

AQUIND Limited

AQUIND INTERCONNECTOR

Habitats Regulations Assessment Report - Tracked Changes

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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- Appendix 2 Pre-Screening for Marine Mammals
- Appendix 3 In combination Projects Tables
- Appendix 4 Marine Consultation Responses
- Appendix 5 Ramsar Screening and Integrity Matrices



ABBREVIATIONS

Abbreviation	Term in full
AA	Appropriate Assessment
AC	Alternating Current
BAP	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	Habitats 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
ΡΑ	Planning Act
РАН	Pesticides and Polycyclic Hydrocarbons
PCC	Portsmouth City Council
PCI	Project of Common Interest

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Abbreviation	Term in full
PINS	Planning Inspectorate
PLGR	pre-lay grapnel run
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
SWBGS	Solent Waders and Brent Goose Strategy

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Abbreviation	Term in full
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

This Habitats Regulations Assessment Report 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. Surveys for onshore and intertidal breeding and wintering birds were undertaken within a 500 m buffer from the Proposed Developments's Order Limits.

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.

Twenty designated sites (SAC, SPA, Ramsar) 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 effects, the potential for an adverse effect on the integrity of eleven UK designated sites (SACs and SPA/Ramsars) and eight French designated sites (SPAs, SACs) 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 has been 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 were consulted and commented on a draft version of this HRA Report. Those comments have been taken into account in producing 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 Applicant is a UK-registered company with the sole business of developing and operating AQUIND Interconnector. 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 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.





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

1.2.1.2.

The Proposed Development includes:

- Works at the existing Lovedean Substation in Hampshire to facilitate the connection of the Proposed Development to the National Electricity Transmission System ('NETS');
- Underground high voltage alternating current ('HVAC') Cables accompanied by a smaller diameter FOC, connecting Lovedean Substation to the proposed Converter Station;
 - A newly constructed Converter Station Area comprising
 - the Converter Station and associated equipment;
 - a Works Compound and Laydown Area;
 - o an Access Road and associated haul roads;
 - surface water drainage and associated attenuation ponds;
 - landscape and ecology measures;
 - utilities such as potable water, electricity and telecoms; and



- the compound comprising the Telecommunications Building(s) and associated equipment.;
- Two pairs of underground Onshore HVDC Cables, each pair accompanied by a smaller diameter Fibre-Optic Cable ('FOC'), to run from the Converter Station to the Landfall site in Eastney (near Portsmouth), approximately 20 km in length;
- Infrastructure to join the Onshore and Marine HVDC Cables together at the Landfall, and two Optical Regeneration Stations ('ORS') (one for each circuit) housed in separate buildings; and
- Two pairs of Marine HVDC Cables, each pair accompanied by a smaller diameter FOC, to run from the Landfall site in Eastney to the boundary of the UK Exclusive Economic Zone ('EEZ').
- 1.2.1.3. Chapter 3 (Description of the Proposed Development) of the Environmental Statement ('ES') (APP-118)) 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 HABITATS 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, SPAs 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 proposed 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. HABITATS REGULATIONS ASSESSMENT

- 2.2.1.1. The Habitats 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 designated¹.
- 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 designation².

² English Nature, 1997 – Habitats Regulations Guidance Note.

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



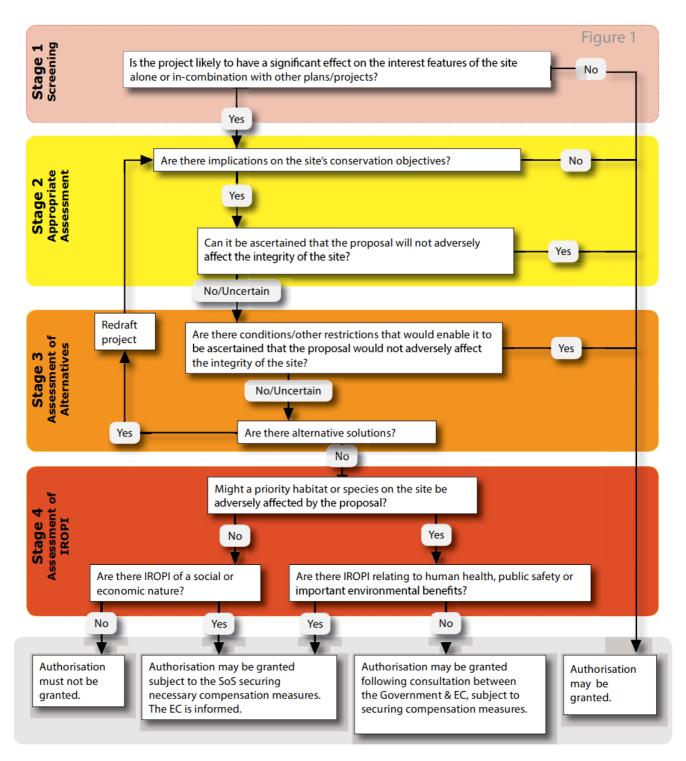


Plate 2.1 - Four Stage HRA Process (PINS, 2017)



2.3. APPROACH TO SCREENING

- 2.3.1.1. Screening is a relatively coarse filter to identify those sites and features for which LSE 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 likely 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 05/2018³, disregarding all measures that could be construed as being introduced 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.
- 2.3.1.3. With respect to in combination effects, the plans and projects that have been considered have been agreed through discussion with local authorities, the Marine Management Organisation and Statutory Nature Conservation Bodies (SNCBs) who have identified specific projects for inclusion in the in combination assessment. The HRA Report includes, 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 integrity.

³ 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. 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.
- 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 the 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 (APP-502).
- 2.4.1.8. The Project will cross between two Member States which are the UK and France. It was included on the third Project of Common Interest 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) (APP-504).
- 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).

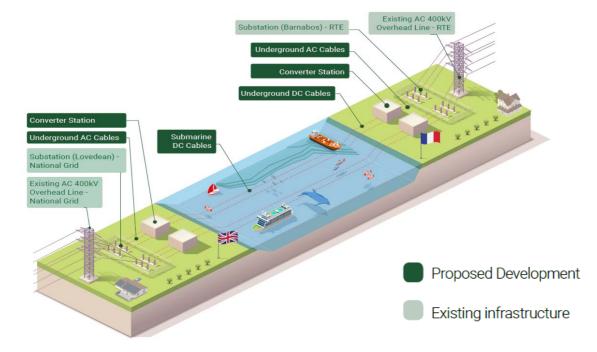


Plate 3.1 - The main elements of AQUIND Interconnector

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 will be approximately 238 km in length and comprise the following Marine and Onshore Components in France and UK (see Plate 3.1):
 - Marine HVDC Cables;
 - Onshore HVDC Cables;
 - Converter Stations;
 - HVAC Cables;
 - FOC and FOC Infrastructure, and
 - other associated infrastructure.
- 3.1.1.4. 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 connection to the French elements of the Project has 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.
- 3.2.1.2. The Proposed Development is broadly comprised of the Marine Components and the Onshore Components.

3.2.2. MARINE 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 44 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 reflect 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;
- A newly constructed Converter Station Area comprising:
 - the Converter Station and associated equipment;
 - a Works Compound and Laydown Area;
 - o an Access Road and associated haul roads;
 - surface water drainage and associated attenuation ponds;
 - landscape and ecology measures;
 - utilities such as potable water, electricity and telecoms; and
 - the compound comprising the Telecommunications Building(s) and associated 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 join 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.

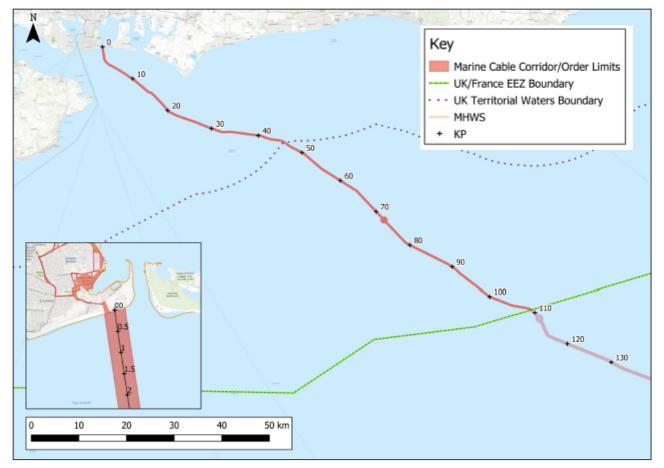


Plate 3.2 - UK Marine Cable Corridor (Mean High Water Springs = MHWS; Mean Low Water Springs = MLWS; KP = Kilometre Point)

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.

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 1 km 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. The FOC Infrastructure will be used for communications between the French and UK Converter Stations in connection with the control and protection systems, and hence is 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. To withstand the various physical impacts which the FOC are likely to be subject to associated with transportation, installation and operation in the marine and underground environment and protect the glass fibres located within it, the FOC are required to be of an adequate outer diameter. Within the required outer diameter for the FOC, 192 glass fibres may be installed. Each FOC is required to include a sufficient amount of glass fibres for its use in connection with the primary use of the interconnector and as redundancy for this purpose in the event of individual glass fibre failures. The number of glass fibres required in connection with the primary use of the interconnector and as redundancy for this purpose is less than 192, though this is a multiple of fibres that is commonly produced by manufacturers of such cables.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 in connection with the proposed use of fibres for commercial telecommunications purposes.
- 3.4.1.22. 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.
- 3.4.1.23. 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.
- 3.4.1.24. 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

- 3.4.1.25. 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.
- 3.4.1.26. Two Onshore HVDC Cable Circuits are proposed to be installed in the Onshore Cable Corridor between Converter Station and the Landfall.
- 3.4.1.27. 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.
- 3.4.1.28. 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.
- 3.4.1.29. 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 on average and typically in 100 m sections, and at 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.

3.4.1.30. 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.



- 3.4.1.31. 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.
- 3.4.1.32. In certain areas the Onshore HVDC Cables will be installed in ducts using HDD or trenchless installation methods.
- 3.4.1.33. 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.
- 3.4.1.34. 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.
- 3.4.1.35. 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.
- 3.4.1.36. 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>

3.4.1.37. 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').

- 3.4.1.38. 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.
- 3.4.1.39. The landward ends of the ducts will be approximately 200m inland of, and at a higher elevation than, the MHWS mark.
- 3.4.1.40. 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.
- 3.4.1.41. 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.
- 3.4.1.42. 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).
- 3.4.1.43. The TJB installation works will take approximately 16 weeks (total for both circuits).
- 3.4.1.44. 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.
- 3.4.1.45. 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.
- 3.4.1.46. The ORS compound construction is expected to take 12 weeks.

Decommissioning

3.4.1.47. The Applicant is seeking consent for installation and operation 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.

3.4.1.48. 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

- 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 marine 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 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)														



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			2	021		2	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															
Converter Station Commissioning	All activities															

* 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.



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3.6. CONSTRUCTION PROGRAMME ONSHORE

- 3.6.1.1. The indicative programme associated with the UK onshore elements of the Proposed Development, outlined in Table 3.2, has informed 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 APP-449), 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 2023
Landfall Construction	Q3 2021 – Q4 2023
Onshore HVDC Cable Installation	Q4 2022 – Q4 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 Zone of Influence ('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 (APP-492 and 493) 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.



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. (APP-494 and 495; Rev 03)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. (APP-496 and 497) 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. (APP-498, Rev 02 and 499) 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.



