material, the worst-case SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

to 200 mgl-1 may be observed locally (i.e. DD pit) and these concentrations could ollowing completion of construction activities. te transported up to 5 km away from the trench of 5 to 10 mgl-1 are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore SSCs at these distances will be low (< 5 mgl-1) natural variation.

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	Natural Variation ranges from approxi annual averages of between 5 – 15 m Mudflat and sandflat habitats are not in SSC. Therefore, considering the dis to natural variation already experience effects on site integrity from increased no adverse effects on faunal commun
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\geq$ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	natural level of turbidity or DO is predi no effects on inorganic nitrogen levels Considering the very small and localis Proposed Development, the lack of se other activities which may result in in lesser in extent and magnitude, it is co effects on site integrity from in combin
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	
Sandbanks slightly covered by seawater all the time	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species	Invasive species	Structure: non-native species and pathogens	Reduce the introduction and spread of non-native species and pathogens, and their impacts.	Application of best practice plans and followed by all contractors and vessels introduction of INIS introduction as far that there are is no potential for advers of invasive species. Due to the lack of predicted effects, all practice measures employed for any of considered that no in combination adversed result of invasive species.



ximately <5 to 75 mgl-1 in coastal areas, with mgl-1 observed within surface waters.

t sensitive or have low sensitivity to increases discreet events predicted which will be similar ced, it is considered that there will be no ed SSC on mudflat and sandflat features and inity structure or distribution. No effect on the dicted following cessation of the activity, and ls are predicted.

ised effects predicted as a result of the sensitivity to the impact, and the fact that all n combination effects are likely to be similar or considered that there will be no adverse ination increases in SSC.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure erse effects on integrity on the site as a result

along with the application of any similar best other plan and project identified, it is dverse effects will arise on this feature as a

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	The structure and function (including typical species) of qualifying natural habitats The structure and	Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the feature (and each of its sub- features).	Unplanned oil or chemical spillages fro development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocols occurring highly unlikely and therefore integrity. Given the scale and nature of other por requirement to adhere to similar best p
	function of the habitats of the qualifying species The supporting processes on which qualifying natural habitats and the	Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	in combination effects, it is predicted th integrity in combination with other plans
habitats of qualifying species rely The populations of each of the qualifyin species The distribution of qualifying species within the site	<ul> <li>species rely</li> <li>The populations of each of the qualifying species</li> <li>The distribution of qualifying species</li> </ul>	Deposition of sediment	Supporting Processes: sediment movement and hydrodynamic regime	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at the sediment deposition with the SAC. Deposition from other cable installation is not predicted to be significant with an rapidly (i.e. within several hundred met comparable habitat types). Finer sedim spatial extent, transiently depositing the volumes of sediment likely to be liberate dispersion of fine sediment, it is conside
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of subtidal sandbank communities according to the map.	sediments quickly resuspended and re Therefore, any deposition of sediment not adversely affect the integrity of the this level. No significant effects on norr sediment composition are predicted.
		Deposition of Sediment (Smothering)	Structure: species composition of	Restore the Species composition of	Considering the very small and localise Proposed Development, and the fact the



rom vessels may occur during all ne mitigation measures of standard best ent, pollution prevention measures (Section ols will make the likelihood of these events e will not result in adverse effects on Site

ootential plans and projects and the practice measures which could contribute to that there will be no adverse effect on site ns and projects.

ment disposal activities to outwith WFD s of sediment plume dispersion modelling this distance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited etres of the cable trench and within iment will be dispersed across a greater hroughout the tidal cycle. However, due to the ated into the water column and significant idered that deposition will be negligible with redistributed under the forcing of tidal flows.

It will be 'light', temporary in nature and will e feature which is not sensitive to effects at rmal sediment and water movement, or

sed effects predicted as a result of the that all other activities which may result in in

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
			component communities	component communities.	combination effects are likely to be sim considered that there will be no advers combination effects of deposition of se
		Deposition of Sediment (Smothering)	Structure: sediment composition and distribution	Maintain the distribution of sediment composition types across the feature (and each of its sub- features) (presence / absence of areas mapped in GIS), compared to an established baseline, to ensure continued structural habitat integrity and connectivity.	
	Increased SSC	Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically $\geq$ 5.7 mg per litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dis increased SSC with the SAC. For activities other than the deposition activities which will lead to increased S HDD pits, and cable installation (due to of fines identified between KP 5 and 18
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features.	It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD potentially persist for several hours foll Sediment plumes are also likely to be or pit at which point concentrations of s to return to background levels within a activities.



similar or lesser in extent and magnitude, it is erse effects on site integrity from in sediment (smothering).

iment disposal activities to outwith WFD ts of sediment plume dispersion modelling distance, there will be no connectivity from

on of dredged material, the worst-case I SSC are considered to be excavation at the to the potential for the liberation and dispersal 15, and in other isolated locations).

to 200 mgl-1 may be observed locally (i.e. DD pit) and these concentrations could following completion of construction activities. the transported up to 5 km away from the trench of 5 to 10 mgl-1 are predicted. SSC is expected a few days following completion of these

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of subtidal sandbank communities according to the map.	The finest sediments will potentially be area, however it is highly likely that SS and therefore not discernible above nat Natural Variation ranges from approxim
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	annual averages of between 5 – 15 mg Mudflat and sandflat habitats are not se in SSC. Therefore, considering the disc to natural variation already experienced
		Increased SSC	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	distribution are predicted. Furthermore, package lists this sub-feature as not se construction, operation or decommission outwith normal levels and any effects to term, returning to background on cessa nitrogen levels are predicted. It is there on site integrity from increased SSC on the time.
					Considering the very small and localise Proposed Development, the lack of set other activities which may result in in co lesser in extent and magnitude, it is con effects on site integrity from in combina

Conclusion: No significant adverse effect on site integrity can be concluded for the Solent Maritime SAC, arising from either the Proposed Development alone, or in combination with other plans or projects.



e transported up to 6-10 km in the nearshore SCs at these distances will be low (< 5 mgl-1) atural variation.

imately <5 to 75 mgl-1 in coastal areas, with ngl-1 observed within surface waters.

sensitive or have low sensitivity to increases screet events predicted which will be similar ed, no effects on species composition or e, the Natural England Advice on Operations sensitive to nutrients at any stage of sionin. Changes DO are not expected to be to this attribute would be temporary and short sation of the activity. No effects on inorganic refore considered that there will be no effects on Sandbanks slightly covered by seawater all

sed effects predicted as a result of the ensitivity to the impact, and the fact that all combination effects are likely to be similar or onsidered that there will be no adverse nation increases in SSC.

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# 10.11. SOUTH WIGHT MARITIME SAC

## 10.11.1. **OVERVIEW**

10.11.1.1. The South Wight Maritime SAC runs the full length of the south coast of the Isle of Wight, from the sea stacks of the Needles in the west to Bembridge Point in the east. The designated features for which LSE could not be ruled out within this SAC were: **Reefs** and **Submerged or partially submerged sea caves.** 

### 10.11.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

- 10.11.2.1. Site-specific SACO is available for the Solent Maritime SAC<sup>43</sup>.
- 10.11.2.2. Table 10-19 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

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https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030061&SiteName=sole nt&SiteNameDisplay=South+Wight+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAAre a=&NumMarineSeasonality=0 Accessed October 2019

Feature/Sub-feature	Effect for which LSE could not be excluded	Equivalent attribute
Reefs Circalittoral rock Infralittoral rock Intertidal rock Subtidal stony reef	Increased SSC Deposition of sediment (smothering)	Supporting processes: sedimentation rate Distribution: presence and spatial distribution of biological communities Structure: species composition of component communities Structure: substrate composition and distribution Supporting processes: water quality – DO Supporting processes: water quality – nutrients Supporting processes: water quality – turbidity
Submerged or partially	Pollution Invasive Species Pollution	<ul> <li>Structure: physical structure of rocky substrate</li> <li>Supporting processes: water quality – contaminants</li> <li>Supporting processes: sediment contaminants</li> <li>Structure: non-native species and pathogens</li> <li>Supporting processes: sediment contaminants</li> </ul>
submerged sea caves	Invasive Species Increased SSC Deposition of sediment (smothering)	<ul> <li>Structure: non-native species and pathogens</li> <li>Supporting processes: sedimentation rate</li> <li>Distribution: presence and spatial distribution of biological communities</li> <li>Structure: species composition of component communities</li> <li>Structure: substrate composition and distribution</li> <li>Supporting processes: water quality – DO</li> <li>Supporting processes: water quality – nutrients</li> <li>Supporting processes: water quality – turbidity</li> </ul>

# Table 10-19 - SACO attributes screened in for assessment



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- 10.11.2.3. All other attribute/receptor combinations present within the Suplementary Advice on Conservation Objectives for this SAC were deemed to not be relevant to the effects screened in to the AA.
- 10.11.2.4. For those designated features where LSE could not be excluded in Section 7, an assessment of potential adverse effects on site integrity is presented in Table 10-20 below.
- 10.11.2.5. It is concluded that there will be no adverse effects on site integrity for the South Wight Maritime SAC, either from the Proposed Development alone, or in combination with other plans or projects, following the application of mitigation.

			0,		
Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
re th di q	maintaining or restoring: the extent and distribution of qualifying natural habitats and habitats	Invasive Species	Structure: non-native species and pathogens	Restrict the introduction and spread of non- native species and pathogens, and their impacts.	Application of best practice plans and procedures (see contractors and vessels. This will reduce the potential f far as is reasonably practicable and will ensure that the on integrity on the site as a result of invasive species. Due to the lack of predicted effects, along with the app measures employed for any other plan and project iden combination adverse effects will arise on this feature as
	of the qualifying species the structure and function (including typical species) of qualifying natural habitats the structure and function of the habitats of the	Deposition of sediment	Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sediment disposal action buffer of 3 km); which equates to disposal seaward of I Results of sediment plume dispersion modelling (Appendistance, there no will be sediment deposition with the
		Deposition of sediment	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	activities. Deposition from other cable installation activities (includ KP1 and KP1.6) is not predicted to be significant, with rapidly (i.e. within several hundred metres of the cable dispersed across a greater spatial extent, transiently de However, due to the volumes of sediment likely to be lis significant dispersion of fine sediment, it is considered
<ul> <li>qualifying species</li> <li>the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely</li> <li>the populations of each of the qualifying species</li> </ul>	the supporting processes on which qualifying natural	Deposition of sediment	Structure: species composition of component communities	Maintain the species composition of component communities.	sediments quickly resuspended and redistributed unde The closest Reef feature within the SAC is approximate entry/exit pits (at their closest possible location), and th outwith the area where the majority of sediment is depo- sediment will be light, temporary in nature and will not a
	Deposition of sediment	Structure: substrate composition and distribution	Maintain the surface and structural complexity, and the stability of the reef structure.	feature which is not sensitive to effects at this level. On deposition will return, and no effects on distribution and availability or structural integrity of features, are predict Considering the very small and localised effects predic Development, and the fact that all other activities which likely to be similar or lesser in extent and magnitude, it for adverse effects on site integrity from in combination	

Table 10-20 - Assessment of potential adverse effects on site integrity for the South Wight Maritime SAC across all phases of the Proposed Development



e section 10.2.5) will be followed by all for introduction of INIS introduction as here are is no potential for adverse effects

plication of any similar best practice entified, it is considered that no in as a result of invasive species.

tivities to outwith WFD waters (plus a <sup>4</sup> KP21 of the Marine Cable Corridor. endix 6.2 of ES) indicate that, at this SAC resulting from dredge disposal

uding excavation of HDD pits between any coarse material mobilised deposited e trench). Finer sediment will be depositing throughout the tidal cycle. liberated into the water column and I that deposition will be negligible with er the forcing of tidal flows.

tely 3.3 km from the proposed HDD therefore it is considered that it will be posited. Therefore, any deposition of t adversely affect the integrity of the In cessation of activites normal rates of nd composition of communities, or on the cted.

cted to result from the Proposed ch may result in in combination effects are it is considered that there is no potential on deposition of sediment (smothering).

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
	the distribution of qualifying species within the site	Pollution	Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from vessels may However, routine mitigation measures of standard best management, pollution prevention measures (Section will make the likelihood of these events occurring highly adverse effects on Site integrity. Given the scale and nature of other potential plans and to similar best practice measures which could contribut predicted that there will be no adverse effect on site integrity and projects.
		Pollution	Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	
		Increased SSC	Supporting processes: water quality - DO	Maintain the DO concentration [at / to] levels equating to [Good / High] Ecological Status [(specifically $\ge$ XX mg per litre (at 35 salinity) for 95 % of the year)], avoiding deterioration from existing levels.	Mitigation is proposed to restrict sediment disposal actions buffer of 3 km). Results of sediment plume dispersion in that, at this distance, there will be no connectivity between and the SAC resulting from the disposal of dredge maters are considered to be excavation of dredged maters and to increased SSC are considered to be excavation KP1.6), and cable installation (due to the potential for the identified between KP 5 and 15, and in other isolated to the cable trench or HDD pit) and these concentrations hours following completion of construction activities. Set



y occur during all development phases. est practice in terms of waste in 10.2.5) and strict navigational protocols hly unlikely and therefore will not result in

nd projects and the requirement to adhere ute to in combination effects, it is ntegrity in combination with other plans

ctivities to outwith WFD waters (plus a n modelling (Appendix 6.2 of ES) indicate ween increased SSC / sediment plumes aterial.

aterial, the worst-case activities which will on at the HDD pit(s) (between KP1 and the liberation and dispersal of fines locations).

be observed locally (i.e. within 2 km of could potentially persist for several Sediment plumes are also likely to be

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Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
		Increased SSC	Supporting processes: water quality – nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features	transported up to 5 km away from the trench or pit at with 1 are predicted. SSC is expected to return to background completion of these activities. The finest sediments will potentially be transported up to however it is highly likely that SSCs at these distances discernible above natural variation. Natural Variation ranges from approximately <5 to 75 m averages of between 5 – 15 mgl-1 observed within surfat Most habitats present within reef environments are not those that are sensitive considered tolerant to such sho experienced as a result of the Proposed Development of Therefore, it is considered that there will be no adverse SSC on reef features. On cessation of activites, normal and no significant effects on distribution and composition
	Increased SSCDistribution: presence and spatial distribution of biological communitiesMaintain the presence and spatial distribution of intertidal rock communities according to the map.Increased SSCStructure: species composition of component communitiesMaintain the species composition of composition of component component	inorganic nitrogen, are predicted. Considering the very small and localised effects predic Development, the general lack of sensitivity to the imp which may result in in combination effects are likely to magnitude, it is considered that there will be no advers combination increases in SSC.			
		species composition of			
		Increased SSC	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material)	



which point concentrations of 5 to 10 mglound levels within a few days following

o to 6-10 km in the nearshore area, es will be low (< 5 mgl-1) and therefore not

mgl-1 in coastal areas, with annual urface waters.

bt sensitive to increases in SSC, with hort-term isolated events as would be at (see sub-feature assessments below). se effects on site integrity from increased hal levels of turbidity and DO will return, ition of communities, or on the levels of

icted as a result of the Proposed pact, and the fact that all other activities o be similar or lesser in extent and rse effects on site integrity from in