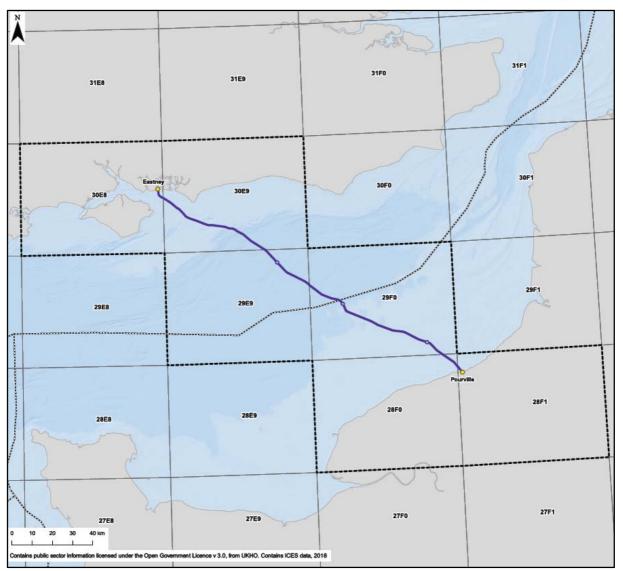


Plate 4.1 - ICES rectangles (bounded by black dotted line) identify the study area for Annex II diadromous migratory fish

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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 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 3, APP-377) 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, APP-492 and 493).

Solent Maritime SAC

- 4.2.2.16. The Solent Maritime SAC covers 113.25 km² 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 m². 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 km². 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

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 km² at a depth range from 8 m to 140 m (JNCC, 2018a; JNCC, 2017a). The French part of this SAC (known as 'ZSC' in French) is called Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC and covers 682.45 km².

Littoral Cauchois SAC

4.2.2.26. An additional SAC located in French waters with close proximity to the Proposed Development is Littoral Cauchois SAC, 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 DIADROMOUS 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, APP-494 and APP-495, Rev 03). 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 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.

Sea lamprey

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.

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- 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, APP-496 and 497).
- 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 km²; 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 km² (Hammond *et al.*, 2017).

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

Species	Occurrence	Distribution	Key references
Harbour porpoise (Phocoena phocoena)	Present year round	Widespread	Evans (2006) Hammond <i>et al</i> . (2017)
Bottlenose dolphin (<i>Tursiops</i> <i>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, APP-498, Rev 02 and 499).
- 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 boas 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 easter 2012a; Navitus Bay Wind Park, 2014). Common eiders are also present in low abundance all along the southern I 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 undertain 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 Win 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 Harbou (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 breedin >50 km from the Proposed Development (WWT, 2009). Breeding fulmar are also present along the French coastline Normandy (Le Guillou & Debout, 2012), located <i>c</i> .54 km from the Proposed Development. Furthermore, there is Alderney within foraging range of the Proposed Development (D. Clifford 2019, pers. comm.). Both Manx shearwar further north, passing through the Channel during migration. Storm petrel also breeding on Alderney, <i>c</i> .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 Pamost frequently recorded species during baseline surveys, with the highest numbers recorded during the breeding swhich is consistent with other surveys (e.g. James <i>et al.</i> , 2010; RSK, 2012). Pettex <i>et al.</i> , (2014, 2017) also identified by



00 km east of the Proposed Development. eys undertaken in 2007 and 2008 which vs. Surveys undertaken more recently for pat-based surveys, and 210 using aerial of the Proposed Development, estimated terly movement in April (Natural England, a English coastline in winter, including in we year mean peak of two individuals in

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

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

Durs (Natural England, 2019). Frost *et al.*, Portsmouth Harbour. In Chichester and 17). Two red-breasted mergansers were Bay Wind Park, 2014), with none reported

es *et al.*, 2010): fulmar, Manx shearwater numbers of Balearic shearwater passing k, 2014). Fulmar have been observed off e Proposed Development (James *et al.*, ing between Brighton and Beachy Head, tline 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), I large numbers of gannets in the eastern

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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 f 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 birds were recorded by Stone <i>et al.</i> , (1995) in coastal areas to the west of the Isle of Wight around Poole Harbour and arou year. Rampion OWF recorded a peak of seven cormorants across its baseline survey campaign (RSK, 2012), whil 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 recorden 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), we at 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 vicindeed, 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 Po
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

ed Development: at the Needles on the at (Barne *et al.*, 1996; Lake *et al.*, 2011). a from the region. Langstone and Poole ive-year mean peak of 66 cormorants in ds/km²) and shags (0.01-0.49 birds/km²) 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 *a 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

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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,
Razorbill; and	and puffins breed along the Purbeck Cliffs, <i>c</i> . 60 km west of the Proposed Development (Barne <i>et al.</i> , 1996; Lake <i>et</i> 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 n more northerly breeding colonies (Navitus Bay Wind Park, 2014).



aded gulls also present at these colonies

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

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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 inland of MLWS, with all European sites within 10 km considered (Plate 5.1 and 5.2).



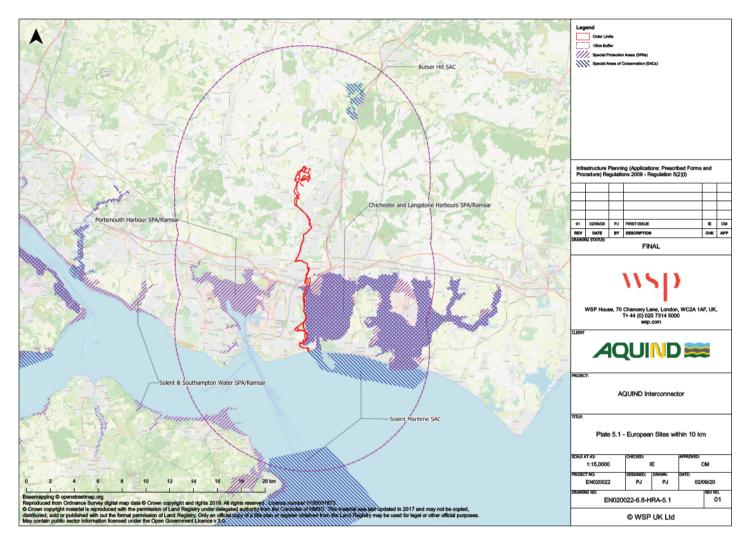


Plate 5.1 – European Sites within 10 km

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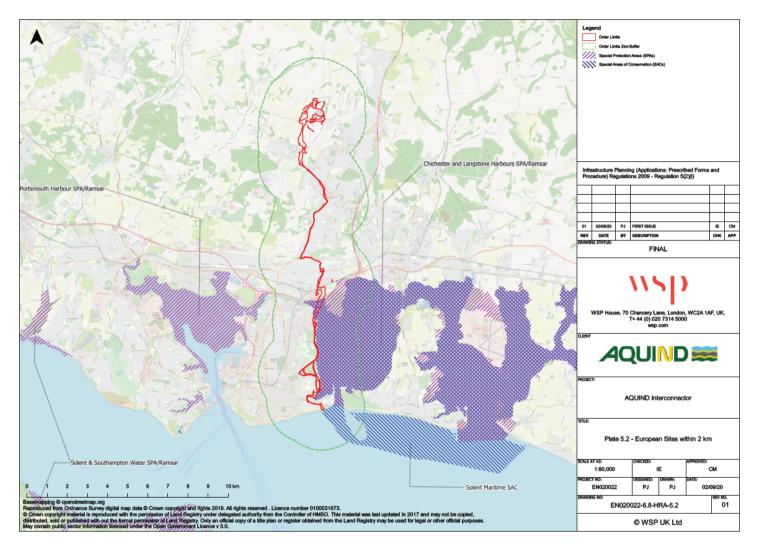


Plate 5.2 – European Sites within 2 km

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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 (species poor semi-improved grassland) with hedgerows and small pockets of woodland, including ancient woodland, and residential development to the southeast. Habitats present in the Converter Station Area include Semi-natural broadleaved and plantation woodland, semi-improved improved grassland, arable and hedgerows. Full details of these habitats are described in the Preliminary Ecological Appraisal (APP-410) and updated within Chapter 10 of the ES Addendum.

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 (APP-410).

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 (APP-410).



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:
 - Preliminary Ecological Appraisal (APP-410)
 – 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 (APP-131) 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 MLWS. A description of the baseline for marine ornithological features seaward of MLWS is presented in Section 4.2.5.

Landfall and Intertidal Environment

- 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 as indicated in the Breeding Bird Survey Report (APP-420) and the Wintering Bird Survey Report (APP-421).
- 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/Ramsar site). 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/Ramsar site, six monthly survey visits were completed between October 2017 and March 2018 (Plate 5.3). These surveys followed prescribed methodology 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 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



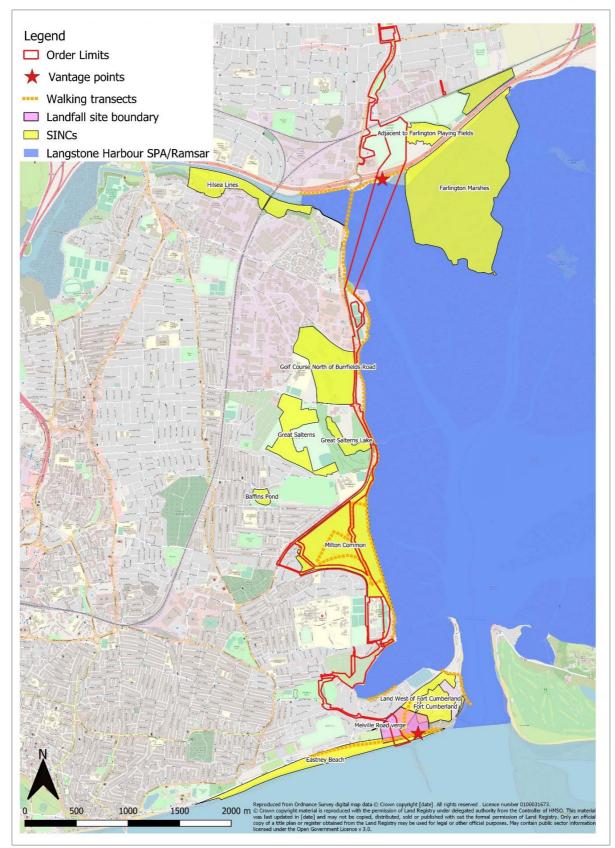


Plate 5.3 – Onshore wintering bird survey locations

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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 (and/or Ramsar) 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 below on species that are qualifying features of Chichester and Langstone Harbours SPA/Ramsar site.

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*)⁴. This species overwinters in the Solent area with Chichester and Langstone Harbour being a favoured site. Brent 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 Waders and Brent Goose Strategy Sites ('SWBGS')

⁴ 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.



(see below) it is possible to conclude that several thousand individual brent geese use the intertidal survey area.

Shelduck

5.1.4.11. Shelduck was relatively abundant during the surveys with peak counts 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 individuals occurred during low tide in December 2017.

Red-breasted Merganser

5.1.4.14. Red-breasted merganser were recorded sporadically during the surveys 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 recorded at low tide when the survey area is dominated by intertidal mud.

Teal

5.1.4.15. Teal were consistently recorded during surveys at both high and low tide with peak counts of 33 (high tide December 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 recorded during high tide. All records were at Eastney Beach with no individuals recorded using the intertidal mud in Langstone Harbour.

Bar-tailed Godwit

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

Black-tailed Godwit

5.1.4.21. Black-tailed godwit were recorded on four low tide surveys with a peak count of 75 birds in October 2017. No individuals of this species were recorded on high tide surveys, indicating that as the tide rises and obscures the mudflat, this species flies out of the survey area to find high tide roosts elsewhere.

Curlew

5.1.4.22. 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, this species fly out of the survey area to find high tide roosts elsewhere.

Redshank

5.1.4.23. 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 therefore widespread in the survey area.

Turnstone

5.1.4.24. 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

5.1.4.25. 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.

Table 5.2 - Results of 2017/2018 intertidal field surveys by month and tide phase⁵

			-	-		•							
Common name	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
Dark-bellied brent goose	Branta bernicla bernicla	408	172	617	333	970	95	667	795	1598	946	715	967
Shelduck	Tadorna tadorna	0	0	6	45	38	7	45	19	66	0	29	5
Teal	Anas crecca	1	0	23	0	46	33	2	8	50	27	0	16
Pintail	Anas acuta	0	0	0	0	18	4	0	1	75	2	53	6
Shoveler	Spatula clypeata	0	0	0	0	2	0	0	0	0	0	0	0
Red-breasted merganser	Mergus serrator	0	2	3	12	1	2	4	0	2	5	0	0
Ringed plover	Charadrius hiaticula	5	58	12	24	1	0	0	19	31	50	0	0
Grey plover	Pluvialis squatarola	10	0	9	0	4	0	19	0	4	1	3	0
Sanderling	Calidris alba	0	0	0	2	4	2	0	0	0	0	0	200
Dunlin	Calidris alpina	398	1	22	1	404	0	66	0	2014	9	167	0
Black-tailed godwit	Limosa limosa	75	0	2	0	3	0	0	0	0	0	27	0
Bar-tailed godwit	Limosa Iapponica	0	0	0	0	0	0	1	0	0	0	0	0
Curlew	Numenius arquata	18	0	15	0	16	0	24	0	61	0	15	2
Redshank	Tringa totanus	75	0	103	0	51	3	16	5	47	0	25	6
Turnstone	Arenaria interpres	34	0	11	0	17	1	6	66	0	3	1	49
Sandwich tern	Thalasseus sandvicensis	6	0	2	0	0	0	0	0	0	0	0	0

⁵ 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.



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
75	0	107
1	0	1
61	2	151
103	6	331
34	66	188
6	0	8

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- 5.1.4.26. 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.
- 5.1.4.27. 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.
- 5.1.4.28. 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

- 5.1.4.29. Breeding bird surveys were undertaken in onshore areas inland of landfall at Eastney Beach, specifically targeting black redstart and Dartford Warbler (APP-420). 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.
- 5.1.4.30. Wintering bird surveys of the same area of terrestrial habitats were also undertaken (APP-421). 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.
- 5.1.4.31. To supplement the surveys of intertidal habitats, parallel surveys of Solent Waders and Brent Goose Strategy sites (SWBGS) were surveyed in parallel (APP-421). 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 Proposed Development are presented in Plate 5.4.
- 5.1.4.32. Surveyors visited 22 sites identified in the SWBGS for the South-East Hampshire Coast. Using direct counts, brent geese, gulls and other species were identified and their numbers and behaviour recorded.



Converter Station Area

5.1.4.33. Breeding bird surveys were completed at the Converter Station Area (APP-420). Species present and confirmed breeding consisted of a suite of widespread species typical of the arable and grassland habitats present. No species recorded were relevant to any regional European sites.



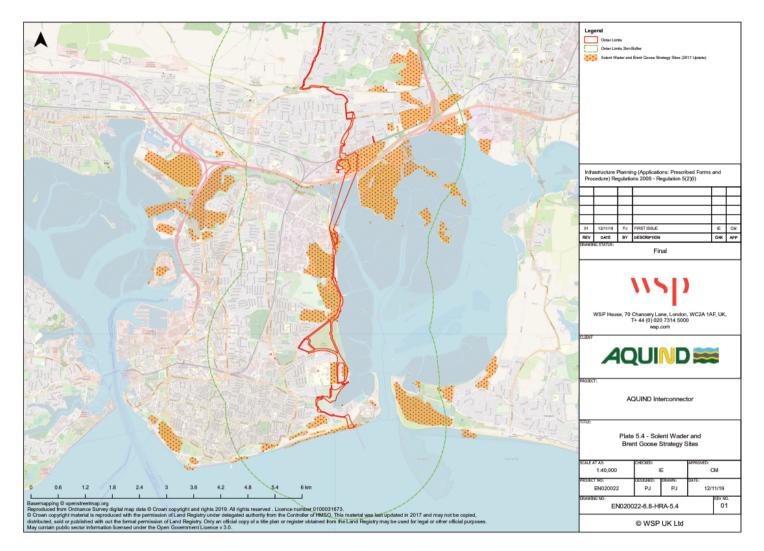


Plate 5.4 – Solent Waders and Brent Goose Strategy Sites

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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.
- 6.1.1.4. Appendix 1 (APP-501, Rev 002) presents the screening matrices for European Marine Sites (i.e. SPA and SACs) and Appendix 5 (document reference 7.7.10) presents the screening matrices for Ramsars. For Ramsar sites, the features



assessed as part of this HRA are those identified under the criteria applied to the designation of the Ramsar site in the relevant Ramsar Information Sheets. The Natural England Designated Sites View⁶ states that a decision has been made by Defra and Natural England not to produce Conservation Advice packages for Ramsars, instead focussing on the production of High Level Conservation Objectives. As the provisions of the Habitats Regulations relating to Habitat Regulations Assessments (HRAs) extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests. Assessments presented in Sections 7, 8 and 10 of this document for Ramsars have been undertaken in line with this approach.

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 four 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 diadromous 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 and Appendix 5 of this report (APP 501, Rev 002 and 7.7.10) 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, APP-368).

⁶ Available online from: <u>https://designatedsites.naturalengland.org.uk/</u>



Pre-Screening of Designated Sites

- 6.2.2.2. The UK 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 (APP-492 and 493) illustrate the locations of sites considered.
- 6.2.2.3. At a minimum distance of 34 km to the south west of the UK 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 UK Marine Cable Corridor, while the French part, Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC, 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 UK 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 SAC, however this site is located 52.7 km from the UK Marine Cable Corridor at its nearest point. There is therefore no connectivity with any Annex I habitats present within the Littoral Cauchois SAC, and effects on Annex I habitats within this SAC 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 feature 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] .
	Coastal lagoons [1150] within the Solent Maritime SAC are located at a minimum distance of 8 km from the Proposed Dev isolated from open waters by means of a sluice or seawall and therefore have no connectivity with the proposed activities, p are 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 sull 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.
	Mudflats and sandflats not covered by seawater at low tide [1140] 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.
	Spartina swards [1320]. Solent Maritime is the only site for smooth cord-grass <i>Spartina alterniflora</i> in the UK and is one of amounts of small cord-grass <i>S. maritima</i> are found. It is also one of the few remaining sites for Townsend's cord-grass (<i>S. x</i> areas of common cord-grass <i>Spartina anglica</i> , all four taxa thus occurring here in close proximity. Connectivity cannot be ex be 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 cannifeature 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.
	Submerged or partially submerged sea caves [8330] 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 exposubmerged sea caves will be considered for LSE within the assessment.
	Reefs [1170] are located in the subtidal area to the east of the Isle of Wight, at a minimum distance of 3.3 km from the Mari 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.



res 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 vity cannot therefore be excluded, and

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

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

marsh. 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
		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]	No – terrestrial feature, no connectivity to marine activities
		Perennial vegetation of stony banks [1220]	No – terrestrial feature, no connectivity to marine activities
		<i>Salicornia</i> 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 SAC	58.8	Annex I habitats	No – outside the ZOI
Littoral Cauchois SAC	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 and Ramsars 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, APP-494). 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, APP-495, Rev 03). 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.

2. Nine 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 SAC	52.7	Twaite shad Sea lamprey River lamprey	Yes
Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC/Baie de Somme Ramsar	84.6	River lamprey	Yes
Baie de Canche et Couloir des trois Estuaires SAC	86.5	Allis shad Sea lamprey River lamprey Salmon	Yes
Estuaire de la Seine ZSC/Marais Vernier Ramsar	90	Salmon Twaite shad Sea lamprey River lamprey	Yes
Baie de Seine Orientale SAC	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/Ramsars 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 SACs⁷ (Appendix 2 of this report, APP-502 and Figures 4-5 and 4-6, APP-496 and 497). 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)⁸;
 - 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 2⁹) 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 SACs 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 SACs/Ramsars. Due to the potential for transboundary effects, these SACs/Ramsars (Table 6.5) have been pre-screened in for further assessment.

⁷ Ramsar sites for which marine mammals were listed as 'species whose presence explains the international importance of the site' were also considered.

⁸ The Wash Ramsar is also present at this location.

⁹ 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 SAC	53	Bottlenose dolphin Harbour porpoise Grey seal Harbour seal	Yes
Ridens et dunes hydrauliques du détroit du Pas-de- Calais SAC	59	Harbour porpoise Grey seal Harbour seal	Yes
Baie de Canche et couloir des trois estuaires SAC	85	Harbour porpoise Grey seal Harbour seal	Yes
Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar ¹⁰	87	Bottlenose dolphin Harbour porpoise Grey seal Harbour seal	Yes
Estuaire de la Seine SAC ¹¹	90	Harbour porpoise Grey seal Harbour seal	Yes
Baie de Seine orientale SAC	91	Bottlenose dolphin Harbour porpoise Grey seal Harbour seal	Yes
Récifs Gris-Nez Blanc- Nez SAC	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

¹⁰ 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.

¹¹ 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 SPA 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/Ramsar and Chichester and Langstone Harbour SPA/Ramsar. 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 UK Marine Cable Corridor passes through this SPA, 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 SPA 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 UK 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/Ramsar site to the boundary of the Proposed Development.
- 6.2.5.6. In discussions with Natural England, pressures and effects on most supporting habitats were screened out of the assessment but it was requested that the potential for LSE on supporting habitat (water column) was considered in addition to marine



ornithology features for UK SPA and Ramsar sites (see Appendix 4 APP-504 and Consultation Report APP-025).

- 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 foraging 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/Marais Vernier Ramsar.