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
				across the habitat.	
Circalittoral Rock	Ŭ	Invasive Species	Structure: non-native species and pathogens	Restrict the introduction and spread of non- native species and pathogens, and their impacts.	Application of best practice plans and procedures (see contractors and vessels. This will reduce the potential far as is reasonably practicable and will ensure that the on integrity on the site as a result of invasive species. Due to the lack of predicted effects, along with the app measures employed for any other plan and project ide combination adverse effects will arise on this feature a
		Deposition of sediment	Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sediment disposal act buffer of 3 km); which equates to disposal seaward of Results of sediment plume dispersion modelling (Appe distance, there no will be sediment deposition with the
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	activities. Deposition from other cable installation activities (inclue KP1 and KP1.6) is not predicted to be significant, with rapidly (i.e. within several hundred metres of the cable dispersed across a greater spatial extent, transiently d However, due to the volumes of sediment likely to be lis significant dispersion of fine sediment, it is considered
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	sediments quickly resuspended and redistributed unde The closest Reef feature within the SAC is approximate entry/exit pits (at their closest possible location), and the outwith the area where the majority of sediment is dep sediment will be light, temporary in nature and will not
		Deposition of Sediment (Smothering)	Structure: physical structure of rocky substrate	Maintain the surface and structural complexity, and the stability of the reef structure.	feature which is not sensitive to effects at this level. Or deposition will return, and no effects on distribution and availability or structural integrity of features, are predic Considering the very small and localised effects predic Development, and the fact that all other activities which likely to be similar or lesser in extent and magnitude, it adverse effects on site integrity from in combination efficiency.



ee section 10.2.5) will be followed by all al for introduction of INIS introduction as here are is no potential for adverse effects

oplication of any similar best practice lentified, it is considered that no in as a result of invasive species.

ctivities to outwith WFD waters (plus a of KP21 of the Marine Cable Corridor. pendix 6.2 of ES) indicate that, at this he SAC resulting from dredge disposal

Adding excavation of HDD pits between th any coarse material mobilised deposited le trench). Finer sediment will be depositing throughout the tidal cycle. The liberated into the water column and ad that deposition will be negligible with der the forcing of tidal flows.

ately 3.3 km from the proposed HDD therefore it is considered that it will be eposited. Therefore, any deposition of ot adversely affect the integrity of the On cessation of activites normal rates of and composition of communities, or on the licted.

dicted to result from the Proposed ich may result in in combination effects are it is considered that there will be no effects of deposition of sediment

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Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
	the distribution of qualifying species within the site	Increased SSC	Supporting processes: water quality - DO	Maintain the DO concentration [at / to] levels equating to [Good / High] Ecological Status [(specifically $\ge$ XX mg per litre (at 35 salinity) for 95 % of the year)], avoiding deterioration from existing levels.	Mitigation is proposed to restrict sediment disposal act buffer of 3 km). Results of sediment plume dispersion that, at this distance, there will be no connectivity betw and the SAC resulting from the disposal of dredge mat For activities other than the deposition of dredged mate lead to increased SSC are considered to be excavation KP1.6), and cable installation (due to the potential for t identified between KP 5 and 15, and in other isolated k It is predicted that peak SSCs of up to 200 mgl-1 may the cable trench or HDD pit) and these concentrations
		Increased SSC	Supporting processes: water quality – nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features	<ul> <li>hours following completion of construction activities. Set transported up to 5 km away from the trench or pit at w 1 are predicted. SSC is expected to return to backgrou completion of these activities.</li> <li>The finest sediments will potentially be transported up however it is highly likely that SSCs at these distances discernible above natural variation. Natural Variation ratin coastal areas, with annual averages of between 5 – waters.</li> <li>The closest Reef feature within the SAC is approximate entry/exit pits (at their closest possible location), and the outwith the area of highest SSC. Increases in SSC care species and can increase scour in tide swept areas (Reel levels of sediment at the location of this subfeature are within the natural background concentrations present, and the set of sediment at the location of this subfeature area.</li> </ul>
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	be well adapted to this level of effect. As such, although associated with cleaning of feeding apparatus, no sign composition or abundances are considered likely to ari Therefore, it is considered that there will be no adverse SSC on reef features. On cessation of activites, norma and no significant effects on the levels of inorganic nitre



ctivities to outwith WFD waters (plus a modelling (Appendix 6.2 of ES) indicate ween increased SSC / sediment plumes aterial.

terial, the worst-case activities which will on at the HDD pit(s) (between KP1 and the liberation and dispersal of fines locations).

be observed locally (i.e. within 2 km of could potentially persist for several Sediment plumes are also likely to be which point concentrations of 5 to 10 mglund levels within a few days following

p to 6-10 km in the nearshore area, es will be low (< 5 mgl-1) and therefore not ranges from approximately <5 to 75 mgl-1 – 15 mgl-1 observed within surface

ately 3.3 km from the proposed HDD therefore it is considered that it will be an affect feeding efficiency of filter feeding Readman, 2016). The likely received re however likely to be very similar or , and as such the communites are likely to gh there may be some energetic cost unificant changes in community arise.

se effects on site integrity from increased al levels of turbidity and DO will return, trogen are predicted.

WSP/Natural Power

Feature/Sub- features Conservation Objective		Effect	Attribute taken through to AA	Target	Assessment
		Increased SSC	Structure: species composition of component communities	Maintain the species composition of component communities.	Considering the very small and localised effects predic Development, the general lack of sensitivity to the impo- which may result in in combination effects are likely to magnitude, it is considered that there will be no advers combination effects from increases in SSC.
		Increased SSC	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	
habitats and hal of the qualifying species the structure and function (includin typical species) qualifying natura habitats	restoring: the extent and distribution of qualifying natural habitats and habitats	Invasive Species	Structure: non-native species and pathogens	Restrict the introduction and spread of non- native species and pathogens, and their impacts.	Application of best practice plans and procedures (see contractors and vessels. This will reduce the potential f far as is reasonably practicable and will ensure that the on integrity on the site as a result of invasive species. Due to the lack of predicted effects, along with the app measures employed for any other plan and project idea combination adverse effects will arise on this feature as
		Deposition of sediment	Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sediment disposal action buffer of 3 km); which equates to disposal seaward of 1 Results of sediment plume dispersion modelling (Appendistance, there no will be sediment deposition with the
	the structure and function of the	Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	activities. Deposition from other cable installation activities (incl KP1 and KP1.6) is not predicted to be significant, with rapidly (i.e. within several hundred metres of the cabl dispersed across a greater spatial extent, transiently However, due to the volumes of sediment likely to be



dicted as a result of the Proposed npact, and the fact that all other activities to be similar or lesser in extent and erse effects on site integrity from in

ee section 10.2.5) will be followed by all al for introduction of INIS introduction as there are is no potential for adverse effects

pplication of any similar best practice dentified, it is considered that no in as a result of invasive species.

ctivities to outwith WFD waters (plus a of KP21 of the Marine Cable Corridor. pendix 6.2 of ES) indicate that, at this he SAC resulting from dredge disposal

luding excavation of HDD pits between th any coarse material mobilised deposited le trench). Finer sediment will be depositing throughout the tidal cycle. e liberated into the water column and

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
	qualifying species the supporting processes on which qualifying natural	Deposition of Sediment (Smothering)	Structure: species composition of component communities	Maintain the species composition of component communities.	significant dispersion of fine sediment, it is considered sediments quickly resuspended and redistributed unde The closest Reef feature within the SAC is approximat entry/exit pits (at their closest possible location), and the outwith the area where the majority of sediment is dep
	<ul><li>habitats and the habitats of qualifying species rely</li><li>the populations of each of the qualifying species</li><li>the distribution of qualifying species within the site</li></ul>	Deposition of Sediment (Smothering)	Structure: physical structure of rocky substrate	Maintain the surface and structural complexity, and the stability of the reef structure.	sediment will be light, temporary in nature and will not feature which is not sensitive to effects at this level. Or deposition will return, and no effects on distribution and availability or structural integrity of features, are predic Considering the very small and localised effects predic Development, and the fact that all other activities which likely to be similar or lesser in extent and magnitude, it adverse effects on site integrity from in combination de alone or in combination with other project and plans.
		Pollution	Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from vessels may However, routine mitigation measures of standard bes management, pollution prevention measures (Section will make the likelihood of these events occurring high adverse effects on Site integrity. Given the scale and nature of other potential plans and to similar best practice measures which could contribut predicted that there will be no adverse effect on site in and projects.
		Increased SSC	Supporting processes: water quality - DO	Maintain the DO concentration [at / to] levels equating to [Good / High] Ecological Status [(specifically $\ge XX$ mg per litre (at 35 salinity) for 95 % of the year)],	Mitigation is proposed to restrict sediment disposal act buffer of 3 km). Results of sediment plume dispersion that, at this distance, there will be no connectivity betw and the SAC resulting from the disposal of dredge mat For activities other than the deposition of dredged mate lead to increased SSC are considered to be excavation KP1.6), and cable installation (due to the potential for identified between KP 5 and 15, and in other isolated b



ed that deposition will be negligible with der the forcing of tidal flows.

ately 3.3 km from the proposed HDD therefore it is considered that it will be eposited. Therefore, any deposition of ot adversely affect the integrity of the On cessation of activites normal rates of ind composition of communities, or on the icted.

licted to result from the Proposed ch may result in in combination effects are it is considered that there will be no deposition of sediment (smothering), either

y occur during all development phases. est practice in terms of waste n 10.2.5) and strict navigational protocols hly unlikely and therefore will not result in

nd projects and the requirement to adhere oute to in combination effects, it is integrity in combination with other plans

ctivities to outwith WFD waters (plus a n modelling (Appendix 6.2 of ES) indicate ween increased SSC / sediment plumes aterial.

aterial, the worst-case activities which will on at the HDD pit(s) (between KP1 and r the liberation and dispersal of fines I locations).

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
				avoiding deterioration from existing levels.	It is predicted that peak SSCs of up to 200 mgl-1 may be the cable trench or HDD pit) and these concentrations of hours following completion of construction activities. Set transported up to 5 km away from the trench or pit at we 1 are predicted. SSC is expected to return to backgroup
	Increased SSC Increased SSC Increased SSC Increased SSC Increased SSC		Supporting processes: water quality – nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features	<ul> <li>1 are predicted. SSC is expected to return to backgrour completion of these activities.</li> <li>The finest sediments will potentially be transported up the however it is highly likely that SSCs at these distances discernible above natural variation. Natural Variation ration coastal areas, with annual averages of between 5 – waters.</li> <li>The closest Reef feature within the SAC is approximated entry/exit pits (at their closest possible location), and the outwith the area of highest SSC. Increases in SSC can species and can increase scour in tide swept areas (Reel levels of sediment at the location of this subfeature are within the natural background concentrations present, a be well adapted to this level of effect. As such, although associated with cleaning of feeding apparatus, no significant.</li> </ul>
			Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	composition or abundances are considered likely to Therefore, it is considered that there will be no adve SSC on reef features. On cessation of activites, witil will return, and no effects on the levels of inorganic r Considering the very small and localised effects pre- Development, the general lack of sensitivity to the in which may result in in combination effects are likely
			Structure: species composition of component communities	Maintain the species composition of component communities.	magnitude, it is considered that there will be no adverse combination effects from increases in SSC.
			Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg	



be observed locally (i.e. within 2 km of could potentially persist for several Sediment plumes are also likely to be which point concentrations of 5 to 10 mglund levels within a few days following

o to 6-10 km in the nearshore area, s will be low (< 5 mgl-1) and therefore not ranges from approximately <5 to 75 mgl-1 - 15 mgl-1 observed within surface

tely 3.3 km from the proposed HDD therefore it is considered that it will be an affect feeding efficiency of filter feeding Readman, 2016). The likely received re however likely to be very similar or , and as such the communites are likely to gh there may be some energetic cost nificant changes in community rise.

se effects on site integrity from increased days normal levels of turbidity and DO trogen are predicted.

icted as a result of the Proposed bact, and the fact that all other activities be similar or lesser in extent and se effects on site integrity from in

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
				concentrations of suspended sediment, plankton and other material) across the habitat.	
Intertidal       maintaining or         Rock       restoring:         the extent and       distribution of         qualifying natural       habitats and habitats	restoring: the extent and distribution of qualifying natural habitats and habitats	Invasive Species	Structure: non-native species and pathogens	Restrict the introduction and spread of non- native species and pathogens, and their impacts.	Application of best practice plans and procedures (see contractors and vessels. This will reduce the potential far as is reasonably practicable and will ensure that the on integrity on the site as a result of invasive species. Due to the lack of predicted effects, along with the app measures employed for any other plan and project ide combination adverse effects will arise on this feature a
	of the qualifying species the structure and function (including	Deposition of sediment	Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sediment disposal ac buffer of 3 km); which equates to disposal seaward of Results of sediment plume dispersion modelling (Appe distance, there no will be sediment deposition with the
	typical species) of qualifying natural habitats the structure and function of the habitats of the	Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	activities. Deposition from other cable installation activities (inclu KP1 and KP1.6) is not predicted to be significant, with rapidly (i.e. within several hundred metres of the cable dispersed across a greater spatial extent, transiently of However, due to the volumes of sediment likely to be li- significant dispersion of fine sediment, it is considered
qualifying species the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely the populations of	the supporting processes on which qualifying natural	Deposition of Sediment (Smothering)	Structure: species composition of component communities	Maintain the species composition of component communities.	sediments quickly resuspended and redistributed under The closest intertidal rock habitat within the SAC is ap HDD entry/exit pits (at their closest possible location), be outwith the area where any sediment is deposited. Sediment deposition will therefore not adversely affect
	Deposition of Sediment (Smothering)	Structure: phsyical structure of rocky substrate	Maintain the surface and structural complexity, and	are considered possible. In addition, due to the fact the project alone through deposition of sediment, no in-corpossible.	



ee section 10.2.5) will be followed by all al for introduction of INIS introduction as here are is no potential for adverse effects

pplication of any similar best practice lentified, it is considered that no in as a result of invasive species.

activities to outwith WFD waters (plus a of KP21 of the Marine Cable Corridor. pendix 6.2 of ES) indicate that, at this ne SAC resulting from dredge disposal

cluding excavation of HDD pits between th any coarse material mobilised deposited le trench). Finer sediment will be depositing throughout the tidal cycle. e liberated into the water column and ed that deposition will be negligible with der the forcing of tidal flows.

pproximately 10 km from the proposed , and therefore it is considered that it will

ct the integrity of the feature as no effects that no effects are predicted from the combination adverse effects are considered

WSP/Natural Power

Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
each of the qualifying species			the stability of the reef structure	
the distribution of qualifying species within the site	Pollution	Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemical spillages from vessels may However, routine mitigation measures of standard best management, pollution prevention measures (Section will make the likelihood of these events occurring high adverse effects on Site integrity. Given the scale and nature of other potential plans and to similar best practice measures which could contribut predicted that there will be no adverse effect on site integrity and projects.
	Increased SSC	Supporting processes: water quality - DO	Maintain the DO concentration [at / to] levels equating to [Good / High] Ecological Status [(specifically $\ge$ XX mg per litre (at 35 salinity) for 95 % of the year)], avoiding deterioration from existing levels.	Mitigation is proposed to restrict sediment disposal act buffer of 3 km). Results of sediment plume dispersion this distance, there will be no connectivity from increase For activities other than the deposition of dredged mate lead to increased SSC are considered to be excavation (due to the potential for the liberation and dispersal of and in other isolated locations). It is predicted that peak SSCs of up to 200 mgl-1 may the cable trench or HDD pit) and these concentrations hours following completion of construction activities. So transported up to 5 km away from the trench or pit at w
	Increased SSC	Supporting processes: water quality – nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and	<ul> <li>1 are predicted. SSC is expected to return to backgrou completion of these activities.</li> <li>The finest sediments will potentially be transported up however it is highly likely that SSCs at these distances discernible above natural variation.</li> <li>The closest intertidal rock habitat within the SAC is app HDD entry/exit pits (at their closest possible location), be outwith the area of significantly increased SSC, with within the natural background of variation present. Nature 1</li> </ul>



y occur during all development phases. est practice in terms of waste n 10.2.5) and strict navigational protocols phy unlikely and therefore will not result in

nd projects and the requirement to adhere oute to in combination effects, it is integrity in combination with other plans

activities to outwith WFD waters (plus a in modelling (Appendix 6.2) indicate that, at ased SSC with the SAC.

aterial, the worst-case activities which will on at the HDD pits, and cable installation of fines identified between KP 5 and 15,

y be observed locally (i.e. within 2 km of s could potentially persist for several Sediment plumes are also likely to be t which point concentrations of 5 to 10 mglound levels within a few days following

ip to 6-10 km in the nearshore area, es will be low (< 5 mgl-1) and therefore not

pproximately 10 km from the proposed , and therefore it is considered that it will ith any received levels not discernable atural Variation ranges from approximately

WSP/Natural Power

	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
				phytoplankton blooms) do not affect the integrity of the site and features	<5 to 75 mgl-1 in coastal areas, with annual averages surface waters. Considering the received levels predic composition or distributions are predicted, and according feature are predicted. As the received levels will be with typically experienced, no effects on turbidity or DO areas.
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	and composition of communities, or on the levels of ind Considering the very small effects predicted as a result of sensitivity to the impact, and the fact that all other are combination effects are likely to be similar or lesser in that there will be no adverse effects on site integrity from in SSC.
		Increased SSC	Structure: species composition of component communities	Maintain the species composition of component communities.	
		Increased SSC	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	
Subtidal stony reef	maintaining or restoring: the extent and distribution of qualifying natural habitats and habitats	Invasive Species	Structure: non-native species and pathogens	Restrict the introduction and spread of non- native species and pathogens, and their impacts.	Application of best practice plans and procedures (see contractors and vessels. This will reduce the potential far as is reasonably practicable and will ensure that the on integrity on the site as a result of invasive species. Due to the lack of predicted effects, along with the app measures employed for any other plan and project ide combination adverse effects will arise on this feature a



es of between 5 – 15 mgl-1 observed within licted, no changes to community rdingly no effects on the integrity of the within the natural background of SSC are predicted, and no effects on distribution inorganic nitrogen, are envisaged.

sult of the Proposed Development, the lack activities which may result in in in extent and magnitude, it is considered from in combination effects from increases

ee section 10.2.5) will be followed by all al for introduction of INIS introduction as there are is no potential for adverse effects

pplication of any similar best practice dentified, it is considered that no in as a result of invasive species.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
	of the qualifying species the structure and	Deposition of sediment	Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sediment disposal act buffer of 3 km); which equates to disposal seaward of Results of sediment plume dispersion modelling (Appendistance, there no will be sediment deposition with the
	function (including typical species) of qualifying natural habitats the structure and function of the habitats of the	Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	activities. Deposition from other cable installation activities (inclue KP1 and KP1.6) is not predicted to be significant, with rapidly (i.e. within several hundred metres of the cable dispersed across a greater spatial extent, transiently d However, due to the volumes of sediment likely to be lis significant dispersion of fine sediment, it is considered
qualifying species the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely the populations of each of the qualifying species	the supporting processes on which qualifying natural	Deposition of Sediment (Smothering)	Structure: species composition of component communities	Maintain the species composition of component communities.	sediments quickly resuspended and redistributed under The closest Reef feature within the SAC is approximate entry/exit pits (at their closest possible location), and the outwith the area where the majority of sediment is deposed sediment will be light, temporary in nature and will not
	<ul><li>habitats of qualifying species rely</li><li>the populations of each of the qualifying</li></ul>	itats of qualifying cies rely Deposition of Sediment (Smothering) populations of h of the qualifying cies	Structure: phsyical structure of rocky substrate	Maintain the surface and structural complexity, and the stability of the reef structure.	feature which is not sensitive to effects at this level. Or deposition will return, and no effects on distribution and availability or structural integrity of features, are predic Considering the very small and localised effects predic Development, and the fact that all other activities which likely to be similar or lesser in extent and magnitude, it adverse effects on site integrity from in combination efficiency.
	qualifying species within the site	Pollution	Supporting processes: water quality - contaminants	Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding	Unplanned oil or chemical spillages from vessels may However, routine mitigation measures of standard best management, pollution prevention measures (Section will make the likelihood of these events occurring highly adverse effects on Site integrity. Given the scale and nature of other potential plans and to similar best practice measures which could contribut predicted that there will be no adverse effect on site integrity and projects.



tivities to outwith WFD waters (plus a f KP21 of the Marine Cable Corridor. endix 6.2 of ES) indicate that, at this e SAC resulting from dredge disposal

uding excavation of HDD pits between any coarse material mobilised deposited e trench). Finer sediment will be depositing throughout the tidal cycle. liberated into the water column and d that deposition will be negligible with er the forcing of tidal flows.

tely 3.3 km from the proposed HDD therefore it is considered that it will be posited. Therefore, any deposition of t adversely affect the integrity of the On cessation of activites normal rates of nd composition of communities, or on the cted.

icted to result from the Proposed ch may result in in combination effects are it is considered that there will be no effects from deposition of sediment

v occur during all development phases. st practice in terms of waste a 10.2.5) and strict navigational protocols any unlikely and therefore will not result in

nd projects and the requirement to adhere ute to in combination effects, it is ntegrity in combination with other plans

WSP/Natural Power

Features       Conservation Objective		Effect	Attribute taken through to AA	Target	Assessment
			deterioration from existing levels.		
		Increased SSC	Supporting processes: water quality - DO	Maintain the DO concentration [at / to] levels equating to [Good / High] Ecological Status [(specifically $\ge$ XX mg per litre (at 35 salinity) for 95 % of the year)], avoiding deterioration from existing levels.	Mitigation is proposed to restrict sediment disposal actions buffer of 3 km). Results of sediment plume dispersion in that, at this distance, there will be no connectivity between and the SAC resulting from the disposal of dredge maters and the SAC resulting from the disposal of dredge maters for activities other than the deposition of dredged maters lead to increased SSC are considered to be excavation KP1.6), and cable installation (due to the potential for the identified between KP 5 and 15, and in other isolated lead to increase that peak SSCs of up to 200 mgl-1 may be the cable trench or HDD pit) and these concentrations hours following completion of construction activities. Set
		Increased SSC	Supporting processes: water quality – nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features	transported up to 5 km away from the trench or pit at w 1 are predicted. SSC is expected to return to backgroun completion of these activities. The finest sediments will potentially be transported up the however it is highly likely that SSCs at these distances discernible above natural variation. Natural Variation ra- in coastal areas, with annual averages of between 5 – waters. The closest Reef feature within the SAC is approximate entry/exit pits (at their closest possible location), and the outwith the area of highest SSC. Increases in SSC can affect feeding efficiency of filter f in tide swept areas (Readman, 2016). The likely receive this subfeature are however likely to be very similar or concentrations present, and as such the communites a
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	of effect. As such, although there may be some energe feeding apparatus, no significant changes in community considered likely to arise. Therefore, it is considered that there will be no effects of reef features. On cessation of activites, normal levels of effects on the levels of inorganic nitrogen are predicted



ctivities to outwith WFD waters (plus a modelling (Appendix 6.2 of ES) indicate ween increased SSC / sediment plumes aterial.

terial, the worst-case activities which will on at the HDD pit(s) (between KP1 and the liberation and dispersal of fines locations).

be observed locally (i.e. within 2 km of s could potentially persist for several Sediment plumes are also likely to be which point concentrations of 5 to 10 mglund levels within a few days following

o to 6-10 km in the nearshore area, s will be low (< 5 mgl-1) and therefore not ranges from approximately <5 to 75 mgl-1 - 15 mgl-1 observed within surface

tely 3.3 km from the proposed HDD therefore it is considered that it will be

r feeding species and can increase scour ived levels of sediment at the location of r within the natural background are likely to be well adapted to this level getic cost associated with cleaning of ity composition or abundances are

s on site integrity from increased SSC on of turbidity and DO will return, and no ed.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
		Increased SSC	Structure: species composition of component communities	Maintain the species composition of component communities.	Considering the very small and localised effects predic Development, the general lack of sensitivity to the imp which may result in in combination effects are likely to magnitude, it is considered that there will be no advers combination increases in SSC.
		Increased SSC	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.	
or partially submerged sea caves th di qu ha of sp th fu ty qu ha th	<ul> <li>maintaining or restoring:</li> <li>the extent and distribution of qualifying natural habitats and habitats of the qualifying species</li> <li>the structure and function (including typical species) of qualifying natural habitats</li> <li>the structure and function of the habitats</li> </ul>	Invasive species	Structure: non-native species and pathogens	Restrict the introduction and spread of non- native species and pathogens, and their impacts.	Application of best practice plans and procedures (see contractors and vessels. This will reduce the potential far as is reasonably practicable and will ensure that the on integrity on the site as a result of invasive species. Due to the lack of predicted effects, along with the app measures employed for any other plan and project ide combination adverse effects will arise on this feature a
		Pollution	Supporting processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the feature.	Unplanned oil or chemical spillages from vessels may However, routine mitigation measures of standard best management, pollution prevention measures (Section will make the likelihood of these events occurring highl adverse effects on Site integrity. Given the scale and nature of other potential plans and to similar best practice measures which could contribut predicted that there will be no adverse effect on site in and projects.
		Pollution	Supporting processes: water	Restrict aqueous contaminants to levels equating to	



dicted as a result of the Proposed npact, and the fact that all other activities to be similar or lesser in extent and erse effects on site integrity from in

ee section 10.2.5) will be followed by all al for introduction of INIS introduction as there are is no potential for adverse effects

pplication of any similar best practice dentified, it is considered that no in as a result of invasive species.

ay occur during all development phases. est practice in terms of waste in 10.2.5) and strict navigational protocols phy unlikely and therefore will not result in

and projects and the requirement to adhere bute to in combination effects, it is integrity in combination with other plans

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
	the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely the populations of each of the qualifying		quality - contaminants	High Status according to Annex VIII and Good Status according to Annex X of the WFD, avoiding deterioration from existing levels.	
	species the distribution of qualifying species within the site	Deposition of Sediment (Smothering)	Supporting processes: sedimentation rate	Maintain the natural rate of sediment deposition.	Mitigation is proposed to restrict sediment disposal act buffer of 3 km); which equates to disposal seaward of Results of sediment plume dispersion modelling (Appen distance, there no will be sediment deposition with the
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of sea cave communities according to the map.	activities. Deposition from other cable installation activities (inclue KP1 and KP1.6) is not predicted to be significant, with rapidly (i.e. within several hundred metres of the cable dispersed across a greater spatial extent, transiently d However, due to the volumes of sediment likely to be li
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Maintain the species composition of component communities.	significant dispersion of fine sediment, it is considered sediments quickly resuspended and redistributed unde The closest Submerged or partially submerged sea ca
		Deposition of Sediment (Smothering)	Structure: physical structure of rocky substrate	Maintain the surface and structural complexity, and the stability of the rocky structure within the cave.	approximately 10 km from the proposed HDD entry/exit and therefore it is considered that it will be outwith the Sediment deposition will therefore not adversely affect are considered possible. In addition, due to the fact that project alone through deposition of sediment, no in-corpossible.



activities to outwith WFD waters (plus a of KP21 of the Marine Cable Corridor. pendix 6.2 of ES) indicate that, at this ne SAC resulting from dredge disposal

Eluding excavation of HDD pits between th any coarse material mobilised deposited ble trench). Finer sediment will be depositing throughout the tidal cycle. The liberated into the water column and ed that deposition will be negligible with der the forcing of tidal flows.

caves feature within the SAC is exit pits (at their closest possible location), he area where any sediment is deposited.

ct the integrity of the feature as no effects that no effects are predicted from the combination adverse effects are considered

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	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
		Increased SSC	Supporting processes: water quality - DO	Maintain the DO concentration [at / to] levels equating to [Good / High] Ecological Status [(specifically $\ge$ XX mg per litre (at 35 salinity) for 95 % of the year)], avoiding deterioration from existing levels.	Mitigation is proposed to restrict sediment disposal acti buffer of 3 km). Results of sediment plume dispersion r this distance, there will be no connectivity from increase For activities other than the deposition of dredged mate lead to increased SSC are considered to be excavation (due to the potential for the liberation and dispersal of f and in other isolated locations). It is predicted that peak SSCs of up to 200 mgl-1 may be the cable trench or HDD pit) and these concentrations of hours following completion of construction activities. Set transported up to 5 km away from the trench or pit at w
		Increased SSC	Supporting processes: water quality – nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels.	<ul> <li>1 are predicted. SSC is expected to return to backgroun completion of these activities.</li> <li>The finest sediments will potentially be transported up to however it is highly likely that SSCs at these distances discernible above natural variation.</li> <li>The closest Submerged or partially submerged sea cave approximately 10 km from the proposed HDD entry/exit and therefore it is considered that it will be outwith the a any received levels not discernable within the natural be Variation ranges from approximately &lt;5 to 75 mgl-1 in between 5 – 15 mgl-1 observed within surface waters. cave habitats are not sensitive or have low sensitivity to received levels predicted, no effects on the integrity of the received levels are predicted to be within the natural between 5 or 0.000 are predicted, and no effect of the proposal predicted, and no effect of the proposal predicted as a result of the proposal predicted as a result of the proposal predicted as a result of the proposal predicted as a result.</li> </ul>
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map	Considering the very small effects predicted as a result of sensitivity to the impact, and the fact that all other ac combination effects are likely to be similar or lesser in e that there will be no adverse effects on site integrity fro in SSC.



ctivities to outwith WFD waters (plus a modelling (Appendix 6.2) indicate that, at used SSC with the SAC.

terial, the worst-case activities which will on at the HDD pits, and cable installation f fines identified between KP 5 and 15,

be observed locally (i.e. within 2 km of s could potentially persist for several Sediment plumes are also likely to be which point concentrations of 5 to 10 mglund levels within a few days following

to 6-10 km in the nearshore area, s will be low (< 5 mgl-1) and therefore not

aves feature within the SAC is kit pits (at their closest possible location), e area of significantly increased SSC, with background of variation present. Natural in coastal areas, with annual averages of 5. Submerged and partially submerged to increases in SSC, and considering the f the feature are predicted. As the background of SSC typically experienced, fects on distribution and composition of re envisaged.

ult of the Proposed Development, the lack activities which may result in in n extent and magnitude, it is considered rom in combination effects from increases

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onservation Effect	Attribute taken through to AA	Target
Increased SSC	Structure: species composition of component communities	Maintain the species composition of component communities.
Increased SSC	Supporting processes: water quality - turbidity	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.