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
Solent and Dorset Coast SPA	0.0 km*	Sandwich tern (B)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	Yes, qual distance o
		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	Yes, qual distance o
		Little tern (B)	Summer visitor present in low to moderate densities within coastal waters between April and September.	6.3 km	Yes, qual distance o
		Supporting habitat (water column)	N/A	N/A	Yes, supp
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, qual distance o
SPA/Ramsar site		Sandwich tern (B)	Summer visitor present in moderate densities within inshore waters between March and September.	49.0 km	Yes, qual the Propo
		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	Yes, qual distance o
		Little tern (B)	Summer visitor present in low to moderate densities within coastal waters between April and September.	6.3 km	Yes, qual distance o
		Supporting habitat (water column)	N/A	N/A	Yes, supp
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, qual distance o
		Supporting habitat (water column)	N/A	N/A	Yes, supp
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, qual distance o
		Common tern (B)	Summer visitor present in moderate densities within inshore waters between April and September.	15.2 km	Yes, qual distance o
		Roseate tern (B)	Summer visitor present in very low densities within inshore waters between May and August.	16.6 km	Yes, qual distance o



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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 of
		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 o
		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	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
	Great cr Black-ne	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 o



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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 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 Propo
		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 c
		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.	et al., 2012) s, N/A Na Sa 49.0 km Na Sa 20.0 km Na Sa 49.0 km Na Sa 15.2 km Na Sa 20.0 km Na Sa 20.0 km Na Sa 20.0 km Na Sa 20.0 km Na Sa N/A Na N/A Na Na N/A Na Na N/A Na Na N/A Na Na N/A	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 Propo
		Great northern diver (W)	Scarce winter visitor, present in very low densities in coastal waters.	N/A	No, no co and Propo
		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 in 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 Propo
		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 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
		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-scree
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 o
		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 o
		Great black-backed gull (B)	Present year-round in low-moderate densities throughout the Channel.	61.1 km***	No, no co and Propo
		Cormorant (B)	Low-moderate densities present year-round in inshore waters.	breeding season foraging range (Thaxter et al., 2012)Yes, qua distances>65.0 kmYes, qua distancea229.4 km**Yes, qua distancea61.1 km***No, no co and Propa61.1 km***No, no co and Propa61.1 kmNo, no co and Propb14.5 kmNo, no co and Propb14.0 kmYes, qua distancec60.0 kmNo, no co and Propa84.2 kmNo, no co and Propb105.4 kmNo, no co and Propc105.4 kmNo, no co and Prop	
		Shag (B)	Low densities present year-round in inshore waters	14.5 km	No, no co and Propo
		Herring gull (B)	Present year-round in moderate densities throughout the Channel.	61.1 km	No, no co and Propo
		Lesser black-backed gull (B)	Present year-round in moderate densities throughout the Channel.	141.0 km	Yes, quali distance d
		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 Propo and speci 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 Propo
		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 Propo
		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 Propo

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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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 3.4) 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 are both 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 into 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 SPA. As the SPA is designated for foraging areas for breeding tern species this is considered to have connectivity with the marine elements of the Proposed Development only. A similar consideration is also given to features which are ordinarily present in the marine environment only (i.e. below MLWS) such as red-breasted 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 site ¹²	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***) Grey plover (W***) Bar-tailed godwit (W) Black-tailed godwit (W**) Red-breasted merganser (W***) Curlew (W*) Shelduck (W***) Redshank (W***) Waterfowl assemblage (W***)	Yes – onshore elements directly a merganser is however considered assessment of marine ornithology onshore elements of the Proposed
olent and Dorset Coast SPA	0.0 km, adjacent	Sandwich tern (B) Little tern (B) Common tern (B)	No - This site is proposed to prote interest features from colonies wit Chichester and Langstone Harbou connectivity with the onshore com considered to occur.
Portsmouth Harbour SPA/Ramsar site	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 t merganser is considered to be a fe of marine ornithology and no LSE components of the Proposed Deve
olent and Southampton Water PA/Ramsar site	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*)	No - although Solent and Dorset c foraging tern species from this SP the SPA area adjacent to the onsh as detailed in the Departmental Br With regards wintering bird feature so that impacts from the onshore e not considered likely.
		Sandwich tern (B*) Waterfowl Assemblage (W***)	

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

¹² Additional species listed on the SPA Review (2001) include Little Egret (P/W), black-tailed godwit (W)



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

tect the marine foraging areas of qualifying ithin 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 velopment.

coast SPA features include provision for PA, these are considered not likely to reach shore element of the Proposed Development Brief for the SPA (Natural England, 2016). Ires, the SPA/Ramsar is sufficiently distant e element of the Proposed Development are

WSP/Natural Power



6.4. POTENTIAL EFFECTS – MARINE ENVIRONMENT

- 6.4.1.1. The following sections should be read in conjunction with Appendix 1 and Appendix 5 (APP-501, Rev 002 and 7.7.10) of this report. Appendix 1 presents the screening matrices for European Marine Sites (e.g. SACs and SPAs) and Appendix 5 presents the screening matrices for Ramsars.
- 6.4.1.2. For Ramsar sites, the features assessed are those features under the criteria applied to the designation of the Ramsar site in the relevant Ramsar Information Sheets. The Natural England Designated Sites View¹³ states that a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to HRA extends to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests. Assessments presented in Sections 7, 8 and 10 of this document for Ramsars have been undertaken in line with this approach.

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, 2020). 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 Maritime¹⁴
 - South Wight Maritime¹⁵
- 6.4.2.3. Each pressure identified is given a risk level (Medium-High risk or Low risk), assessed against each interest feature of a designated site and an interaction type assigned (S

¹³ Available online from: <u>https://designatedsites.naturalengland.org.uk/</u> 14

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030059&SiteName=sole nt%20maritime&SiteNameDisplay=Solent+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=&IF CAArea=&NumMarineSeasonality= Dated 13th March 2020

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030061&SiteName=sout h%20wight&SiteNameDisplay=South+Wight+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=& IFCAArea=&NumMarineSeasonality=Dated 13th March 2020



– 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).

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)
		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) (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)
		Hydrocarbon & Pesticides and Polycyclic Hydrocarbons ('PAH') contamination (C, O, D)
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction of light (C, O, D)
		Introduction or spread of invasive non-indigenous species ('INIS') (C, O, D)
		Barrier to species movement (C, O)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)
		Wave exposure changes (C)
		Emergence regime changes, including tidal level change considerations (C)
	Mudflats and sand	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D)
	flats not	Abrasion/disturbance of the substrate on the surface of the seabed (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)
		Organic Enrichment (C)



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

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



Effect

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

Pollution

Increased light (Pollution) Invasive species EMF Temperature changes

Hydrodynamic changes

Habitat disturbance

Increased SSC

Deposition of sediment (smothering)

Resuspension of contaminated sediments Habitat loss

Pollution

WSP/Natural Power

Site	Qualifying Feature	Pressure
		Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals) (C, O, D)
		Introduction of light (C, O, D)
		Introduction or spread of INIS (C, O, D)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)
		Wave exposure changes (C,)
		Emergence regime changes, including tidal level change considerations (C)
	Spartina swards	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D
		Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
		Vibration (C, O, D)
		Changes in suspended solids (water clarity) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C)
		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)
		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 (C, O)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Emergence Regime Changes (C)
	Atlantic salt	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D
	meadows	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
		Vibration (C, O, D)
		Changes in suspended solids (water clarity) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C)
		Transition elements & organo-metal (e.g. TBT) contamination (C, O, D)
		Habitat structure changes - removal of substratum (extraction) (C, D)



Effect

Increased light (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 EMF

Temperature changes

Hydrodynamic changes Habitat disturbance

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

WSP/Natural Power

Site	Qualifying Feature	Pressure
		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)
		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 (C, O)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Emergence Regime Changes (C)
	Salicornia and	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D)
	other annuals	Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
	colonising mud and	Vibration (C, O, D)
	sand	Changes in suspended solids (water clarity) (C, O, D)
		Smothering and siltation rate changes (Heavy) (C)
		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)
		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 (C, O)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Emergence Regime Changes (C)
South Wight	Reefs	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion (C, O, D)
Maritime		Abrasion/disturbance of the substrate on the surface of the seabed (C, O, D)
		Changes in suspended solids (water clarity) (C, O, D)
		Deoxygenation (C, O, D)
		Organic enrichment (C)



Effect
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 EMF
 Temperature changes
Hydrodynamic changes Habitat disturbance
Increased SSC

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



Effect

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

Pollution

Increased light (Pollution) Invasive species Noise and vibration EMF

Temperature changes

Hydrodynamic changes

Habitat disturbance

Increased SSC

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

Pollution

WSP/Natural Power

Site	Qualifying Feature	Pressure
		Introduction of light (C, O)
		Introduction or spread of INIS (C, O, D)
		Electromagnetic changes (O)
		Temperature decrease (O)
		Temperature increase (O)
		Water flow (tidal current) changes, including sediment transport considerations (C, O, D)
		Emergence Regime Changes (C)



Effect

Increased light (Pollution)
Invasive species
EMF
Temperature changes
Hydrodynamic changes

WSP/Natural Power



6.4.3. ANNEX II DIADROMOUS 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, 2020).
- 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 (APP-124) 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/Ramsars which list Annex II diadromous migratory fish are located outside the Proposed Development (the nearest site is 27.5 km away) and 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 SAC¹⁶
- 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 SAC¹⁷

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https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: August 2020)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: August 2020}



- River Avon SAC^{18,19}
- River Axe SAC²⁰
- Baie de Canche et Couloir des trois Estuaires SAC^{21,22}
- Baie de Seine Orientale SAC^{23,24}
- Littoral Cauchois SAC^{25,26}
- Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC/Baie de Somme Ramsar^{27,28}
- 18

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https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply

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https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: August 2020}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=& NumMarineSeasonality=8 (Accessed: August 2020)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=& NumMarineSeasonality=8 (Accessed: August 2020)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=& NumMarineSeasonality=8 (Accessed: August 2020)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: August 2020}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=& NumMarineSeasonality=8 (Accessed: August 2020)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4 25

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=& NumMarineSeasonality=8 (Accessed: August 2020)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: August 2020}

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=& NumMarineSeasonality=8 (Accessed: August 2020)



Estuaires de la Seine SAC/Marais Vernier Ramsar^{29,30}

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https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030170&SiteName=hum ber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=& NumMarineSeasonality=8

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mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4 {Accessed: August 2020)

https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0013111&SiteName=ply mouth%20sound&SiteNameDisplay=Plymouth+Sound+and+Estuaries+SAC&countyCode=&responsiblePerso n=&SeaArea=&IFCAArea=&NumMarineSeasonality=4

Qualifying Feature	Site	Pressure	Effect	
Salmon	River Itchen SAC*	Changes in suspended solids (water clarity) (C, O, D)	Increased SSC	
	River Avon SAC*	Deoxygenation (O, D) and barrier to species movement (C)		
	Baie de Canche et Couloir des trois Estuaires SAC*	Collision below water with static or moving objects not naturally found in the marine environment (C, O, D)	Physical injury	
	Baie de Seine Orientale SAC*	Habitat structure changes - removal of substratum (extraction) (C, D)	Habitat loss	
	Estuaires de la Seine SAC/Marais Vernier Ramsar*	Introduction or spread of INIS (C, O, D)	Invasive species	
	Namsai	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, O, D)		
		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 SAC* Baie de Seine Orientale SAC*	Changes in suspended solids (water clarity) (C, O, D)	Increased SSC	
		Deoxygenation (O, D) and barrier to species movement (C)		
		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,O, D)		
		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)		
Twaite Shad	Littoral Cauchois SAC*	Changes in suspended solids (water clarity) (C, O, D)	Increased SSC	

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	
	Baie de Seine Orientale SAC*	Deoxygenation (C, O, D) and barrier to species movement (C)		
	Estuaires de la Seine SAC/Marais Vernier Ramsar*	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, O, D)		
		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**	Deoxygenation (O, D) and barrier to species movement (C)	Increased SSC	
	Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC Baie de Canche et Couloir des trois Estuaires SAC** Baie de Seine Orientale SAC**	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, O, 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 SAC**	Deoxygenation (O, D) and barrier to species movement (C)	Increased SSC	
	Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC**	Collision below water with static or moving objects not naturally found in the marine environment (C, O, D)	Physical injury	
	Baie de Canche et Couloir des trois	Habitat structure changes - removal of substratum (extraction) (C, D)	Habitat loss	
	Estuaires SAC**	Introduction or spread of INIS (C, O, D)	Invasive species	



Qualifying Feature	Site	Pressure	Effect
	Baie de Seine Orientale SAC**	Hydrocarbon & PAH contamination (C, O, D)	Pollution events
	Estuaires de la Seine SAC/Marais Vernier Ramsar**	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, O, 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 SACs/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 SACs/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 habitats³¹ 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, APP-501, Rev 002) 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.