Conclusion: No significant adverse effect on site integrity can be concluded for the South wight maritime SAC, arising from either the Proposed Development alone, or in combination with other plans or projects.



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# 10.12. RIVER ITCHEN SAC

#### 10.12.1. **OVERVIEW**

- 10.12.1.1. The River Itchen SAC covers approximately 310 hectares of classic chalk river. It stretches from Swaithing in Southampton to New Alresford. The SAC does not overlap the Marine Cable Corridor and is 27.5 km distant at its closest point.
- 10.12.1.2. The site is designated for mainly freshwater riverine habitats and species however salmon which spend a large proportion of their adult life at sea are also listed as a qualifying species.

#### 10.12.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.12.2.1. A site-specific Conservation Objectives and Supplementary Advice document is available for the River Itchen SAC<sup>44</sup>. Table 10-21 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

# Table 10.16 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Salmon	Increased SSC	Population: Adult run size Population: Juvenile densities Supporting habitat: Biological connectivity Supporting processes: integrity of off-site habitats
	Pollution Events	Population: Adult run size Population: Juvenile densities Supporting habitat: Biological connectivity Supporting processes: integrity of off-site habitats

- 10.12.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:
  - Population: spawning distribution;

<sup>&</sup>lt;sup>44</sup> <u>http://publications.naturalengland.org.uk/publication/5130124110331904</u> (Accessed: 15 October 2019)



- Supporting habitat: distribution of supporting habitat;
- Supporting habitat: Extent of supporting habitat;
- Supporting habitat: Biotope mosaic;
- Supporting habitat: flow regime;
- Supporting habitat: Riparian zone;
- Supporting habitat: sediment regime;
- Supporting habitat: soils, substrate and nutrient recycling;
- Supporting habitat: thermal regime;
- Supporting habitat: vegetation composition: invasive non-native species;
- Supporting habitat: water quality acidification;
- Supporting habitat: water quality nutrients;
- Supporting habitat: woody debris;
- Supporting processes: adaption and resilience;
- Supporting processes: air quality;
- Supporting processes: conservation measures;
- Supporting processes: control of livestock grazing activity;
- Supporting processes: fisheries exploitation;
- Supporting processes: fisheries introduction of fish species;
- Supporting processes: fisheries introduction of salmon;
- Supporting processes: screening of intakes and discharges;
- Supporting processes: vegetation structure: cover of submerged macrophytes; and
- Supporting processes: water quantity/quality.

# 10.12.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.12.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-22 below.
- 10.12.3.2. It is concluded that there will be no adverse effects on site integrity for the River Itchen SAC, either from the Proposed Development alone, or in combination with other plans or projects.

# Table 10-22 - Assessment of potential adverse effects on site integrity for the River Itchen SAC across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	The populations of qualifying species	Increased SSC	Population: Adult run size	Restore the population to that expected under un-impacted conditions, allowing for natural fluctuations. This should include a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea winter component. Ensure that the stock exceeds its Conservation Limit in 4 out of 5 years The Conservation Limit indicates the minimum desirable adult spawning stock levels (expressed as annual number of eggs deposited) below which stocks should not be allowed to fall. Conservation limit for the River Itchen is considered to be 1.63 million eggs per year.	The potential impact of increased SSC relatives result of the cable installation and associated activities, route clearance and rock placement nearshore areas. The worst case for increased SSC in the off considered to arise through deposit of dreated sandwave clearance, prior to cable installate SSC of 1000 mgl <sup>-1</sup> could arise within 1 km from release, the passive plume which is generate SSC in the region of approximated of the prevailing flow out to a distance of c. background levels (<1 – 6 mg/l) within the form release for increased SSC in the region of approximated of the prevailing flow out to a distance of c. background levels (<1 – 6 mg/l) within the form release for increased SSC in the negligible of the prevailing flow out to a distance of c. background levels (<1 – 6 mg/l) within the form release for increased SSC in the negligible of the prevailing flow out to a distance of c. background levels (<1 – 6 mg/l) within the form release for increased SSC in the negligible of the prevailing flow out to a distance of c. background levels (<1 – 6 mg/l) within the form release for increased SSC in the negligible of the prevailing flow out to a distance of c. background levels (<1 – 6 mg/l) within the form release for increased SSC in the negligible of the prevalue of the
			Population: Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations	potential for the liberation and dispersal of and in other isolated locations). The marine approx. 1 km off the coast of Eastney (KP susing a backhoe dredger or Mass Flow Exception and is up to 2,700 m <sup>3</sup> . The finest sector
	Supporting habitat: Biological connectivity	habitat: Biological	The movement of characteristic biota should not be artificially constrained.	up to 10 km in the nearshore area, howeve distances will be low (<5 mg/l) and therefore variation, It is predicted that peak SSCs of locally (i.e. within 2 km of the cable trench/h	
	, . , <u>, , , , , , , , , , , , , , , , ,</u>	Suppor process integrity	Supporting processes: integrity of off- site habitats	Habitats beyond the site boundary upon which characteristic biological communities of the site depend should be maintained in a state that does not impair the full expression of the characteristic biota within the site.	could potentially persist for several hours for activities. Sediment plumes are also likely to from the trench/pit at which point concentral SSC is expected to return to background le completion of these activities. Salmon are known to use the coast for mig an increase in SSC could pose a barrier to and long-term response from aquatic biota duration of the exposure. The greatest import



elates to the sediment released as a a ated works such as dredge and disposal ment for both the offshore and

offshore area (seaward of KP21) is edge material which may be required for lation. During dredge disposal, peak in from the release point but coarser on quickly (almost immediately) with is of disposal at each location. Beyond 1 h is transported beyond this is likely to tely 20 mgl<sup>-1</sup>, transported in the direction c. 25km. SSC is predicted to reduce to e timeframe of a few days following

nearshore area (landward of KP 21) is pits, and cable installation (due to the of fines identified between KP 5 and 15, ne HDD exit/entry Landfall location is P 1 – KP 1.6) and will be excavated excavator ('MFE'). The total volume to be ediments will potentially be transported wer it is highly likely that SSCs at these ore not discernible above natural of up to 200 mg/l may be observed h/HDD pit) and these concentrations following completion of construction y to be transported up to 5 km away trations of 5 to 10 mg/l are predicted; levels within a few days following

to their migration. SSCs can elicit a short ta depending on the quantity, quality and spact of suspended sediment on

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					migratory fish is on incubating eggs and lar This, in part, is due to their lack of mobility a impact. Given that salmon spawn in freshwa salmon eggs or larvae. Adult salmon on the responses and are able to swim through or e.g. areas of increased SSC. They are also and variable background levels of suspende also true for smolts as they develop in a rive exposed to increases in suspended sedime off. Therefore, it is considered that there will be from increased SSC on this feature from the Considering the very small and localised eff Proposed Development, the general lack of that all other activities which may result in it similar or lesser in extent and magnitude, it effects on site integrity from in combination
	The populations of qualifying species	Pollution effects	Population: Adult run size	Restore the population to that expected under un-impacted conditions, allowing for natural fluctuations. This should include a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea winter component. Ensure that the stock exceeds its Conservation Limit in 4 out of 5 years The Conservation Limit indicates the minimum desirable adult spawning stock levels (expressed as annual number of eggs deposited) below which stocks should not be allowed to fall. Conservation limit for the River Itchen is considered to be 1.63 million eggs per year.	Unplanned oil or chemical spillages from ver development phases. Spills have the poten and smolts during their spawning or seawar pollution and preference for surface waters. However, routine mitigation measures of sta management, pollution prevention measures navigational protocols will make the likeliho unlikely and therefore will not result in adver Given the scale and nature of other potentia requirement to adhere to similar best practi in combination effects, it is predicted that the integrity in combination with other plans and



arval stages (Robertson *et al.*, 2007). y and inability to move away from the water there is no route to impact on ne other hand exhibit strong swimming or navigate around an impacted area so inherently tolerant of naturally high ded sediment (Heard, 2007). This is iverine environment and are frequently nent due to flood events and land run

be no adverse effects on site integrity the Proposed Development alone.

effects predicted as a result of the of sensitivity to the impact, and the fact in combination effects are likely to be it is considered that will be no adverse n effecst from increases in SSC.

vessels may occur during all ential to directly affect both adult salmon vard migrations given their sensitivity to rs.

standard best practice in terms of waste res (Section 10.2.5) and strict nood of these events occurring highly verse effects on site integrity.

tial plans and projects and the ctice measures which could contribute to there will be no adverse effect on site nd projects.

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
			Population: Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations	
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	The movement of characteristic biota should not be artificially constrained.	
		Supporting processes: integrity of off- site habitats	Habitats beyond the site boundary upon which characteristic biological communities of the site depend should be maintained in a state that does not impair the full expression of the characteristic biota within the site.		

Conclusion: No significant adverse effect on site integrity can be concluded for the River Itchen SAC, arising from either the Proposed Development alone, or in combination with other plans or projects.



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# 10.13. RIVER AVON SAC

## 10.13.1. **OVERVIEW**

- 10.13.1.1. The River Avon SAC covers approximately 498 hectares and comprises the river and its tributaries. It includes sections running through chalk, greenand and clay (English Nature, 2005a). The SAC does not overlap the Marine Cable Corridor and is 51.4 km distant at its closest point.
- 10.13.1.2. The site is designated for mainly freshwater riverine habitats and species however salmon and sea lamprey which spend a large proportion of their adult life at sea are also listed as a qualifying species.

## 10.13.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.13.2.1. A site-specific Conservation Objectives and Supplementary Advice document is available for the River Avon SAC<sup>45</sup> Table 10-23 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

# Table 10.17 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Salmon	Increased SSC	Population: Adult run size Population: Juvenile densities Supporting habitat: Biological connectivity Supporting processes: integrity of off-site habitats
	Pollution Events	Population: Adult run size Population: Juvenile densities Supporting habitat: Biological connectivity Supporting processes: integrity of off-site habitats
Sea lamprey	Increased SSC	Population: population abundance

<sup>45</sup> <u>http://publications.naturalengland.org.uk/publication/6048472272732160</u> (Accessed 16 October 2019)



Feature	Impact for which LSE could not be excluded	Equivalent attribute
		Population: Juvenile densities
		Supporting habitat: Biological connectivity
		Supporting processes: integrity of off-site habitats
	Pollution Events	Population: population abundance
		Population: Juvenile densities
		Supporting habitat: Biological connectivity
		Supporting processes: integrity of off-site habitats

10.13.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:

- Population: spawning distribution;
- Supporting habitat: distribution of supporting habitat;
- Supporting habitat: extent of supporting habitat;
- Supporting habitat: biotope mosaic;
- Supporting habitat: flow regime;
- Supporting habitat: riparian zone;
- Supporting habitat: sediment regime;
- Supporting habitat: thermal regime;
- Supporting habitat: vegetation composition: invasive non-native species;
- Supporting habitat: water quality acidification;
- Supporting habitat: water quality organic pollution
- Supporting habitat: water quality nutrients;
- Supporting habitat: woody debris;
- Supporting habitat: Introduction of fish species;



- Supporting processes: adaption and resilience;
- Supporting processes: air quality;
- Supporting processes: conservation measures;
- Supporting processes: control of livestock grazing activity;
- Supporting processes: fisheries exploitation;
- Supporting processes: fisheries introduction of salmon and/or other fish species;
- Supporting processes: screening of intakes and discharges; and
- Supporting processes: vegetation structure: cover of submerged macrophytes.

### 10.13.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.13.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-24 below.
- 10.13.3.2. It is concluded that there will be no adverse effects on site integrity for the River Avon SAC, either from the Proposed Development alone, or in combination with other plans or projects.

# Table 10.18 - Assessment of potential adverse effects on site integrity for the River Avon SAC across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Sea lamprey	The populations of qualifying species	Increased SSC	Population: Population abundance	Maintain the abundance of the lamprey and bullhead populations at a level which is close to that expected under un-impacted conditions throughout the site (subject to natural habitat conditions and allowing for natural fluctuations), whilst avoiding deterioration from its current level as indicated by the latest count or equivalent.	The potential impact of increased as a result of the cable installation and disposal activities, route clear offshore and nearshore areas. The worst case for increased SSC is considered to arise through dep required for sandwave clearance, disposal, peak SSC of 1000 mgl <sup>-1</sup> point but coarser sediment expect (almost immediately) with significat disposal at each location. Beyond which is transported beyond this is
			Population: Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations.	approximately 20 mgl <sup>-1</sup> , transported out to a distance of c. 25km. SSC i levels (<1 – 6 mg/l) within the timel completion of disposal activities. The worst case for increased SSC 21) is considered to be excavation (due to the potential for the liberation
fund	The structure and function of the habitats of qualifying species		Structure and Function: Biological connectivity	Restore the free movement of the typical species of the SAC feature through the site.	between KP 5 and 15, and in other exit/entry Landfall location is appro- – KP 1.6) and will be excavated us Excavator ('MFE'). The total volum
			Structure and function: Supporting off-site habitat	Maintain habitats beyond the site boundary upon which characteristic biological communities of the SAC may depend	The finest sediments will potentially nearshore area, however it is highly will be low (<5 mg/l) and therefore It is predicted that peak SSCs of up (i.e. within 2 km of the cable trench could potentially persist for several construction activities. Sediment pl up to 5 km away from the trench/pit 10 mg/l are predicted; SSC is expe- within a few days following complete



SSC relates to the sediment released n and associated works such as dredge rance and rock placement for both the

C in the offshore area (seaward of KP21) posit of dredge material which may be prior to cable installation. During dredge could arise within 1 km from the release sted to fall out of suspension quickly cant reductions of SSC within hours of 1 km from release, the passive plume is likely to generate SSC in the region of ed in the direction of the prevailing flow C is predicted to reduce to background eframe of a few days following

C in the nearshore area (landward of KP n at the HDD pits, and cable installation tion and dispersal of fines identified er isolated locations). The marine HDD rox. 1 km off the coast of Eastney (KP 1 using a backhoe dredger or Mass Flow me to be excavated is up to 2,700 m<sup>3</sup>. lly be transported up to 10 km in the hly likely that SSCs at these distances e not discernible above natural variation, up to 200 mg/l may be observed locally :h/HDD pit) and these concentrations al hours following completion of plumes are also likely to be transported bit at which point concentrations of 5 to pected to return to background levels etion of these activities.