³¹ 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

⁽https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0017075&SiteName=the +wash&SiteNameDisplay=The+Wash+and+North+Norfolk+Coast+SAC&countyCode=&responsiblePerson=& SeaArea=&IFCAArea) [accessed August 2020]. During consultation, Natural England requested that the supporting habitat 'water column' be considered for UK SACs.

Features	Site	Pressure	Effect
Bottlenose dolphin ³²	Estuaires et littoral picards (baies de Somme et d'Authie) SAC	No pressures listed	Auditory injury
	Littoral Cauchois SAC	Physical disturbance: displacement, visual, noise	Disturbance
	Baie de Seine orientale SAC	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
larbour porpoise ³³	Récifs Gris-Nez Blanc-Nez SAC	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 SAC	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 SAC	navigation, breeding, socialising), habitat change/loss	
	Estuaires et littoral picards (baies de Somme	Death or injury by collision - mortality, injury	Collision
	et d'Authie) SAC	Anthropogenic underwater sound - mortality, internal injury, disturbance leading to physical and acoustic behavioural changes (potentially impacting foraging,	Indirect effects
	Littoral Cauchois SAC	navigation, breeding, socialising), habitat change/loss	
	Baie de Seine orientale SAC	Contaminants - effects on water and prey quality, bioaccumulation through	Pollution
	Estuaire de la Seine SAC	contaminated prey ingestion, health issues (e.g. on reproduction)	

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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³² 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).

³³ 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://jncc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf).

Features	Site	Pressure	Effect
Grey seal ³⁴	Récifs Gris-Nez Blanc-Nez SAC	No pressures listed	Auditory injury
	Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC	Physical disturbance: displacement, visual, noise	Disturbance
	Baie de Canche et couloir des trois estuaires SAC	Potential electro-magnetic effects of electrical cables (operational phase only) Physical disturbance: collision, noise, visual	
	Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar	Physical disturbance: collision, noise, visual	Collision
	Littoral Cauchois SAC	Geophysical regime: addition of artificial substrate; local modification of water movement	Indirect effects
	Baie de Seine orientale SAC Estuaire de la Seine SAC	Geophysical regime: vessel wash - substrate erosion, local modification of wave exposure regime	
Lottane		Fundamental environmental parameters: turbidity	
		No pressures listed	Pollution
larbour seal ³⁵	Récifs Gris-Nez Blanc-Nez SAC	Underwater noise changes	Auditory injury
	Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC	Vibration	
	Baie de Canche et couloir des trois estuaires	Above water noise	Disturbance
	SAC	Introduction of light	
	Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar	Underwater noise changes	
	Littoral Cauchois SAC	Vibration	
	Baie de Seine orientale SAC	Visual disturbance	
	Estuaire de la Seine SAC	Barrier to species movement (operational phase only for power cables, construction phase only for HDD)	
		Collision below water with static or moving objects not naturally found in the marine environment	Collision

 ³⁴ 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>).
 ³⁵ 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=&NumMarineSeasonality=2) (accessed August 2020).
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Site	Pressure	Effect
	Introduction or spread of INIS	Indirect effects
	Hydrocarbon and PAH contamination	Pollution
	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	
	Transition elements and organo-metal (e.g. TBT) contamination Introduction of other substances (solid, liquid or gas) (not listed for power cables.	
	Site	Introduction or spread of INIS Hydrocarbon and PAH contamination Litter Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)





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 SPA³⁶;
 - Portsmouth Harbour SPA³⁷;
 - Solent and Southampton Water SPA³⁸; and
 - Pagham Harbour SPA³⁹.
- 6.4.5.2. Potential pressures identified for these European sites were applied to those features of European sites and Ramsars where Advice on Operations was not available. This approach was applied to:
 - Solent and Dorset Coast SPA;
 - Alderney West Coast and Burhou Islands Ramsar; and
 - Littoral Seino-Marin ZPS/SPA.
- 6.4.5.3. Cabling activities considered included:
 - Cables Cables: HDD;
 - Cables Power cable: Laying, burial and protection;
 - 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 pressure was not assessed (NA) for feature sensitivity. For transboundary sites, feature sensitivity (interaction type) was not available.

³⁸<u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011061&SiteName=sol</u> ent&SiteNameDisplay=Solent+and+Southampton+Water+SPA&countyCode=&responsiblePerson=&SeaArea =&IFCAArea=&NumMarineSeasonality=9 (Accessed August 2020)

³⁶<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=&NumMarineSeasonality=18</u> (Accessed August 2020)

³⁷<u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011051&SiteName=portsmouth&SiteNameDisplay=Portsmouth+Harbour+SPA&countyCode=&responsiblePerson=&SeaArea=&IFC AArea=&NumMarineSeasonality=4 (Accessed August 2020)</u>

³⁹<u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9012041&SiteName=pagham&SiteNameDisplay=Pagham+Harbour+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea =&NumMarineSeasonality=4 (Accessed August 2020)</u>



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 (APP-126) for the Proposed Development.

Table 6.11 - Potential effects on marine ornithology features across all phases of the Proposed Development. The pressures relate to all phases of the project (i.e. construction, operation and decommissioning) unless otherwise stated.

Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features	Transboundary site interaction
Solent and Dorset Coast 0.0 km SPA	0.0 km	Above water noise	Disturbance and displacement	Sandwich tern Common tern Little tern	-
		Underwater noise changes		Sandwich tern Common tern Little tern Supporting habitat (water column)	-
		Visual disturbance	ement HDD in ')' ith static ith static solids Indirect effects Sandwid Common Little ter Support column) Little ter Support column Little ter Support column Little ter Support column) Little ter Support column Little ter Support column Little ter Support column Little ter Support column Little ter Support column Little ter Support column Little ter Support column Little ter Support column Little ter Support Support Support Support Support Support Support Support Support Support Support Support Support	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)	-
		Barrier to species movement (Operational phase and HDD in construction phase only)		Little tern Supporting habitat (water column)	-
		Collision above water with static or moving objects		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)		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)	-



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		(Construction and decommissioning phases only)		
		Physical loss (to land or freshwater) (Operational phase and cable lay/burial/protection period of construction phase only)		Supporting habitat (water column)
		Water flow (tidal current) changes, including sediment transport considerations		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Emergence regime changes, including tidal level change considerations (HDD in construction phase only)		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)
		Wave Exposure changes (HDD period of construction phase only)		Supporting habitat (water column)
		Organic enrichment (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another seabed type) (HDD in construction phase only)		Supporting habitat (water column)
		Physical change (to another sediment type) (HDD in construction phase only)		Supporting habitat (water column)
		Electromagnetic changes (Operational phase only)		Supporting habitat (water column)
		Temperature decreases (Operational phase only)		Supporting habitat (water column)
		Temperature increases (Operational phase only)		Supporting habitat (water column)
		Hydrocarbon and Polycyclic Aromatic Hydrocarbon ('PAH') contaminants	Accidental spills	Sandwich tern Common tern Little tern



Transboundary site interaction
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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
				Supporting habitat (water column)
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Sandwich tern Common tern Little tern Supporting habitat (water column)
		Introduction of other substance (solid, liquid, gas) (HDD in construction phase only)		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
		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



Transboundary site interaction
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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
				Supporting habitat (water column)
		Vibration		Supporting habitat (water column)
		Barrier to species movement (Operational phase and HDD in construction phase only)		Little tern Red-breasted merganser 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	ing objects es in suspended solids Indirect effects	Red-breasted merganser Sandwich tern Common tern Little tern
		Changes in suspended solids (water clarity)		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 (Construction and decommissioning phases only)		Supporting habitat (water column)
		Physical loss (to land or freshwater) (Operational phase and cable lay/burial/protection period of construction phase only)		Supporting habitat (water column)
	changes,	Water flow (tidal current) changes, including sediment transport considerations		Red-breasted merganser Sandwich tern Common tern Little tern 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
		Emergence regime changes, including tidal level change considerations (HDD period of construction phase only)		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)
		Wave Exposure changes (HDD period of construction phase only)		Red-breasted merganser Supporting habitat (water column)
		Organic enrichment (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another seabed type) (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another sediment type) (HDD period of construction phase only)		Supporting habitat (water column)
		Electromagnetic changes (Operational phase only)		Supporting habitat (water column)
		Temperature decreases (Operational phase only)		Supporting habitat (water column)
		Temperature increases (Operational phase only)		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)
		Introduction of other substance (solid, liquid, gas) (HDD period of construction phase only)		Sandwich tern Common tern Little tern



Transboundary site interaction
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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
				Red-breasted merganser 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		Red-breasted merganser
		Underwater noise changes		Red-breasted merganser Supporting habitat (water column)
		Introduction of light		Red-breasted merganser Supporting habitat (water column)
		Vibration		Supporting habitat (water column)
		Barrier to species movement (Operational phase and HDD period of construction phase only)		Red-breasted merganser 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)		Red-breasted merganser Supporting habitat (water column)
		Deoxygenation		Supporting habitat (water column)
		Nutrient enrichment		Supporting habitat (water column)



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Habitat structure changes – removal of substratum (Construction and decommissioning phases only)		Supporting habitat (water column)
		Physical loss (to land or freshwater) (Operational phase and cable lay/burial/protection period of construction phase only)		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 (HDD period of construction phase only)		Red-breasted merganser Supporting habitat (water column)
		Transition elements and organometal contamination		Red-breasted merganser Supporting habitat (water column)
		Wave Exposure changes (HDD period of construction phase only)		Red-breasted merganser Supporting habitat (water column)
		Organic enrichment (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another seabed type) (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another sediment type) (HDD period of construction phase only)		Supporting habitat (water column)
		Electromagnetic changes (Operational phase only)		Supporting habitat (water column)
		Temperature decreases (Operational phase only)		Supporting habitat (water column)
		Temperature increases (Operational phase only)		Supporting habitat (water column)
		Hydrocarbon and PAH contaminants	Accidental spills	Red-breasted merganser Supporting habitat (water column)
		Synthetic compound contamination (incl. pesticides,		Red-breasted merganser



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		antifoulants and pharmaceuticals) Introduction of other substances (solid, liquid, gas)		Supporting habitat (water column) 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	U Vi In Vi Bi (D pe	Above water noise	Disturbance and displacement	Sandwich tern Common tern Roseate tern Little tern Mediterranean gull
		Underwater noise changes		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)
		Barrier to species movement (Operational phase and HDD period of construction phase only)		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
		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 Supporting habitat (water column)
		Deoxygenation		Supporting habitat (water column)
		Nutrient enrichment		Supporting habitat (water column)
		Habitat structure changes – removal of substratum (Construction and decommissioning phases only)		Supporting habitat (water column)
		Physical loss (to land or freshwater) (Operational phase and cable lay/burial/protection period of construction phase only)		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 (HDD period of construction phase only)		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Transition elements and organometal contamination		Sandwich tern Common tern Roseate tern Little tern Mediterranean gull Supporting habitat (water column)
		Wave Exposure changes (HDD period of construction phase only)		Supporting habitat (water column)
		Organic enrichment (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another seabed type) (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another sediment type) (HDD period of construction phase only)		Supporting habitat (water column)
		Electromagnetic changes (Operational phase only)		Supporting habitat (water column)
		Temperature decreases (Operational phase only)		Supporting habitat (water column)
		Temperature increases (Operational phase only)		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)
		Introduction of other substance (solid, liquid, gas) (HDD period of construction phase only)		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 Supporting habitat (water column)
		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 gull Supporting habitat (water column)
Pagham Harbour	9.5 km	Above water noise	Disturbance and displacement	Common tern
SPA/Ramsar site		Underwater noise		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)
		Barrier to species movement (Operational phase and HDD period of construction phase only)		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)



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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 (Construction and decommissioning phases only)		Supporting habitat (water column)
		Physical loss (to land or freshwater) (Operational phase and cable lay/burial/protection period of construction phase only)		Supporting habitat (water column)
		Water flow (tidal current) changes, including sediment transport considerations		Common tern Supporting habitat (water column)
		Emergence regime changes, including tidal level change considerations (HDD period of construction phase only)		Common tern Supporting habitat (water column)
		Transition elements and organometal contamination		Common tern Supporting habitat (water column)
		Wave Exposure changes (HDD period of construction phase only)		Supporting habitat (water column)
		Organic enrichment (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another seabed type) (HDD period of construction phase only)		Supporting habitat (water column)
		Physical change (to another sediment type) (HDD period of construction phase only)		Supporting habitat (water column)
		Electromagnetic changes (Operational phase only)		Supporting habitat (water column)
		Temperature decreases (Operational phase only)		Supporting habitat (water column)
		Temperature increases (Operational phase only)		Supporting habitat (water column)
		Hydrocarbon and PAH contaminants	Accidental spills	Common tern Supporting habitat (water column)



Transboundary site interaction
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Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
	Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Common tern Supporting habitat (water column)
	Introduction of other substance (solid, liquid, gas) (HDD period of construction phase only)		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)
30.6 km	Above water noise	Disturbance and displacement	-
	Visual disturbance		-
	Underwater noise changes		-
	Introduction of light		-
	Vibration	-	
	Barrier to species movement (Operational phase and HDD period of construction phase only)		
	SPA/Ramsar to Proposed Development	SPA/Ramsar to Proposed Synthetic compound Development Synthetic compound Synthetic compound Contamination (incl. pesticides, antifoulants and pharmaceuticals) Introduction of other substance (solid, liquid, gas) (HDD period of construction phase only) Litter Introduction or spread of INIS 30.6 km Above water noise Visual disturbance Visual disturbance Underwater noise changes Introduction of light Vibration Barrier to species movement (Operational phase and HDD period of construction phase Souther to species movement	SPA/Ramsar to Proposed Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals) Introduction of other substance (solid, liquid, gas) (HDD period of construction phase only) Litter 1 Litter Litter 30.6 km Above water noise Disturbance and displacement 30.6 km Above water noise Disturbance and displacement 1 Introduction of light Introduction of light 1 Introduction of light Introduction of light



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Fulmar Great black-backed gull Herring gull Kittiwake
Fulmar Great black-backed gull Herring gull Kittiwake Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake Supporting habitat (water column)
Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake Supporting habitat (water column)

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	-
		Deoxygenation		
		Nutrient enrichment		
		Habitat structure changes – removal of substratum (Construction and decommissioning phases only)		
		Physical loss (to land or freshwater) (Operational phase and cable lay/burial/protection period of construction phase only)		
		Water flow (tidal current) changes, including sediment transport considerations		-
		Emergence regime changes, including tidal level change considerations (HDD period of construction phase only)		-
		Transition elements and organometal contamination		-



Fulmar Great black-backed gull Herring gull Kittiwake
Fulmar Great black-backed gull Herring gull Kittiwake
Fulmar Great black-backed gull Herring gull Kittiwake Supporting habitat (water column)
Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake

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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Wave Exposure changes (HDD period of construction phase only)		
		Organic enrichment (HDD period of construction phase only)		
		Physical change (to another seabed type) (HDD period of construction phase only)		
		Physical change (to another sediment type) (HDD period of construction phase only)		
		Electromagnetic changes (Operational phase only)		
		Temperature decreases (Operational phase only)		
		Temperature increases (Operational phase only)		
		Hydrocarbon and PAH contaminants	Accidental spills	-
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		-
		Introduction of other substance (solid, liquid, gas) (HDD period of construction phase only)		
		Litter	Litter	



Supporting habitat (water column)
Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake
Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake
Supporting habitat (water column)
Supporting habitat (water column)
Fulmar Great black-backed gull Herring gull Kittiwake
Supporting habitat (water column)

WSP/Natural Power

Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		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 changes		-
		Introduction of light		-
		Vibration		
		Barrier to species movement (Operational phase and HDD period of construction phase only)		
		Collision above water with static or moving objects		-
		Collision below water with static or moving objects		-
		Changes in suspended solids (water clarity)		-



Fulmar Great black-backed gull Herring gull Kittiwake
Supporting habitat (water column)
Gannet
Storm petrel Lesser black-backed gull
Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
Supporting habitat (water column)
Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
Gannet Storm petrel Lesser black-backed gull
Gannet Storm petrel Lesser black-backed gull
Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)

WSP/Natural Power

Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Deoxygenation		
		Nutrient enrichment		
		Habitat structure changes – removal of substratum (Construction and decommissioning phases only)		
		Physical loss (to land or freshwater) (Operational phase and cable lay/burial/protection period of construction phase only)		
		Water flow (tidal current) changes, including sediment transport considerations		-
		Emergence regime changes, including tidal level change considerations (HDD period of construction phase only)		-
		Transition elements and organometal contamination		-
		Wave Exposure changes (HDD period of construction phase only)		
		Organic enrichment (HDD period of construction phase only)		
		Physical change (to another seabed type) (HDD period of construction phase only)		
		Physical change (to another sediment type) (HDD period of construction phase only)		
		Electromagnetic changes (Operational phase only)		



Supporting habitat (water column) Supporting habitat (water column) Supporting habitat (water column)

Supporting habitat (water column)

Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column) Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column) Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column) Supporting habitat (water column)

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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Temperature decreases (Operational phase only)		
		Temperature increases (Operational phase only)		
		Hydrocarbon and PAH contaminants	Accidental spills	-
		Synthetic compound contamination (incl. pesticides, antifoulants, Pharmaceuticals)		-
		Introduction of other substance (solid, liquid, gas) (HDD period of construction phase only)		
		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
	Supporting habitat (water column)
	Supporting habitat (water column)
	Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
	Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
	Supporting habitat (water column)
	Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
	Gannet Storm petrel Lesser black-backed gull Supporting habitat (water column)
ied	as a pressure-effect

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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 relevant 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/Ramsar^{40,41}; and
 - Portsmouth Harbour SPA/Ramsar^{42,43};
- 6.5.1.2. 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 the black-tailed godwit feature of Chichester and Langstone Harbours Ramsar site.
- 6.5.1.3. 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, (as summarised inTable 6.12 below).
- 6.5.1.4. 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 pressure was not assessed (NA) for feature sensitivity.
- 6.5.1.5. 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. Table 6.12 identifies supporting habitats for relevant sites where low and medium-high risk pressures are noted within Natural England's Designated Sites View for Advice on Operations. Supporting habitats within Table 6.12 are not identified individually.

⁴⁰<u>https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011011&SiteName=chi chester&SiteNameDisplay=Chichester+and+Langstone+Harbours+SPA&countyCode=&responsiblePerson=& <u>SeaArea=&IFCAArea=&NumMarineSeasonality=18</u> (Accessed August 2020) ⁴¹ https://rsis.ramsar.org/ris/378 (Accessed August 2020)</u>

⁴²https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011051&SiteName=po rtsmouth&SiteNameDisplay=Portsmouth+Harbour+SPA&countyCode=&responsiblePerson=&SeaArea=&IFC AArea=&NumMarineSeasonality=4 (Accessed August 2020)

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⁴³ https://rsis.ramsar.org/ris/720 (Accessed August 2020)

Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
Development 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 Black-tailed godwit Curlew Shelduck Redshank Waterfowl assemblage
		Above water noise		Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Black-tailed godwit Curlew Shelduck Redshank Waterfowl assemblage
		Introduction of light		Sandwich tern Little tern Common tern Pintail Shoveler

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





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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Vibration (construction phase		Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Black-tailed godwit Curlew Shelduck Redshank Waterfowl assemblage Supporting habitat (freshwa
		only)		and coastal grazing marsh)
		Physical loss (to land or freshwater (construction phase only)	Indirect effects	Supporting habitat (freshwa and coastal grazing marsh)
		Transition elements and organometal contamination		Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Black-tailed godwit Black-tailed godwit Curlew Shelduck Redshank Watefowl assemblage Supporting habitat (freshwa and coastal grazing marsh)
		Hydrocarbon and PAH contaminants	Accidental spills	Sandwich tern Little tern Common tern



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		PintailShovelerTealWigeonTurnstoneDark-bellied brent gooseSanderlingDunlinGrey ploverRinged PloverBar-tailed godwitBlack-tailed godwitCurlewShelduckRedshankWaterfowl assemblageSupporting habitat (freshwaand coastal grazing marsh)Sandwich ternLittle ternCommon ternPintailShovelerTealWigeonTurnstoneDark-bellied brent gooseSanderlingDunlinGrey ploverRinged PloverBar-tailed godwitBlack-tailed godwitBlack-tailed godwitBlack-tailed godwitWaterfowl assemblageSupporting habitat (freshwaand coastal grazing marsh)
		Litter	Litter	Sandwich tern Little tern Common tern Pintail Shoveler



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
				Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover Ringed Plover Bar-tailed godwit Black-tailed godwit Curlew Shelduck Redshank Waterfowl assemblage Supporting habitat (freshwate and coastal grazing marsh)
		Introduction or spread of INIS	INIS**	Sandwich tern Little tern Common tern Pintail Wigeon Turnstone Dark-bellied brent goose Dunlin Grey plover Shelduck Redshank Waterfowl assemblage Supporting habitat (freshwate and coastal grazing marsh)
Portsmouth Harbour SPA/Ramsar site	4.9 km	Visual disturbance	Disturbance and displacement	Dark-bellied brent goose Dunlin Black-tailed godwit
		Above water noise		Dark-bellied brent goose Dunlin Black-tailed godwit
		Introduction of light		Dark-bellied brent goose Dunlin Black-tailed godwit
		Vibration		Supporting habitat (freshwate and coastal grazing marsh)



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Relevant SPA/Ramsar site	Indicative distance from SPA/Ramsar to Proposed Development	Pressure	Effect	Features
		Physical loss (to land or freshwater)	Indirect effects	Supporting habitat (freshwa and coastal grazing marsh)
		Transition elements and organometal contamination		Supporting habitat (freshwat and coastal grazing marsh)
		Hydrocarbon and PAH contaminants	Accidental spills	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat (freshwat and coastal grazing marsh)
		Synthetic compound contamination (incl. pesticides, antifoulants and pharmaceuticals)		Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat (freshwat and coastal grazing marsh)
		Litter	Litter	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat (freshwat and coastal grazing marsh)
		Introduction or spread of INIS	INIS**	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat (freshwat and coastal grazing marsh)



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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 screening matrices presented in Appendix 1 and Appendix 5 (APP-501, Rev 002 and 7.7.10) which assess the European Marine Sites (i.e. SACs and SPAs) and Ramsars respectively. The matrices 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 of this document 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 ² ne KP0.76.
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	However, the project design only proposes the use of HDI exit/entry point located between KP1.0 and KP1.6 (approx SAC). Therefore, there is no pathway for the Proposed D
		Spartina swards [1320]	N	disturbance to the SAC.
		Atlantic salt meadows [1330]	Ν	Therefore, there is no potential for habitat disturbance to A LSE.
		Salicornia and other annuals colonising mud and sand [1310]	Ν	
	Increased SSC	Estuaries [1130]	Y	During dredge disposal, peak SSC of 1000 mgl ⁻¹ could ari
		Sandbanks which are slightly covered by sea water all the time [1110]	Y	but coarser sediment expected to fall out of suspension que significant reductions of SSC within hours of disposal at earlies, the passive plume which is transported beyond the grade of a provide the dimension
		Mudflats and sandflats not covered by seawater at low tide [1140]	Y	region of approximately 20 mgl ⁻¹ , transported in the directi 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 r 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 HE potentially persist for several hours following completion o
		Salicornia and other annuals colonising mud and sand [1310]	Y	plumes are also likely to be transported up to 5 km away f concentrations of 5 to 10 mgl ⁻¹ 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 low (< 5 mgl ⁻¹) and therefore not discernible above natural
				Due to the close proximity of the Solent Maritime SAC (inc of which is located less than 1 km from the Marine Cable of 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 to
	sediment (smothering)	Sandbanks which are slightly covered by sea water all the time [1110]	Y	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- codiments will be redictributed and any deposition outside
		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 ction of the prevailing flow out to a 6 mgl⁻¹ within the timeframe of a few

d maintenance) also have the potential at peak SSCs of up to 200 mgl⁻¹ may be IDD pit) and these concentrations could of construction activities. Sediment v from the trench or pit at which point bected to return to background levels to The finest sediments will potentially vever SSCs at these distances will be ral variation.