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Little is known about adult sea lamp their spawning migration to freshwa increase in suspended sediment co Lamprey are considered to be less than salmonids (Grabarkiewicz and available literature of the effects of limited sea lamprey are known to m (both as adults and transformers) w and the Humber which both natural (FARL, 1995; Marshall and Elliot, 1
					Therefore, it is considered that ther integrity from increased SSC on this Development alone.
					Considering the very small and loca the Proposed development, the gen and the fact that all other activities effects are likely to be similar or less considered that there will be no adv combination effects from increases
	The populations of qualifying species	Pollution events	Population: Population abundance	Maintain the abundance of the lamprey and bullhead populations at a level which is close to that expected under un-impacted conditions throughout the site (subject to natural habitat conditions and allowing for natural fluctuations), whilst avoiding deterioration from its current	Unplanned oil or chemical spillages development phases. Spills have the sea lamprey and transformers durin migrations given their sensitivity to However, routine mitigation measure of waste management, pollution pre- and strict navigational protocols will occurring highly unlikely and therefore Site integrity.
				level as indicated by the latest	Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects
			Population: Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat	adverse effect on site integrity in co



mprey migration whilst at sea. During water there is the possibility that an could pose a barrier to their migration. as sensitive to suspended sediments and Davis 2008). Although publicly of suspended sediment on lamprey is migrate through rivers and estuaries with very high SSC such as the Severn ally contain up to several thousand mg/l 1998).

ere will be no adverse effects on site his feature from the Proposed

calised effects predicted as a result of peneral lack of sensitivity to the impact, s which may result in in combination esser in extent and magnitude, it is dverse effects on site integrity from in es in SSC.

es from vessels may occur during all the potential to directly affect both adult ring their spawning or seaward o pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
				conditions and allowing for natural fluctuations.	
	The structure and function of the habitats of qualifying species		Structure and Function: Biological connectivity	Restore the free movement of the typical species of the SAC feature through the site.	
			Structure and function: Supporting off-site habitat	Maintain habitats beyond the site boundary upon which characteristic biological communities of the SAC may depend	
Salmon	The populations of qualifying species		Population: Adult run size	Restore the population to that expected under un-impacted conditions, allowing for natural fluctuations. This should include a seasonal pattern of migration characteristic of the river and maintenance of the multi- seawinter component. As a minimum, the Conservation Limit for the river system should be complied with. As a minimum, the Conservation Limit for the river system should be complied with.	The potential impact of increased as a result of the cable installation and disposal activities, route clear offshore and nearshore areas. The worst case for increased SSC is considered to arise through dep required for sandwave clearance, disposal, peak SSC of 1000 mgl <sup>-1</sup> point but coarser sediment expect (almost immediately) with significat disposal at each location. Beyond which is transported beyond this is approximately 20 mgl <sup>-1</sup> , transporte out to a distance of c. 25km. SSC levels (<1 – 6 mg/l) within the time completion of disposal activities.
			Population: Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat	21) is considered to be excavation (due to the potential for the liberati between KP 5 and 15, and in other exit/entry Landfall location is appro- KP 1.6) and will be excavated us



d SSC relates to the sediment released on and associated works such as dredge arance and rock placement for both the

SC in the offshore area (seaward of KP21) eposit of dredge material which may be e, prior to cable installation. During dredge <sup>-1</sup> could arise within 1 km from the release cted to fall out of suspension quickly cant reductions of SSC within hours of ad 1 km from release, the passive plume is likely to generate SSC in the region of ted in the direction of the prevailing flow C is predicted to reduce to background neframe of a few days following

SC in the nearshore area (landward of KP on at the HDD pits, and cable installation ation and dispersal of fines identified her isolated locations). The marine HDD prox. 1 km off the coast of Eastney (KP 1 using a backhoe dredger or Mass Flow

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
				conditions and allowing for natural fluctuations	Excavator ('MFE'). The total volume The finest sediments will potentially nearshore area, however it is highly
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	Restore the free movement of the typical species of the SAC feature through the site.	will be low (<5 mg/l) and therefore r It is predicted that peak SSCs of up (i.e. within 2 km of the cable trench/ could potentially persist for several
			Structure and function: Supporting off-site habitat	Maintain habitats beyond the site boundary upon which characteristic biological communities of the SAC may	construction activities. Sediment plu up to 5 km away from the trench/pit 10 mg/l are predicted; SSC is expe- within a few days following complet
				depend	Salmon are known to use the coast possibility that an increase in SSC
					SSCs can elicit a short- and long-tere depending on the quantity, quality a greatest impact of suspended sedine eggs and larval stages (Robertson their lack of mobility and inability to this increased sensitivity it was four and trout juveniles survived for 3-4 1995). Given that salmon spawn in on salmon eggs or larvae. Adult sal swimming responses and are able impacted area e.g. areas of increase tolerant of naturally high and variab sediment (Heard, 2007). This is als riverine environment and are freque suspended sediment due to flood e
					Therefore, it is considered that there integrity from increased SSC on this Development alone.
					Considering the very small and locative Proposed Developments, the grand the fact that all other activities effects are likely to be similar or less considered that there are no adverse combination increases in SSC.



me to be excavated is up to 2,700 m<sup>3</sup>. Ily be transported up to 10 km in the hly likely that SSCs at these distances a not discernible above natural variation, up to 200 mg/l may be observed locally ch/HDD pit) and these concentrations al hours following completion of plumes are also likely to be transported bit at which point concentrations of 5 to bected to return to background levels etion of these activities.

st for migration and there is the C could pose a barrier to their migration.

term response from aquatic biota v and duration of the exposure. The diment on migratory fish is on incubating n *et al.*, 2007). This, in part, is due to to move away from the impact. Despite und that Pacific salmon (*Oncorhynchus*) 4 weeks in SSC of 300-750 mg/l (FARL, in freshwater there is no route to impact salmon on the other hand exhibit strong e to swim through or navigate around an ased SSC. They are also inherently able background levels of suspended also true for smolts as they develop in a uently exposed to increases in events and land run off.

ere will be no adverse effects on site his feature from the Proposed

calised effects predicted as a result of general lack of sensitivity to the impact, s which may result in in combination esser in extent and magnitude, it is erse effects on site integrity from in

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	The populations of qualifying species	Pollution effects	Population: Adult run size	Restore the population to that expected under un-impacted conditions, allowing for natural fluctuations. This should include a seasonal pattern of migration characteristic of the river and maintenance of the multi- seawinter component. As a minimum, the Conservation Limit for the river system should be complied with. As a minimum, the Conservation Limit for the river system should be complied with.	Unplanned oil or chemical spillages development phases. Spills have the salmon and smolts during their space their sensitivity to pollution and prefect However, routine mitigation measure of waste management, pollution pre- and strict navigational protocols will occurring highly unlikely and therefore site integrity. Given the scale and nature of other requirement to adhere to similar best contribute to in combination effects, adverse effect on site integrity in co- projects.
			Population: Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations	
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	Restore the free movement of the typical species of the SAC feature through the site.	
			Structure and function: Supporting off-site habitat	Maintain habitats beyond the site boundary upon which characteristic biological communities of the SAC may depend	



es from vessels may occur during all the potential to directly affect both adult bawning or seaward migrations given eference for surface waters.

ures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Conclusion:	lo significant adverse off	ect on site integrity c	an be concluded for th	A River Avon SAC arising fro	m either the Pronosed Developme

Conclusion: No significant adverse effect on site integrity can be concluded for the River Avon SAC, arising from either the Proposed Development alone, or in combination with other plans or projects.



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# 10.14. RIVER AXE SAC

### 10.14.1. **OVERVIEW**

- 10.14.1.1. The River Axe SAC covers approximately 25 hectares of river catchment. It has mixed geology of sandstones and limestones which gives rise to calcareous waters (English Nature, 2005b). The SAC does not overlap the Marine Cable Corridor and is 168 km distant at its closest point.
- 10.14.1.2. The site is designated for mainly freshwater riverine habitats and species however sea lamprey which spend a large proportion of their adult life at sea are also listed as a qualifying species.

#### 10.14.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.14.2.1. A site-specific Conservation Objectives and Supplementary Advice document is available for the River Axe SAC<sup>46</sup>. Table 10-25 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

# Table 10-25 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Sea lamprey	Pollution Events	Population: population abundance
		Population: Juvenile densities
		Supporting habitat: Biological connectivity
		Supporting habitat: integrity of off-site habitats

- 10.14.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:
  - Supporting habitat: distribution of supporting habitat;
  - Supporting habitat: Extent of supporting habitat;
  - Supporting habitat: Biotope mosaic;
  - Supporting habitat: flow regime;

<sup>&</sup>lt;sup>46</sup> <u>http://publications.naturalengland.org.uk/publication/5156988124135424</u> (Accessed: 16 October 2019)



- Supporting habitat: riparian zone;
- Supporting habitat: sediment regime;
- Supporting habitat: soils, substrate and nutrient cycling;
- Supporting habitat: vegetation composition: invasive non-native species;
- Supporting habitat: water quality acidification;
- Supporting habitat: water quality nutrients;
- Supporting habitat: woody debris;
- Supporting processes: adaption and resilience;
- Supporting processes: conservation measures;
- Supporting processes: control of livestock grazing activity;
- Supporting processes: fisheries exploitation;
- Supporting processes: fisheries introduction of fish species;
- Supporting processes: screening of intakes and discharges;
- Supporting processes: vegetation structure: cover of submerged macrophytes; and
- Supporting processes: water quantity/quality.

## 10.14.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.14.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-26 below.
- 10.14.3.2. It is concluded that there will be no adverse effects on site integrity for the River Axe SAC, either from the Proposed Development alone, or in combination with other plans or projects.

## Table 10.19 - Assessment of potential adverse effects on site integrity for the River Axe SAC across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Sea lamprey	The populations of qualifying species	Pollution events	Population: Population abundance	Restore the abundance of the population to a level which is close to that expected under unimpacted conditions throughout the site (subject to natural habitat conditions and allowing for natural fluctuations), whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. Petromyzon sp. Should reflect distribution under near-natural conditions.	Unplanned oil or chemical spillage development phases. Spills have to sea lamprey and transformers durin migrations given their sensitivity to However, routine mitigation measure of waste management, pollution pri- and strict navigational protocols with occurring highly unlikely and there Site integrity. Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co- projects.
			Population: Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations.	projects.
	The structure and function of the habitats of qualifying species		Structure and function: Biological connectivity	The movement of characteristic biota should not be artificially constrained.	
			Structure and function: Supporting off-site habitat	Habitats beyond the site boundary upon which characteristic biological communities of the site depend should be Restored in a state that does not impair the full expression of the characteristic biota within the site.	



ges from vessels may occur during all the potential to directly affect both adult uring their spawning or seaward to pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5) will make the likelihood of these events refore will not result in adverse effects on

her potential plans and projects and the best practice measures which could cts, it is predicted that there will be no combination with other plans and

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Conclusion: Nother plans of	•	ect on site integrity ca	an be concluded for th	ne River Axe SAC, arising from	n either the Proposed Development



ent alone, or in combination with

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### 10.15. PLYMOUTH SOUND AND ESTUARIES SAC

### 10.15.1. **OVERVIEW**

- 10.15.1.1. Plymouth Sound and Estuaries SAC is located on the south coast of the UK and covers approximately 6386 hectares of marine and coastal habitat and species. It has a range of features including estuaries, reefs and Atlantic salt meadows (JNCC, 2019). The SAC does not overlap the Marine Cable Corridor and is 225 km distant at its closest point.
- 10.15.1.2. Allis shad which spend a large proportion of their adult life at sea are also listed as a qualifying species.

#### 10.15.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.15.2.1. A site-specific SACO is available for Plymouth Sound and Estuaries SAC<sup>47</sup>. Table 10-27 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

### Table 10-27 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Allis shad	Pollution Events	Population: recruitment and reproductive capability
		Structure and function: Biological connectivity
		Supporting habitat: food availability
		Supporting processes: water quality - contaminants

- 10.15.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:
  - Population: population size;
  - Presence and spatial distribution of the species;
  - Structure: Non-native species and pathogens;
  - 47

https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0013111&SiteName=ply mouth&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerson=&SeaAr ea=&IFCAArea=&NumMarineSeasonality=4 (Accessed: 16 October 2019)



- Supporting habitat: extent and distribution;
- Supporting habitat: sediment regime;
- Supporting processes: fisheries exploitation;
- Supporting processes: physico-chemical properties;
- Supporting processes: sediment movement and hydrodynamic regime;
- Supporting processes: water quality DO;
- Supporting processes: water quality nutrients; and
- Supporting processes: water quality turbidity;

### 10.15.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.15.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-28 below.
- 10.15.3.2. It is concluded that there will be no adverse effects on site integrity for the Plymouth Sound and Estuaries SAC, either from the Proposed Development alone, or in combination with other plans or projects.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Allis shad	The populations of qualifying species within the site	Pollution events	Population: recruitment and reproductive capability	Restore the reproductive and recruitment capability of the species.	Unplanned oil or chemical spillage development phases. Spills have the during their spawning migration give preference for surface waters.
	The structure and function of the habitats of qualifying species		Structure and function: Biological connectivity	Restore connectivity of estuarine features to surrounding rivers, freshwater, marine and coastal habitats, to ensure larval dispersal and recruitment, maintain nursery grounds for mobile species, and to allow movement of migratory species.	However, routine mitigation measure of waste management, pollution pre- and strict navigational protocols will occurring highly unlikely and therefore site integrity from the Proposed De Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co
	The structure and function of the habitats of the qualifying species		Supporting habitat: food availability	Maintain the cover/abundance of preferred food items required by the species.	projects.
	The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely		Supporting processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to [High / Good] Status (according to Annex VIII and X of the WFD), avoiding deterioration from existing levels.	

Table 10-28 - Assessment of potential adverse effects on site integrity for Plymouth Sound and Estuaries SAC across all phases of the Proposed Development both alone and in combination with other plans and projects

Conclusion: No significant adverse effect on site integrity can be concluded for the Plymouth sound and estuaries SAC, arising from either the Proposed Development alone, or in combination with other plans or projects.



es from vessels may occur during all the potential to directly affect allis shad iven their sensitivity to pollution and

ures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on evelopment alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

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### 10.16. LITTORAL CAUCHOIS ZSC

### 10.16.1. **OVERVIEW**

- 10.16.1.1. Littoral Cauchois ZSC covers approximately 63 km<sup>2</sup> of the French coast from Le Treport to Le Havre. It is designated for both marine and terrestrial habitats and species (EEA, 2019a). The ZSC does not overlap the Marine Cable Corridor and is 52.7 km distant at its closest point.
- 10.16.1.2. For migratory fish features, twaite shad, river lamprey and sea lamprey are qualifying features of this site.
- 10.16.1.3. For marine mammal features, bottlenose dolphin, harbour porpoise, grey seal and harbour seal are qualifying features of this site.
- 10.16.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): ANNEX II DIADROMOUS MIGRATORY FISH SPECIES
- 10.16.2.1. Site-specific SACO is not available for the Littoral Cauchois ZSC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC<sup>48</sup> which shares the same interest features will be used for the assessment. It should be noted that targets for the River Wye SAC will not be used for Littoral Cauchois ZSC as these are site specific. Table 10-29 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

### Table 10-29 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Twaite shad	Pollution Events	Population: adult run size Population: juvenile densities Supporting habitat: Biological connectivity Supporting processes: Integrity of off-site habitats
River lamprey	Pollution Events	Population: population abundance Population: Juvenile densities

<sup>48</sup> <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)



Feature	Impact for which LSE could not be excluded	Equivalent attribute
		Supporting habitat: Biological connectivity
		Supporting habitats: Integrity of off-site habitats
Sea lamprey	Pollution Events	Population: population abundance
		Population: Juvenile densities
		Supporting habitat: Biological connectivity
		Supporting habitats: Integrity of off-site habitats

# 10.16.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:

- Population: spawning distribution;
- Supporting habitat: distribution of supporting habitat;
- Supporting habitat: Extent of supporting habitat;
- Supporting habitat: Biotope mosaic;
- Supporting habitat: flow regime;
- Supporting habitat: riparian zone;
- Supporting habitat: sediment regime;
- Supporting habitat: soils, substrate and nutrient cycling;
- Supporting habitat: vegetation composition: invasive non-native species;
- Supporting habitat: water quality acidification;
- Supporting habitat: water quality nutrients;
- Supporting habitat: woody debris;
- Supporting processes: air quality;
- Supporting processes: adaption and resilience;
- Supporting processes: conservation measures;



- Supporting processes: control of livestock grazing activity;
- Supporting processes: fisheries exploitation;
- Supporting processes: fisheries introduction of fish species;
- Supporting processes: fisheries introduction of shad;
- Supporting habitat/processes: screening of intakes and discharges;
- Supporting processes: vegetation structure: cover of submerged macrophytes; and
- Supporting processes: water quantity/quality.