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

to the point of release (i.e. within 1000 ved to depths of between 10 mm and 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 qu tidal flows.
		Atlantic salt meadows [1330]	Y	Other cable installation activities (including for repair and r
		Salicornia and other annuals colonising mud and sand [1310]	Y	to result in sediment deposition. 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 characteristic deposition.
		Spartina swards [1320]	N	seabed type as any deposition that does occur will be of sibe 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 d
		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 accidentally (inappropriate storage) or deliberately (Potts a
		Atlantic salt meadows [1330]	Y	Mouat, 2009). Shipping related litter contributes approximate beaches.
		Salicornia and other annuals colonising mud and sand [1310]	Y	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, leak into the environment can occur.



quickly redistributed under the forcing of

d maintenance) also have the potential

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

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

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

vithin the Solent Maritime SAC, and no

terial 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,

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

WSP/Natural Power

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]	Ν	Results from the subtidal contaminated sediment survey (
	contaminated sediments	Sandbanks which are slightly covered by sea water all the time [1110]	N	Sediment Quality), indicate that the sediments within the l significantly elevated levels of contaminants with no recor Cefas Action Level 2. In addition, for all contaminants other Action Level 1 was reported. Argonic did exceed Action Level
		Mudflats and sandflats not covered by seawater at low tide [1140]	Ν	Action Level 1 was recorded. Arsenic did exceed Action L at one of these was it above the Oslo and Paris Convention Assessment Concentration) however these appear isolate
		Spartina swards [1320]	Ν	 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 mud and sand [1310]	N	The lack of contamination in the nearshore sediments with indicates that there is a very low risk of sediment borne constant water column. As such, it is therefore concluded that there this effect.
	Invasive species	Estuaries [1130]	Y	The introduction and INIS can occur directly through the reint into the environment via activities, e.g. through release of
	Invasive species	Sandbanks which are slightly covered by sea water all the time [1110]	Y	hull of ships even if recently cleaned or anti-fouled (Intern 2012; Davidson <i>et al.</i> , 2010), or indirectly by creating oppo- spread (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 nav 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]	Ν	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 pred including Geostatic field) (Chapter 3 Description of the Pro is broadly equivalent to the background geostatic field.



result of pollution (including litter)

(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 busy shipping channel and already avigation, ports and flood protection

he Marine Cable Corridor, such as the sostrea (Magallana) gigas), Chinese a 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 μ T (50 μ T Proposed Development, APP-118). This

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SAC	Effect	Feature	LSE?	Justification
				The majority of the research relating to the environmenta 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 prec 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. Lig
	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; Montevecch 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



tal effects of EMF is migratory behaviour such as elasmobranchs (Gill and Bartlett, to be electro or magneto-sensitive, mental effects on benthic organisms. red to background levels it is concluded

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

tal effects of EMF is migratory behaviour such as elasmobranchs (Gill and Bartlett, to be electro or magneto-sensitive, mental effects on benthic organisms. red to background levels, it is concluded

orridor and as such no effects on this SE.

orridor and as such no effects on this SE.

orridor and as such no effects on this SE.

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

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

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

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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 Intert 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.
				assessment demonstrates that any substantial temperature the seabed. Further, HDD methods propose target burial feature) is 5 m. HDD methods resulting in cable burial to the temperature locally, however the cable will be contained we distance to the surface sediments, it is concluded that tem detectable at the surface. Therefore, there is no potential
		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 detectable at the surface (due to HDD methods resulting 5 m). Therefore, there is no potential for LSE.
		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]	N	Temperature effects will not extend outwith the Marine Ca on this feature are likely. Therefore, there is no potential
		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



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 ertek, 2011; Nemo Link, 2013). Thermal es, transmission rate and the receiving

ble usually increases with increasing the nk Interconnector project (Nemo Link, in 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

regarding potential heat emissions from es (document reference 7.8.1). The a target burial depth of 1 m, and thermal ture increase will not be detectable at al depth beneath the SAC (and this o 5 m are likely to maintain a higher d within a duct and when considering the emperature increases will not be al for LSE.

cts of heat on Sandbanks which are ed that temperature increases will not be g in burial under the qualifying feature of

Cable Corridor and as such no effects 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
	Hydrodynamic	Estuaries [1130]	N	A number of activities can affect hydrodynamic processes protection, removal of bedforms or the creation of depress
	changes	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
		Mudflats and sandflats not covered by seawater at low tide [1140]	N	The Physical Processes assessment concluded that any small, highly localised and temporary resulting from near elevated turbulence intensities as a result of the work.
		Spartina swards [1320]	N	All work will be undertaken at and beyond the HDD entry/
		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 to 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 ⁻¹ could ari but coarser sediment expected to fall out of suspension que significant reductions of SSC within hours of disposal at earelease, the passive plume which is transported beyond the region of approximately 20 mgl ⁻¹ , transported in the direct distance of c. 25km. SSC is predicted to reduce to <1 – 6 completion of disposal activities. Background SSC coastan Physical Processes). 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 HE potentially persist for several hours following completion of plumes are also likely to be transported up to 5 km away for concentrations of 5 to 10 mgl ⁻¹ are predicted. SSC is expen- within a few days following completion of these activities. be transported up to 6-10 km in the nearshore area, howe low (< 5 mgl ⁻¹) and therefore not discernible above natura The closest example of this feature is 10 km from the UK
				considered that the potential for LSE (at any stage) on this
		Reefs [1170]	Y	During dredge disposal, peak SSC of 1000 mgl ⁻¹ could are but coarser sediment expected to fall out of suspension que significant reductions of SSC within hours of disposal at e release, the passive plume which is transported beyond the



es including installation of cable ssions created through installation changes resulting from the Proposed esses) of the ES Volume 1 (APP-121).

/ hydrodynamic changes will be very r bed flow velocities and slightly

y/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 e qualifying features of the SAC are

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⁻¹ within a few days following tal areas is 5 to 75 mgl⁻¹ (Chapter 6

d maintenance) also have the potential at peak SSCs of up to 200 mgl⁻¹ 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 s. The finest sediments will potentially wever SSCs at these distances will be ral variation.

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

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

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SAC	Effect	Feature	LSE?	Justification
				region of approximately 20 mgl ⁻¹ , 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 ⁻¹ 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 low (< 5 mgl ⁻¹) and therefore not discernible above natura The closest example of this feature is 3.3 km from the Ma considered that the potential for LSE (at any stage) on thi
	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 deposition. Finer sediments will be redistributed and any deposition of predicted to be transient and negligible, with any settled n under 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 observed 1.5 m, with greatest deposition observed across an area of the direction of the prevailing flow at the time of release, references and the transients will be redistributed and any deposition of predicted to be transient and negligible, with any settled munder the forcing of tidal flows. Other cable installation activities (including for repair and to result in sediment deposition. 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.



ction of the prevailing flow out to a ground levels (<1 – 6 mg/l) within the l activities.

d maintenance) also have the potential at peak SSCs of up to 200 mgl⁻¹ 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 s. The finest sediments will potentially vever SSCs at these distances will be ral variation.

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

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.

d maintenance) also have the potential

outside the Marine Cable Corridor are material being quickly redistributed

, it is considered that LSE (at any

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.

outside the Marine Cable Corridor are material being quickly redistributed

d maintenance) also have the potential

n), it is considered that LSE (at any

ime SAC and therefore there is no

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SAC	Effect	Feature	LSE?	Justification
		Reefs [1170]	N	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] Reefs [1170]	Y	 Marine litter is any manufactured or processed solid material discarded, disposed or abandoned (excluding legitimate of coastal environment including plastics, metals, timber, round degraded components, e.g. microplastic particles (Natural can be physical (smothering), biological (ingestion, include 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 approximate beaches. Deliberate discharges of oil or oil/water mixtures and synther 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, lead into the environment can occur. It is therefore considered that the potential for LSE as a restrict of the synthesis of the potential for LSE as a restrict.
	Invasive species	Submerged or partially submerged sea caves [8330]	Y	cannot be ruled out. The introduction and spread of INIS can occur directly thr species into the environment via activities, e.g. through re
		Reefs [1170]	Υ	 on the hull of ships even if recently cleaned or anti-fouled indirectly by creating opportunities for organisms to settle disturbance), thereby allowing for them to out-compete national structure (in the form of cable protection), which has introduction and spread of INIS. However, this area is a k possesses significant hard substrate modifications for national substrates. There are several INIS species known to be present in the slipper limpet, <i>Crepidula fornicata</i>, Pacific oyster (<i>Crassos mitten crabs (Eriocheir sinensis</i>), wire weed (<i>Sargassum Keylela clava</i>) (Eno <i>et al.</i>, 1997; GB Non-Native Species Science)



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

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

ent by shipping vessels either ts and Hasting, 2011; Lozano and imately 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)

hrough the release of individuals of INIS release of ballast water (Ware, 2009), ed (IMO, 2012; Davidson *et al.*, 2010), or le 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 avigation, ports and flood protection

the Marine Cable Corridor, such as the costrea (Magallana) gigas), Chinese in muticum), and the leathery sea squirt is Secretariat, 2019).

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SAC	Effect	Feature	LSE?	Justification
				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
		Reefs [1170]	Ν	Therefore, it is concluded that there is no potential for LSE
	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 N
	sediments	Reefs [1170]	N	significantly elevated levels of contaminants with no record Cefas Action Level 2. In addition, for all contaminants othe 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 pa Evidence from the nearby IFA2 interconnector and Rampi the wider area is not heavily contaminated despite the lon- military activity in the area.
				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 concluded that ther
	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 f
		Reefs [1170]	Ν	
	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 th detail on the predicted hydrodynamic changes resulting fro
		Reefs [1170]	Ν	found in Chapter 6 Physical Processes.



- 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 her 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
- vithin the Marine Cable Corridor contaminants being re-released into the ere is no potential for LSE.
- Cable Corridor and as such no effects I for LSE.
- es, from installation of rock protection, through installation operations. More from the Proposed Development can be

SAC	Effect	Feature	LSE?	Justification
				The Physical Processes assessment concluded that any small, highly localised and temporary resulting from near elevated turbulence intensities as a result of the work. The Proposed Development is over 3 km from the boundar predicted that that any effects due to any hydrodynamic c
				is concluded that there is no potential for LSE.
	Noise and Vibration	Reefs [1170]	Ν	Vessel movement is an important source of underwater in Activities resulting in vibration include trenching for cable Enterprise and Regulatory Reform (BERR), 2008; Robins (Robinson <i>et al.</i> , 2011). This pressure is only relevant to b 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 b (Nedwell <i>et al.</i> , 2003). Therefore, it is concluded that the



y hydrodynamic changes will be very ar bed flow velocities and slightly

ndary of the SAC, and it is therefore c changes are negligible, and therefore it

noise (OSPAR Commission, 2009). le laying (Department for Business nson *et al.*, 2011), and dredging o birds and sea mammals that spend not relevant to most benthic habitats, es can perceive noise and vibration (e.g. vill be of low magnitude (OSPAR, 2009) d beyond the Marine Cable Corridor nere is no potential for LSE.