### 10.16.3. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): MARINE MAMMAL SPECIES

- 10.16.3.1. Site-specific SACO is not currently available for this site. As such, the following information was used for each species:
  - Bottlenose dolphin: Cardigan Bay SAC document<sup>49</sup>;
  - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document<sup>50</sup>;
  - Grey seal: Pembrokeshire Marine SAC document<sup>51</sup> and the SACOs page of Natural England's Designated Sites View website for the Humber SAC<sup>52</sup>; and
  - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC<sup>53</sup>.
- 10.16.3.2. Table10-30 below lists those attributes considered to be equivalent to those impacts for which an LSE could not be excluded (pollution). No attributes were listed for either the proxy or other UK sites for either bottlenose dolphin or harbour porpoise.

#### Table 10-30 - SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute	
Bottlenose dolphin	Pollution	NA	
Harbour porpoise	Pollution	NA	

<sup>49</sup> <u>https://cdn.naturalresources.wales/media/687993/eng-cardigan-bay-reg-37-report-</u>

2018.pdf?mode=pad&rnd=131929023330000000

<sup>&</sup>lt;sup>50</sup> <u>http://jncc.defra.gov.uk/pdf/SNorthSea\_ConsAdvice.pdf</u>

<sup>&</sup>lt;sup>51</sup> https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

<sup>2018.</sup>pdf?mode=pad&rnd=131929024980000000

<sup>&</sup>lt;sup>52</sup> <u>https://designatedsites.naturalengland.org.uk/</u>

<sup>53</sup> https://designatedsites.naturalengland.org.uk/



Feature	Impact for which LSE could not be excluded	Equivalent attribute	
Grey seal	Pollution	Supporting processes: water quality - contaminants	
Harbour seal	Pollution	Supporting processes: water quality - contaminants	

- 10.16.3.3. The following non-equivalent attributes listed within the SACOs were screened out from further assessment:
  - Population: population size
  - Population: recruitment and reproductive capability
  - Presence and spatial distribution of the species
  - Structure and function: biological connectivity
  - Structure: Non-native species and pathogens
  - Supporting habitat: extent and distribution
  - Supporting habitat: food availability
  - Supporting processes: physico-chemical properties
  - Supporting processes: sediment movement and hydrodynamic regime
  - Supporting processes: water quality nutrients
  - Supporting processes: water quality turbidity
- 10.16.3.4. It should be noted that proxy targets have not been used because targets are sitespecific.

### 10.16.4. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.16.4.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-31 and 10-32 below.
- 10.16.4.2. It is concluded that there will be no adverse effects on site integrity for Littoral Cauchois ZSC, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10-31 - Assessment of potential adverse effects on site integrity for Annex II fish species of the Littoral Cauchois ZSC across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Twaite shad The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillages from vessels may Spills have the potential to directly affect twaite shad their sensitivity to pollution.	
			Population: juvenile densities	N/A	However, routine mitigation measures of standard be management, pollution prevention measures (Section
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	protocols will make the likelihood of these events occ not result in adverse effects on site integrity from the
	The supporting processes on which qualifying natural habitat and habitats of qualifying species rely		Supporting processes: Integrity of off-site habitats	N/A	Given the scale and nature of other potential plans an adhere to similar best practice measures which could is predicted that there will be no adverse effect on site plans and projects.
River lamprey	The populations of qualifying speciesPollution eventsPopulation: populationN/AUnplanne Spills have	Unplanned oil or chemical spillages from vessels may Spills have the potential to directly affect both adult riv their spawning or seaward migrations given their seas			
	Population: Juvenile densities		Population: Juvenile densities	N/A	However, routine mitigation measures of standard be management, pollution prevention measures (Section
	The structure and function of the habitats		Supporting habitat: Biological	N/A	protocols will make the likelihood of these events occ not result in adverse effects on site integrity.
	of qualifying species			cies connectivity	
Sea lamprey	The populations of qualifying species	Pollution events	Population: Population abundance	N/A	Unplanned oil or chemical spillages from vessels may Spills have the potential to directly affect both adult se their spawning or seaward migrations given their sense
			Population: Juvenile densities	N/A	However, routine mitigation measures of standard be management, pollution prevention measures (Section protocols will make the likelihood of these events occ
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	not result in adverse effects on site integrity from the Given the scale and nature of other potential plans ar adhere to similar best practice measures which could

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ay occur during all development phases. d during their spawning migration given

best practice in terms of waste on 10.2.5) and strict navigational ccurring highly unlikely and therefore will e Proposed Development alone.

and projects and the requirement to Id contribute to in combination effects, it ite integrity in combination with other

ay occur during all development phases. river lamprey and transformers during nsitivity to pollution.

best practice in terms of waste on 10.2.5) and strict navigational ccurring highly unlikely and therefore will

and projects and the requirement to Id contribute to in combination effects, it ite integrity in combination with other

ay occur during all development phases. sea lamprey and transformers during nsitivity to pollution.

best practice in terms of waste on 10.2.5) and strict navigational ccurring highly unlikely and therefore will e Proposed Development alone.

and projects and the requirement to Id contribute to in combination effects, it

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			Structure and function: Supporting off-site habitat	N/A	is predicted that there will be no adverse effect on site in plans and projects.
	No significant adverse eff Ins or projects.	ect on site integrity c	an be concluded for th	ne Littoral Ca	uchois ZSC, arising from either the Proposed Develo

## Table 10-32 - Assessment of potential adverse effects on site integrity for marine mammal species in the Littoral Cauchois ZSC across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Bottlenose dolphin	Maintain or restore: <ul> <li>The extent and distribution of</li> </ul>	Pollution	NA	NA	Mitigation included in the dML requires that the best p preventing pollution events are followed during delive
Harbour porpoise	qualifying natural habitats and habitats of the qualifying	Pollution	NA	NA	section 10.2.5). In the unlikely event of pollution even outlines procedures and responsibilities for effectcive practice measures are employed for the other plans a
Grey seal	<ul> <li>species;</li> <li>The structure and function (including typical species) of qualifying natural habitats;</li> </ul>	Pollution	Supporting processes: water quality - contaminants	NA	contribute to in combination effects. Therefore, it is considered that by adhering to mitigat be no adverse effects on site integrity, either alone or projects.
Harbour seal	<ul> <li>The structure and function of the habitats of the qualifying species;</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;</li> <li>The populations of each of the qualifying species; and</li> <li>The distribution of qualifying species within the site.</li> </ul>	Pollution	Supporting processes: water quality - contaminants	NA	

Conclusion: No significant adverse effect on site integrity can be concluded for the Littoral Cauchois ZSC, arising from either the Proposed Development alone, or in combination with other plans or projects.



te integrity in combination with other

elopment alone, or in combination

st practice plans and procedures for ivery of the Proposed Development (see rents occurring, the same mitigation vely managing any events. Similar best s and projects identified which could

ation measures will ensure that there will or in combination with other plans or

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## 10.17. ESTUAIRES ET LITTORAL PICARDS (BAIES DE SOMME ET D'AUTHIE) ZSC/ BAIE DE SOMME RAMSAR

### 10.17.1. **OVERVIEW**

- 10.17.1.1. Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC covers approximately 15,646 ha of the French coast from Mers les Bains to Baie de l'Authie. It is designated for both marine and terrestrial habitats and species (EEA, 2019b). The ZSC does not overlap the Marine Cable Corridor and is 84.6 km distant at its closest point.
- 10.17.1.2. River lamprey is qualifying feature of this site for Annex II diadromous fish species.
- 10.17.1.3. For marine mammal species, bottlenose dolphin, harbour porpoise, grey seal and harbour seal are qualifying features of the Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar.

### 10.17.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): ANNEX II DIADROMOUS MIGRATORY FISH SPECIES

10.17.2.1. Site-specific SACO is not available for the Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC<sup>54</sup> which shares the same interest feature will be used for the assessment. It should be noted that targets for the River Wye SAC will not be used for Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC as these are site specific. Table 10-33 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

### Table 10-33 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
River lamprey	Pollution Events	Population: population abundance
		Population: Juvenile densities
		Supporting habitat: Biological connectivity
		Supporting habitats: Integrity of off-site habitats

# 10.17.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:

<sup>&</sup>lt;sup>54</sup> <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)



- Supporting habitat: distribution of supporting habitat;
- Supporting habitat: Extent of supporting habitat;
- Supporting habitat: Biotope mosaic;
- Supporting habitat: flow regime;
- Supporting habitat: riparian zone;
- Supporting habitat: sediment regime;
- Supporting habitat: soils, substrate and nutrient cycling;
- Supporting habitat: vegetation composition: invasive non-native species;
- Supporting habitat: water quality acidification;
- Supporting habitat: water quality nutrients;
- Supporting habitat: woody debris;
- Supporting processes: adaption and resilience;
- Supporting processes: conservation measures;
- Supporting processes: control of livestock grazing activity;
- Supporting processes: fisheries exploitation;
- Supporting processes: fisheries introduction of fish species;
- Supporting processes: screening of intakes and discharges;
- Supporting processes: vegetation structure: cover of submerged macrophytes; and
- Supporting processes: water quantity/quality.

## 10.17.3. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): MARINE MAMMAL SPECIES

- 10.17.3.1. Site-specific SACO is not currently available for this site. As such, the following information was used for each species:
  - Bottlenose dolphin: Cardigan Bay SAC document<sup>55</sup>;
  - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document<sup>56</sup>;

<sup>&</sup>lt;sup>55</sup> <u>https://cdn.naturalresources.wales/media/687993/eng-cardigan-bay-reg-37-report-</u>

<sup>2018.</sup>pdf?mode=pad&rnd=131929023330000000

<sup>&</sup>lt;sup>56</sup> <u>http://jncc.defra.gov.uk/pdf/SNorthSea</u> ConsAdvice.pdf



- Grey seal: Pembrokeshire Marine SAC document<sup>57</sup> and the SACOs page of Natural England's Designated Sites View website for the Humber SAC<sup>58</sup>; and
- Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC<sup>59</sup>.
- 10.17.3.2. Table 10-34 below lists those attributes considered to be equivalent to those impacts for which an LSE could not be excluded (i.e. pollution). No attributes were listed for either the proxy or other UK sites for either bottlenose dolphin or harbour porpoise.

Feature	Impact for which LSE could not be excluded	Equivalent Attribute
Bottlenose dolphin	Pollution	NA
Harbour porpoise	Pollution	NA
Grey seal	Pollution	Supporting processes: water quality - contaminants
Harbour seal	Pollution	Supporting processes: water quality - contaminants

### Table 10-34 - SACO attributes screened in for assessment

- 10.17.3.3. The following non-equivalent attributes listed within the SACOs were screened out from further assessment:
  - Population: population size
  - Population: recruitment and reproductive capability
  - Presence and spatial distribution of the species
  - Structure and function: biological connectivity
  - Structure: Non-native species and pathogens
  - Supporting habitat: extent and distribution
  - Supporting habitat: food availability
  - Supporting processes: physico-chemical properties

<sup>&</sup>lt;sup>57</sup> <u>https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-</u>2018.pdf?mode=pad&rnd=131929024980000000

<sup>&</sup>lt;sup>58</sup> https://designatedsites.naturalengland.org.uk/

<sup>&</sup>lt;sup>59</sup> <u>https://designatedsites.naturalengland.org.uk/</u>



- Supporting processes: sediment movement and hydrodynamic regime
- Supporting processes: water quality nutrients
- Supporting processes: water quality turbidity
- 10.17.4. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY
- 10.17.4.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-35 and Table 10-36 below.
- 10.17.4.2. It is concluded that there will be no adverse effects on site integrity for Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC, either from the Proposed Development alone, or in combination with other plans or projects

Table 10-35 - Assessment of potential adverse effects on site integrity for Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC across	s al
Development both alone and in combination with other plans and projects	

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
River lampreyThe populations of qualifying species	Pollution events	Population: population abundance	N/A	Unplanned oil or chemical spillages development phases. Spills have th river lamprey and transformers durin migrations given their sensitivity to p	
	Population: Juvenile densities	Population: Juvenile densities	N/A	However, routine mitigation measur of waste management, pollution pre and strict navigational protocols will occurring highly unlikely and therefo	
The structure and function of the habitats of qualifying species	unction of the habitats Biological	•	N/A	site integrity from the Proposed Dev Given the scale and nature of other	
		N/A	requirement to adhere to similar best contribute to in combination effects, adverse effect on site integrity in co projects.		

Conclusion: No significant adverse effect on site integrity can be concluded for the Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.

Table 10-36 - Assessment of potential adverse effects on site integrity for the Estuaires et littoral picards (baies de Somme et d'Authie) ZSC/Baie de Somme Ramsar across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Bottlenose dolphin	<ul> <li>Maintain or restore:</li> <li>The extent and distribution of qualifying natural habitats and habitats of the qualifying species;</li> <li>The structure and function (including typical species) of qualifying natural habitats;</li> <li>The structure and function of the habitats of the qualifying species;</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;</li> </ul>	Pollution	NA	NA	Mitigation included in the dML requires that the best p preventing pollution events are followed during deliver
Harbour porpoise		Pollution	NA	NA	section 10.2.5). In the unlikely event of pollution event outlines procedures and responsibilities for effectively Similar best practice measures are employed for the
Grey seal		Pollution	Supporting processes: water quality - contaminants	NA	which could contribute to in combination effects. The adhering to mitigation measures will ensure that there integrity, either alone or in combination with other plan
Harbour sea		Pollution	Supporting processes: water quality - contaminants	NA	



### all phases of the Proposed

es from vessels may occur during all the potential to directly affect both adult ring their spawning or seaward pollution.

ures of standard best practice in terms revention measures (Section 10.2.5) ill make the likelihood of these events fore will not result in adverse effects on evelopment alone.

er potential plans and projects and the est practice measures which could s, it is predicted that there will be no combination with other plans and

practice plans and procedures for ery of the Proposed Development (see ents occurring, the same mitigation ly managing any events.

other plans and projects identified erefore, it is considered that by re will be no adverse effects on site ans and projects

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	The populations of each of the qualifying species; and				
	The distribution of qualifying species within the site.				

Conclusion: No significant adverse effect on site integrity can be concluded for the Estuaires et Littoral Picards (Baies de Somme et d'Authie) ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.



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### 10.18. BAIE DE CANCHE ET COULOIR DES TROIS ESTUARIES ZSC

### 10.18.1. **OVERVIEW**

- 10.18.1.1. Estuaires et Baie de Canche et Couloir des trois Estuaries ZSC covers approximately 33,306 ha of the French coast from Ault to Camiers. It is designated for both marine and esturine habitat and species (EEA, 2019c). The ZSC does not overlap the Marine Cable Corridor and is 86.5 km distant at its closest point.
- 10.18.1.2. Salmon, allis shad, river lamprey, and sea lamprey are Annex II fish qualifying features of this site.
- 10.18.1.3. Harbour porpoise, grey seal and harbour seal are marine mammal qualifying features of the site

### 10.18.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): ANNEX II DIADROMOUS MIGRATORY FISH SPECIES

10.18.2.1. Site-specific SACO is not available for the Baie de Canche et Couloir des trois Estuaries ZSC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC<sup>60</sup> which shares the same interest features will be used for the assessment. It should be noted that targets for the River Wye SAC will not be used for Baie de Canche et Couloir des trois Estuaries ZSC as these are site specific. Table 10-37 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

### Table 10-37 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Salmon	Pollution Events	Population: adult run size Population: juvenile densities Supporting habitat: biological connectivity Supporting processes: integrity of off-site habitats
Allis shad	Pollution Events	Population: adult run size Population: juvenile densities Supporting habitat: Biological connectivity Supporting processes: Integrity of off-site habitats

<sup>60</sup> <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)



Feature	Impact for which LSE could not be excluded	Equivalent attribute
River lamprey	Pollution Events	Population: population abundance Population: Juvenile densities Supporting habitat: Biological connectivity Supporting habitats: Integrity of off-site habitats
Sea lamprey	Pollution Events	Population: population abundance Population: Juvenile densities Supporting habitat: Biological connectivity Supporting habitats: Integrity of off-site habitats

# 10.18.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:

- Population: spawning distribution;
- Supporting habitat: distribution of supporting habitat;
- Supporting habitat: Extent of supporting habitat;
- Supporting habitat: Biotope mosaic;
- Supporting habitat: flow regime;
- Supporting habitat: riparian zone;
- Supporting habitat: sediment regime;
- Supporting habitat: soils, substrate and nutrient cycling;
- Supporting habitat: vegetation composition: invasive non-native species;
- Supporting habitat: water quality acidification;
- Supporting habitat: water quality nutrients;
- Supporting habitat: woody debris;
- Supporting processes: adaption and resilience;
- Supporting processes: conservation measures;
- Supporting processes: control of livestock grazing activity;



- Supporting processes: fisheries exploitation;
- Supporting processes: fisheries introduction of fish species;
- Supporting processes: fisheries introduction of salmon;
- Supporting processes: screening of intakes and discharges;
- Supporting processes: air quality;
- Supporting processes: vegetation structure: cover of submerged macrophytes; and
- Supporting processes: water quantity/quality.

## 10.18.3. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): MARINE MAMMAL SPECIES

- 10.18.3.1. Site-specific SACO is not currently available for this site. As such, the following information was used for each species:
  - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document<sup>61</sup>;
  - Grey seal: Pembrokeshire Marine SAC document<sup>62</sup> and the SACOs page of Natural England's Designated Sites View website for the Humber SAC<sup>63</sup>; and
  - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC<sup>64</sup>.
- 10.18.3.2. Table 10-38 below lists those attributes considered to be equivalent to those impacts for which an LSE could not be excluded (pollution). No attributes were listed for either the proxy or other UK sites for harbour porpoise.

### Table 10-38 - SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Harbour porpoise	Pollution	NA
Grey seal	Pollution	Supporting processes: water quality - contaminants

<sup>&</sup>lt;sup>61</sup> <u>http://jncc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf</u>

<sup>62</sup> https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

<sup>2018.</sup>pdf?mode=pad&rnd=131929024980000000

<sup>&</sup>lt;sup>63</sup> https://designatedsites.naturalengland.org.uk/

<sup>&</sup>lt;sup>64</sup> https://designatedsites.naturalengland.org.uk/



Feature	Impact for which LSE could not be excluded	Equivalent attribute
Harbour seal	Pollution	Supporting processes: water quality - contaminants

## 10.18.3.3. The following non-related attributes listed within the SACOs were screened out from further assessment:

- Population: population size
- Population: recruitment and reproductive capability
- Presence and spatial distribution of the species
- Structure and function: biological connectivity
- Structure: Non-native species and pathogens
- Supporting habitat: extent and distribution
- Supporting habitat: food availability
- Supporting processes: physico-chemical properties
- Supporting processes: sediment movement and hydrodynamic regime
- Supporting processes: water quality nutrients
- Supporting processes: water quality turbidity

### 10.18.4. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.18.4.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-39 and Table 10-40 below.
- 10.18.4.2. It is concluded that there will be no adverse effects on site integrity for Baie de Canche et Couloir des trois Estuaries ZSC, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10-39 - Assessment of potential adverse effects on site integrity for Baie de Canche et Couloir des trois Estuaries ZSC across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effects	Attribute	Target	Assessment
	The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillages development phases. Spills have th salmon and smolts during their spa their sensitivity to pollution and pref
			Population: juvenile densities	N/A	However, routine mitigation measu of waste management, pollution pre and strict navigational protocols will occurring highly unlikely and theref
	The structure and function of the habitats		Supporting habitat:	N/A	site integrity from the Proposed De
	of qualifying species		biological connectivity		Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects
	The supporting processes on which qualifying natural habitat and habitats of qualifying species rely		Supporting processes: integrity of off-site habitats	N/A	adverse effect on site integrity in co projects.
Allis shad	The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillage development phases. Spills have
			Population: juvenile densities	N/A	<ul> <li>during their spawning migrations gi</li> <li>However, routine mitigation measure</li> <li>of waste management, pollution pressure</li> </ul>
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	and strict navigational protocols wil occurring highly unlikely and therefore site integrity from the Proposed De
	The supporting processes on which qualifying natural habitat and habitats of qualifying species rely		Supporting processes: Integrity of off-site habitats	N/A	Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects, adverse effect on site integrity in co projects.
River lamprey	The populations of qualifying species	Pollution events	Population: population abundance	N/A	Unplanned oil or chemical spillages development phases. Spills have the



es from vessels may occur during all the potential to directly affect both adult pawning or seaward migrations given eference for surface waters.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on evelopment alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

es from vessels may occur during all the potential to directly affect allis shad given their sensitivity to pollution. sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on evelopment alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

es from vessels may occur during all the potential to directly affect both adult

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Feature	Conservation Objectives	Effects	Attribute	Target	Assessment
		_			river lamprey and transformers duri migrations given their sensitivity to
	Population: Juvenile densities		Population: Juvenile densities	N/A	However, routine mitigation measure of waste management, pollution pre and strict navigational protocols will
	The structure and function of the habitats		Supporting habitat: Biological	N/A	occurring highly unlikely and therefore site integrity from the Proposed De
	of qualifying species		connectivity		Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co projects.
Sea lamprey	The populations of qualifying species	Pollution events	Population: Population abundance	N/A	Unplanned oil or chemical spillages development phases. Spills have the sea lamprey and transformers during their constitution to pollution
			Population: Juvenile densities	N/A	their sensitivity to pollution. However, routine mitigation measur of waste management, pollution pre
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	and strict navigational protocols will occurring highly unlikely and therefore site integrity from the Proposed De-
			Structure and function: Supporting off-site habitat	N/A	Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co projects.

Conclusion: No significant adverse effect on site integrity can be concluded for the Baie de Canche et couloir des trois estuaires ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.



uring their spawning or seaward o pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on Development alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

es from vessels may occur during all the potential to directly affect both adult ring their spawning migrations given

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on Development alone..

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

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Table 10-40 - Assessment of potential adverse effects on site integrity for the Baie de Canche et couloir des trois estuaires ZSC across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Harbour porpoise	Maintain or restore: The extent and distribution of qualifying natural habitats and habitats of the qualifying species; The structure and function (including typical species) of qualifying natural	Pollution	NA	NA	Mitigation included in the dML requires that the best proventing pollution events are followed during delivery
Grey seal		Pollution	Supporting processes: water quality - contaminants	NA	section 10.2.5). In the unlikely event of pollution events outlines procedures and responsibilities for effectively Similar best practice measures are employed for the o could contribute to in combination effects. Therefore, in
Harbour seal	<ul> <li>typical species) of qualifying natural habitats;</li> <li>The structure and function of the habitats of the qualifying species;</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;</li> <li>The populations of each of the qualifying species; and</li> <li>The distribution of qualifying species within the site.</li> </ul>	Pollution	Supporting processes: water quality - contaminants	NA	mitigation measures will ensure that there will be no ad alone or in combination.

Conclusion: No significant adverse effect on site integrity can be concluded for the Baie de Canche et couloir des trois estuaires ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.



practice plans and procedures for ery of the Proposed Development (see nts occurring, the same mitigation y managing any events.

other plans and projects identified which it is considered that adhering to adverse effects on site integrity, either

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### 10.19. BAIE DE SEINE ORIENTALE ZSC

#### 10.19.1. **OVERVIEW**

- 10.19.1.1. Estuaires et Baie de Seine Orientale ZSC covers approximately 44,402 ha of the French marine area off the soast of Ouistreham. It is designated for both marine habitats and species (EEA, 2019d). The ZSC does not overlap the Marine Cable Corridor and is 90.9 km distant at its closest point.
- 10.19.1.2. Twaite shad, salmon, allis shad, river lamprey, and sea lamprey are Annex II fish qualifying features of this site.
- 10.19.1.3. Bottlenose dolphin, harbour porpoise, grey seal and harbour seal are marine mammal qualifying features of the site

### 10.19.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): ANNEX II MIGRATORY DIADROMOUS FISH SPECIES

10.19.2.1. Site-specific SACO is not available for the Baie de Seine Orientale ZSC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC<sup>65</sup> which shares the same interest features will be used for the assessment. It should be noted that targets for the River Wye SAC will not be used for Baie de Seine Orientale ZSC as these are site specific. Table 10-41 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

### Table 10-41 - Conservation and Supplementary Advice attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Twaite shad	Pollution Events	Population: adult run size Population: juvenile densities Supporting habitat: Biological connectivity Supporting processes: Integrity of off-site habitats
Salmon	Pollution Events	Population: adult run size Population: juvenile densities Supporting habitat: biological connectivity

<sup>65</sup> <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)



Feature	Impact for which LSE could not be excluded	Equivalent attribute
		Supporting processes: integrity of off-site habitats
Allis shad	Pollution Events	Population: adult run size Population: juvenile densities Supporting habitat: Biological connectivity Supporting processes: Integrity of off-site habitats
River lamprey	Pollution Events	Population: population abundance Population: Juvenile densities Supporting habitat: Biological connectivity Supporting habitats: Integrity of off-site habitats
Sea lamprey	Pollution Events	Population: population abundance Population: Juvenile densities Supporting habitat: Biological connectivity Supporting habitats: Integrity of off-site habitats

- 10.19.2.2. Non-equivalent attributes listed within the Conservation Objectives and Supplementary Advice document which are screened out from further assessment included:
  - Population: spawning distribution;
  - Supporting habitat: distribution of supporting habitat;
  - Supporting habitat: Extent of supporting habitat;



- Supporting habitat: Biotope mosaic;
- Supporting habitat: flow regime;
- Supporting habitat: riparian zone;
- Supporting habitat: sediment regime;
- Supporting habitat: soils, substrate and nutrient cycling;
- Supporting habitat: vegetation composition: invasive non-native species;
- Supporting habitat: water quality acidification;
- Supporting habitat: water quality nutrients;
- Supporting habitat: woody debris;
- Supporting processes: adaption and resilience;
- Supporting processes: conservation measures;
- Supporting processes: control of livestock grazing activity;
- Supporting processes: fisheries exploitation;
- Supporting processes: fisheries introduction of fish species;
- Supporting processes: fisheries introduction of salmon;
- Supporting processes: screening of intakes and discharges;
- Supporting processes: air quality;
- Supporting processes: vegetation structure: cover of submerged macrophytes; and
- Supporting processes: water quantity/quality.

## 10.19.3. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): MARINE MAMMAL SPECIES

- 10.19.3.1. Site-specific SACO is not currently available for this site. As such, the following information was used for each species:
  - Bottlenose dolphin: Cardigan Bay SAC document<sup>66</sup>;
  - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document<sup>67</sup>;

<sup>&</sup>lt;sup>66</sup> <u>https://cdn.naturalresources.wales/media/687993/eng-cardigan-bay-reg-37-report-</u>2018.pdf?mode=pad&rnd=131929023330000000

<sup>&</sup>lt;sup>67</sup> http://jncc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf



- Grey seal: Pembrokeshire Marine SAC document<sup>68</sup> and the SACOs page of Natural England's Designated Sites View website for the Humber SAC<sup>69</sup>; and
- Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC<sup>70</sup>.
- 10.19.3.2. Table 10-42 below lists those attributes considered to be equivalent to those impacts for which an LSE could not be excluded (pollution). No attributes were listed for either the proxy or other UK sites for either bottlenose dolphin or harbour porpoise.

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Bottlenose dolphin	Pollution	NA
Harbour porpoise	Pollution	NA
Grey seal	Pollution	Supporting processes: water quality - contaminants
Harbour seal	Pollution	Supporting processes: water quality - contaminants

### Table 10-42 - SACO attributes screened in for assessment

- 10.19.3.3. The following non-equivalent attributes listed within the SACOs were screened out from further assessment:
  - Population: population size
  - Population: recruitment and reproductive capability
  - Presence and spatial distribution of the species
  - Structure and function: biological connectivity
  - Structure: Non-native species and pathogens
  - Supporting habitat: extent and distribution
  - Supporting habitat: food availability
  - Supporting processes: physico-chemical properties
  - Supporting processes: sediment movement and hydrodynamic regime

<sup>&</sup>lt;sup>68</sup> <u>https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-</u> 2018.pdf?mode=pad&rnd=131929024980000000

<sup>&</sup>lt;sup>69</sup> <u>https://designatedsites.naturalengland.org.uk/</u>

<sup>&</sup>lt;sup>70</sup> <u>https://designatedsites.naturalengland.org.uk/</u>



- Supporting processes: water quality nutrients
- Supporting processes: water quality turbidity
- 10.19.4. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY
- 10.19.4.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-43 and Table 10-44 below.
- 10.19.4.2. It is concluded that there will be no adverse effects on site integrity for Baie de Seine Orientale ZSC, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10-43 - Assessment of potential adverse effects on site integrity for Annex II fish species of Baie de Seine Orientale ZSC across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Twaite shad	The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillage development phases. Spills have the shad during their spawning migrati
			Population: juvenile densities	N/A	However, routine mitigation measure of waste management, pollution pr
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	and strict navigational protocols wi occurring highly unlikely and theref site integrity from the Proposed De
	The supporting processes on which qualifying natural habitat and habitats of qualifying species rely		Supporting processes: Integrity of off-site habitats	N/A	Given the scale and nature of othe requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co projects.
Salmon	The populations of qualifying species		Population: adult run size	N/A	Unplanned oil or chemical spillages development phases. Spills have the
			Population: juvenile densities	N/A	<ul> <li>salmon and smolts during their spattcheir sensitivity to pollution and pre</li> <li>However, routine mitigation measurements</li> </ul>
	The structure and function of the habitats of qualifying species		Supporting habitat: biological connectivity	N/A	of waste management, pollution pro and strict navigational protocols wi occurring highly unlikely and theref
	The supporting processes on which qualifying natural habitat and habitats of qualifying species rely		Supporting processes: integrity of off-site habitats	N/A	site integrity from the Proposed De Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co projects.
Allis shad	The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillages development phases. Spills have the during their spawning migrations g
			Population: juvenile densities	N/A	However, routine mitigation measured of waste management, pollution pre-



es from vessels may occur during all the potential to directly affect twaite tions given their sensitivity to pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on evelopment alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

es from vessels may occur during all the potential to directly affect both adult pawning or seaward migrations given eference for surface waters.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on evelopment alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

es from vessels may occur during all the potential to directly affect allis shad given their sensitivity to pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5)

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	and strict navigational protocols wil occurring highly unlikely and therefore site integrity from the Proposed De
	The supporting processes on which qualifying natural habitat and habitats of qualifying species rely		Supporting processes: Integrity of off-site habitats	N/A	Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co projects.
River lamprey	The populations of qualifying species	Pollution events	Population: population abundance	N/A	Unplanned oil or chemical spillages development phases. Spills have the river lamprey and transformers duri migrations given their sensitivity to
	Population: Juvenile densities		Population: Juvenile densities	N/A	However, routine mitigation measure of waste management, pollution pre-
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	and strict navigational protocols wil occurring highly unlikely and therefore site integrity from the Proposed De
					Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects adverse effect on site integrity in co projects.
Sea lamprey	The populations of qualifying species	Pollution events	Population: Population abundance	N/A	Unplanned oil or chemical spillages development phases. Spills have the
			Population: Juvenile densities	N/A	sea lamprey and transformers durir migrations given their sensitivity to
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	However, routine mitigation measure of waste management, pollution pro and strict navigational protocols will
			Structure and function: Supporting off-site habitat	N/A	occurring highly unlikely and therefore site integrity from the Proposed De Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects



vill make the likelihood of these events efore will not result in adverse effects on evelopment alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

es from vessels may occur during all the potential to directly affect both adult uring their spawning or seaward o pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on pevelopment alone.

er potential plans and projects and the best practice measures which could ts, it is predicted that there will be no combination with other plans and

es from vessels may occur during all the potential to directly affect both adult ring their spawning or seaward o pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill make the likelihood of these events efore will not result in adverse effects on Development alone.

er potential plans and projects and the pest practice measures which could ts, it is predicted that there will be no

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					adverse effect on site integrity in comprojects.
Conclusion	Ne significant advaras of	fact on olto intervity o	on he concluded for th	a Daia da Caina ariantela 700	arising from sither the Bronesed I

Conclusion: No significant adverse effect on site integrity can be concluded for the Baie de Seine orientale ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.

Table 10-44 - Assessment of potential adverse effects on site integrity for marine mammal features of the Baie de Seine orientale ZSC across all p	٥h
both alone and in combination with other plans or projects	

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Bottlenose dolphin	Maintain or restore: The extent and distribution of qualifying natural habitats and habitats of the qualifying species; The structure and function (including typical species) of qualifying natural habitats; The structure and function of the	Pollution	NA	NA	Mitigation included in the dML requires that the best p preventing pollution events are followed during deliver
Harbour porpoise		qualifying natural habitats and habitats of the qualifying species; Pollution NA NA	NA	section 10.2.5). In the unlikely event of pollution event outlines procedures and responsibilities for effectively Similar best practice measures are employed for the o	
Grey seal		Pollution	Supporting processes: water quality - contaminants	NA	which could contribute to in combination effects. There mitigation measures will ensure that there will be no a alone or in combination with other plans or projects.
Harbour seal	<ul> <li>habitats of the qualifying species;</li> <li>The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;</li> <li>The populations of each of the qualifying species; and</li> <li>The distribution of qualifying species within the site.</li> </ul>	Pollution	Supporting processes: water quality - contaminants	NA	

Conclusion: No significant adverse effect on site integrity can be concluded for the Baie de Seine orientale ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.



combination with other plans and

### phases of the Proposed Development

e practice plans and procedures for very of the Proposed Development (see ents occurring, the same mitigation ely managing any events.

e other plans and projects identified refore, it is considered that adhering to adverse effects on site integrity, either

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### 10.20. RIDENS ET DUNES HYDRAULIQUES DU DÉTROIT DU PAS-DE-CALAIS SAC

#### 10.20.1. **OVERVIEW**

- 10.20.1.1. Harbour porpoise, grey seal and harbour seal are qualifying features of the Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC which is approximately 59 km from the Proposed Development at its closest point.
- 10.20.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)
- 10.20.2.1. Site-specific SACO is not currently available for this site. As such, the following information was used for each species:
  - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document<sup>71</sup>;
  - Grey seal: Pembrokeshire Marine SAC document<sup>72</sup> and the SACOs page of Natural England's Designated Sites View website for the Humber SAC<sup>73</sup>; and
  - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC<sup>74</sup>.
- 10.20.2.2. Table 10-45 below lists those attributes considered to be equivalent to those impacts for which an LSE could not be excluded (pollution). No attributes were listed for either the proxy or other UK sites for harbour porpoise.

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Harbour porpoise	Pollution	NA
Grey seal	Pollution	Supporting processes: water quality - contaminants
Harbour seal	Pollution	Supporting processes: water quality - contaminants

### Table 10-45 - SACO attributes screened in for assessment

<sup>71</sup> http://jncc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf

<sup>72</sup> https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

<sup>2018.</sup>pdf?mode=pad&rnd=131929024980000000

<sup>73</sup> https://designatedsites.naturalengland.org.uk/

<sup>&</sup>lt;sup>74</sup> https://designatedsites.naturalengland.org.uk/



## 10.20.2.3. The following non-equivalent attributes listed within the SACOs were screened out from further assessment:

- Population: population size
- · Population: recruitment and reproductive capability
- · Presence and spatial distribution of the species
- Structure and function: biological connectivity
- Structure: Non-native species and pathogens
- Supporting habitat: extent and distribution
- Supporting habitat: food availability
- Supporting processes: physico-chemical properties
- Supporting processes: sediment movement and hydrodynamic regime
- Supporting processes: water quality nutrients
- Supporting processes: water quality turbidity

### 10.20.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.20.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-46 below.
- 10.20.3.2. It should be noted that proxy targets have not been used because targets are sitespecific.
- 10.20.3.3. It is concluded that there will be no adverse effects on site integrity for the Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC from either the Proposed Development alone or the Proposed Development in combination with other plans or projects.

Table 10-46 - Assessment of potential adverse effects on site integrity for the Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	<b>Conservation Objectives</b>	Effect	Attribute	Target	Assessment				
Harbour	Maintain or restore:	Pollution	NA	NA	Mitigation included in the dML requires that the best pre-				
porpoise	The extent and distribution of qualifying				preventing pollution events are followed during delivery section 10.2.5). In the unlikely event of pollution events				
Grey seal	natural habitats and habitats of the qualifying species;	Pollution	Supporting processes: water quality -	NA	outlines procedures and responsibilities for effectively r				
	The structure and function (including typical species) of qualifying natural		contaminants		Similar best practice measures are employed for the could contribute to in combination effects. Therefore,				
Harbour		Pollution	Supporting processes:	NA	mitigation measures will ensure that there will be no ac alone or in combination with other plans or projects.				
seal	The structure and function of the habitats of the qualifying species;					· · · ·	water quality - contaminants		
	The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;								
	The populations of each of the qualifying species; and								
	The distribution of qualifying species within the site.								

Conclusion: No significant adverse effect on site integrity can be concluded for the Ridens et dunes hydrauliques du détroit du Pas-de-Calais ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.



practice plans and procedures for ery of the Proposed Development (see nts occurring, the same mitigation managing any events.

other plans and projects identified which it is considered that adhering to adverse effects on site integrity, either

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### 10.21. ESTUAIRE DE LA SEINE SAC

### 10.21.1. **OVERVIEW**

10.21.1.1. Harbour porpoise, grey seal and harbour seal are qualifying features of the Estuaire de la Seine SAC which is approximately 90 km from the Proposed Development at its closest point.

#### 10.21.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

- 10.21.2.1. Site-specific SACO is not currently available for this site. As such, the following information was used for each species:
  - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document<sup>75</sup>;
  - Grey seal: Pembrokeshire Marine SAC document<sup>76</sup> and the SACOs page of Natural England's Designated Sites View website for the Humber SAC<sup>77</sup>; and
  - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC<sup>78</sup>.
- 10.21.2.2. Table 10-47 below lists those attributes considered to be equivalent to those impacts for which an LSE could not be excluded (pollution). No attributes were listed for either the proxy or other UK sites for harbour porpoise.

#### Table 10-47 - SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Harbour porpoise	Pollution	NA
Grey seal	Pollution	Supporting processes: water quality - contaminants
Harbour seal	Pollution	Supporting processes: water quality - contaminants

- 10.21.2.3. The following non-equivalent attributes listed within the SACOs were screened out from further assessment:
  - Population: population size

<sup>75</sup> http://jncc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf

<sup>&</sup>lt;sup>76</sup> https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

<sup>2018.</sup>pdf?mode=pad&rnd=131929024980000000

<sup>&</sup>lt;sup>77</sup> https://designatedsites.naturalengland.org.uk/

<sup>78</sup> https://designatedsites.naturalengland.org.uk/



- Population: recruitment and reproductive capability
- Presence and spatial distribution of the species
- Structure and function: biological connectivity
- Structure: Non-native species and pathogens
- Supporting habitat: extent and distribution
- Supporting habitat: food availability
- Supporting processes: physico-chemical properties
- Supporting processes: sediment movement and hydrodynamic regime
- Supporting processes: water quality nutrients
- Supporting processes: water quality turbidity

#### 10.21.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.21.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-48 below.
- 10.21.3.2. It should be noted that proxy targets have not been used because targets are sitespecific.
- 10.21.3.3. It is concluded that there will be no adverse effects on site integrity for the Estuaire de la Seine SAC from either the Proposed Development alone or the Proposed Development in combination with other plans or projects.

# Table 10-48 - Assessment of potential adverse effects on site integrity for the Estuaire de la Seine ZSC across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Harbour porpoise	Maintain or restore: The extent and distribution of qualifying natural habitats and habitats of the qualifying species; The structure and function (including typical species) of qualifying natural habitats; The structure and function of the habitats of the qualifying species; The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; The populations of each of the qualifying species; and The distribution of qualifying species within the site.	Pollution	NA	NA	Mitigation included in the dML requires that the best p preventing pollution events are followed during delive 10.2.5). In the unlikely event of pollution events occur procedures and responsibilities for effectively managi Similar best practice measures are employed for the could contribute to in combination effects. Therefore, mitigation measures will ensure that there will be no a alone or in combination with other plans or projects.
Grey seal		Pollution	Supporting processes: water quality - contaminants	NA	
Harbour seal		Pollution	Supporting processes: water quality - contaminants	NA	

Conclusion: No significant adverse effect on site integrity can be concluded for the Estuaire de la Seine ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.



practice plans and procedures for ery of the Proposed Project (see section irring, the same mitigation outlines jing any events.

other plans and projects identified which , it is considered that adhering to adverse effects on site integrity, either

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### 10.22. RÉCIFS GRIS-NEZ BLANC-NEZ SAC

#### 10.22.1. **OVERVIEW**

10.22.1.1. Harbour porpoise, grey seal and harbour seal are qualifying features of the Récifs Gris-Nez Blanc-Nez SAC which is approximately 104 km from the Proposed Development at its closest point.

#### 10.22.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

- 10.22.2.1. Site-specific SACO is not currently available for this site. As such, the following information was used for each species:
  - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document<sup>79</sup>;
  - Grey seal: Pembrokeshire Marine SAC document<sup>80</sup> and the SACOs page of Natural England's Designated Sites View website for the Humber SAC<sup>81</sup>; and
  - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC<sup>82</sup>.
- 10.22.2.2. Table 10-49 lists those attributes considered to be equivalent to those impacts for which an LSE could not be excluded (i.e. pollution). No attributes were listed for either the proxy or other UK sites for harbour porpoise.

#### Table 10-49 - SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Harbour porpoise	Pollution	NA
Grey seal	Pollution	Supporting processes: water quality - contaminants
Harbour seal	Pollution	Supporting processes: water quality - contaminants

10.22.2.3. The following non-equivalent attributes listed within the SACOs were screened out from further assessment:

<sup>&</sup>lt;sup>79</sup> <u>http://jncc.defra.gov.uk/pdf/SNorthSea\_ConsAdvice.pdf</u>

<sup>&</sup>lt;sup>80</sup> https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

<sup>2018.</sup>pdf?mode=pad&rnd=13192902498000000

<sup>&</sup>lt;sup>81</sup> https://designatedsites.naturalengland.org.uk/

<sup>82</sup> https://designatedsites.naturalengland.org.uk/



- Population: population size
- Population: recruitment and reproductive capability
- Presence and spatial distribution of the species
- Structure and function: biological connectivity
- Structure: Non-native species and pathogens
- Supporting habitat: extent and distribution
- Supporting habitat: food availability
- Supporting processes: physico-chemical properties
- Supporting processes: sediment movement and hydrodynamic regime
- Supporting processes: water quality nutrients
- Supporting processes: water quality turbidity

### 10.22.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.22.3.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10-50 below.
- 10.22.3.2. It should be noted that proxy targets have not been used because targets are sitespecific.
- 10.22.3.3. It is concluded that there will be no adverse effects on site integrity for the Récifs Gris-Nez Blanc-Nez SAC from either the Proposed Development alone or the Proposed Development in combination with other plans or projects.

# Table 10-50 - Assessment of potential adverse effects on site integrity for the Récifs Gris-Nez Blanc-Nez ZSC across all phases of the Proposed Development both alone and in combination with other plans or projects

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Harbour	Maintain or restore:	Pollution	NA	NA	Mitigation included in the dML requires that the best pr
porpoise	The extent and distribution of qualifying natural habitats and habitats of the qualifying species; The structure and function (including				preventing pollution events are followed during delivery section 10.2.5). In the unlikely event of pollution events outlines procedures and responsibilities for effectively r Similar best practice measures are employed for the of could contribute to in combination effects. Therefore, it mitigation measures will ensure that there will be no ac alone or in combination with other plans and projects.
Grey seal		Pollution	Supporting processes: water quality - contaminants	NA	
Harbour	<ul> <li>typical species) of qualifying natural habitats;</li> <li>The structure and function of the habitats of the qualifying species;</li> </ul>	Pollution	Supporting processes: water quality - contaminants	NA	
seal					
	The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;				
	The populations of each of the qualifying species; and				
	The distribution of qualifying species within the site.				

Conclusion: No significant adverse effect on site integrity can be concluded for the Récifs Gris-Nez Blanc-Nez ZSC arising from either the Proposed Development alone, or in combination with other plans or projects.



practice plans and procedures for ery of the Proposed Development (see nts occurring, the same mitigation y managing any events.

other plans and projects identified which it is considered that adhering to adverse effects on site integrity, either

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