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7.2.2. ANNEX II DIADROMOUS MIGRATORY FISH

<u>Salmon</u>

- 7.2.2.1. Salmon are an interest feature of a number of SACs/Ramsar where connectivity may exist with the potential effects identified for the Proposed Development. All sites within the study area which list salmon as qualifying features are listed below:
 - River Itchen SAC;
 - River Avon SAC;
 - Estuaire de la Seine SAC/Marias Vernier Ramsar;
 - · Baie de Canche et Couloir des trois Estuaires SAC; and
 - Baie de Seine Orientale SAC.
- 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 decommissioning), 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/Ramsar	Effect	Assessment	Potential for LSE? Y/N
River Itchen River Avon Estuaire de la Seine SAC/Marais Vernier Ramsar	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. 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. LSE cannot be fully ruled out for this impact and it will be progressed to AA stage for the River Itchen 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 Estuaire de la Seine SAC/Marais Vernier Ramsar, Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale SACs.	Y (UK sites only)
Baie de Canche et Couloir des trois Baie de Seine Orientale	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 indicates it is not an area of interest or concern. 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 concluded that the impact will not lead to LSE on the River Itchen, River Avon, Estuaire de la Seine SAC/Marais Vernier Ramsar, Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale.	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 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. 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 concluded 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, Estuaire de la Seine SAC/Marais Vernier Ramsar, Baie de Canche et Couloir des trois Estuaires SAC and Baie de Seine Orientale SAC.	Ν
	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. LSE cannot be fully ruled out for this impact and it will be progressed to AA stage.	Y

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



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SAC/ZSC/Ramsar	Effect	Assessment	Potential for LSE? Y/N
		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.	
	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 <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).	
		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 riverbed. 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 417.4 m 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.	
		Given salmon's low sensitivity to underwater noise and vibration, construction (operation and decommissioning) these are not considered to result in any significant barrier effects.	
		As 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 concluded that this impact as a result of the Proposed Development alone, will not lead to LSE on the River Itchen SAC, River Avon SAC, Estuaire de la Seine SAC/Marais Vernier Ramsar, Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale SACs.	
	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).	



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



SAC/ZSC/Ramsar	Effect	Assessment
River Itchen	EMF	The potential impact of EMF could occur as a result of the operation of the HVDC interconnector cables. The pressure f strength for EMF around the cables is 42 μ T at 1 m depth, with the proposed minimum burial depth for the cable
River Avon Estuaire de la		Adult salmon although generally surface dwelling are known to pass through a range of water depths whilst at s <i>a</i> l., 2014); this is also true for smolts which swim close to the surface although they have been observed to make changes in swimming depths (Westerberg, 1982; Reddin <i>et al.</i> , 2006). Given their propensity to dive both adult s smolts may be exposed to EMF produced by the operational cables installed as part of the Proposed Development
Seine SAC/Marais Vernier Ramsar Baie de Canche et Couloir des trois		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 μ T. This magnetic field double than that predicted for the Proposed Development (42 μ T) 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 any impact will be of she transiting across the cables.
Baie de Seine Orientale		In light of the above evidence it is concluded the effects from EMF as a result of the operation of the Proposed E alone, will not lead to a LSE on the Salmon from the River Itchen SAC, River Avon SAC, Estuaire de la Seine SA Vernier Ramsar, Baie de Canche et Couloir des trois 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 seabed surface. Information presented within the ES Addendum potential heat emissions from the Marine Cables support the findings from other studies (document reference 7. for the Proposed Development will be buried to a target burial depth of 1 m, and the thermal assessment desom substantial temperature increase will not be detectable at the seabed. In addition, salmon (and smolts) generally the sea surface so interaction with any temperature increasesfrom the Proposed Development is unlikely.
		Given the minimal emission of heat which is expected to have little to no effect on salmon this impact will not lea River Itchen, River Avon, Estuaire de la Seine SAC/Marais Vernier Ramsar, Baie de Canche et Couloir des trois 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.	Ν
sea (Godfrey <i>et</i> ke regular rapid t salmon and ment.	
he results showed eld is more than iddition, the sea ear the seabed hort duration while	
SAC/Marais	
t is expected that	Ν
Nemo link HVDC only be 1.2°C at m regarding 7.8.1). The cables mnstrates that any lly swim near to	
ead to LSE on the is Estuaires and	

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 three French SACs and a Ramsar. 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);
 - Estuaire de la Seine SAC/Marais Vernier Ramsar (twaite 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 decommissioning), 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/Ramsar	Effect	Assessment	Potential for LSE? Y/N
Allis shad: Plymouth Sound and Estuaries SAC Baie de Canche et Couloir des trois Estuaires SAC Baie de Seine Orientale SAC Twaite shad: Baie de Seine Orientale SAC Estuaire de la Seine SAC/Marais Vernier Ramsar	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 dredged 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 ⁻¹ 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 ⁻¹ , 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 an impacted area. In addition, both shad species spawn in a riverine environment so will be inherently tolerant of	N
Ramsar Littoral Cauchois SAC	Physical injury	naturally high and variable background levels of suspended. Both allis and twaite shad are most likely to navigate around or 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 temporary nature (reducing to background levels in minutes to days) of this effect, no barrier to allis and twaite shad migration is expected. It is concluded therefore that the increase in SSC from construction 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, Estuaire de la Seine SAC/Marais Vernier Ramsar and Littoral Cauchois SAC.	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), 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 concluded 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, Estuaire de la Seine SAC/Marais Vernier Ramsar and Littoral Cauchois SAC.	IN
	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 trout (<i>Oncorhynchus mykiss</i>) which have escaped from fish farms can be an issue in allis and twaite shad rivers, however	Ν

Table 7.4 - LSE Assessment for Allis Shad and Twaite Shad during Construction and Decommissioning of the Proposed Development alone



WSP/Natural Power

SAC/ZSC/Ramsar	Effect	Assessment	Potential for LSE? Y/N
		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 allis and twaite shad. It is concluded therefore that the potential introduction of non-native species 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, Estuaire de la Seine SAC/Marais Vernier Ramsar 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 seabed, 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, Estuaire de la Seine SAC/Marais Vernier Ramsar and Littoral Cauchois SAC.	



SAC/ZSC/Ramsar	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 seabed (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 from visual disturbance 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, Estuarie de la Seine SAC/Marais Vernier Ramsar and Littoral Cauchois SAC.	



SAC/ZSC/Ramsar	Effect	Assessment	Potential for LSE? Y/N
 Allis Shad: Plymouth Sound and Estuaries SAC Baie de Canche et Couloir des trois Estuaires SAC Baie de Seine Orientale SAC Twaite Shad: Baie de Seine Orientale SAC Estuaire de la Seine SAC/Marais Vernier Ramsar 	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 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 potential impact of EMF 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, Estuaire de la Seine SAC/Marais Vernier Ramsar and Littoral Cauchois SAC.	Ν
Littoral Cauchois SAC	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 seabed surface. Information presented within the ES Addendum regarding potential heat emissions from the UK Marine Cables support the findings from other studies (document reference 7.8.1). The cables for the Proposed Development will be buried to a minimum depth of 1 m and the thermal assessment deomnstrates that any substantial temperature increase will not be detectable at the seabed. In addition, allis and twaite shad generally swim near to the sea surface so interaction with any heat emissions 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, Estuaire de la Seine SAC 	Ν

Table 7.5 - LSE Assessment for allis and twaite shad during Operation (including Repair and Maintenance)



WSP/Natural Power



Sea Lamprey and River 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 and a Ramsar where connectivity may exist with the potential effects identified for the Proposed Development. All sites within the study area which list sea lamprey and/or river lamprey as qualifying features are listed below:
 - River Avon SAC (sea lamprey);
 - River Axe SAC (sea lamprey);
 - Littoral Cauchois SAC (sea lamprey and river lamprey);
 - Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC (river lamprey);
 - Estuaire de la Seine SAC/Marais Vernier Ramsar (sea lamprey and river lamprey);
 - Baie de Canche et Couloir des trois Estuaires SAC (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;
 - EMF; and
 - Temperature changes.
- 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 decommissioning), 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.

Table 7.6 - LS	E Assessment for S	ea lamprey and Rive	er lamprey during	Construction and Decom	missioning
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SAC/ZSC/Ramsar	Effect	Assessment	Potential for LSE? Y/N
Sea Lamprey: River Avon SAC River Axe SAC		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. Lamprey are known to use the coastal waters and there is the possibility that an increase in SSC	Y (UK sites only)
Littoral Cauchois SAC Estuaire de la Seine SAC/Marais Vernier Ramsar Baie de Canche et Couloir des trois Estuaires SAC		could pose a barrier to their migration or cause respiratory effects from depleted oxygen. As LSE cannot be fully ruled for the River Axe and River Avon, this impact will be progressed to AA stage. Due to the distance between the French sites, it is not considered that increases in SSC will result in any significant effect on the qualifying features e.g. barrier effects.	
Estuaires SAC Baie de Seine Orientale SAC River Lamprey: Littoral Cauchois SAC Estuaire de la Seine SAC/Marais Vernier Ramsar Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC	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 lamprey. It is considered however that given lampreys (both adult and transformers) are highly mobile and therefore have the innate ability to avoid areas of increased vessel traffic the possibility of this impact is extremely low. Although a potential route to impact exists this will not lead to LSE on the River Avon SAC, River Axe SAC, Littoral Cauchois SAC, Estuaire de la Seine SAC/Marais Vernier Ramsar, Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC, Baie de Canche et Couloir des trois Estuaires SAC and Baie de Seine Orientale SAC.	Ν
Baie de Canche et Couloir des trois Estuaires SAC Baie de Seine Orientale SAC	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 both sea and river lamprey. The introduction of non-native migratory fish species has the potential to increase competition for spawning grounds with domestic lamprey stocks and potentially reduce recruitment. In addition, the introduction of non-native parasites could also have negative effects on lamprey stocks. There is no publicly available literature on vessel born non-native species which are specifically harmful to lamprey. In addition, only a few parasites have been recorded from lampreys and nothing is known about their effect (Maitland, 2003). 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 sea and river lamprey. It is concluded therefore that the potential introduction of non-native species will not lead to LSE River Avon SAC, River Axe SAC, Littoral Cauchois SAC, Estuaire de la Seine SAC/Marais Vernier Ramsar, Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC, Baie de Canche et Couloir des trois Estuaires SAC and Baie de Seine Orientale SAC.	Ν



SAC/ZSC/Ramsar	Effect	Assessment	Potential for LSE? Y/N
	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 lamprey (and transformers) whilst they are migrating to or from freshwater. As LSE cannot be fully ruled out this effect will be progressed to AA stage. Historic pollution in the form 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. 	Y
	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). 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 and it is concluded that this impact will not lead to LSE on the river Avon, river Axe, Littoral Cauchois, Estuaire de la Seine SAC/Marais Vernier Ramsar, Estuaires et Littoral Picards (Baies de Somme et d'Authie), Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale SAC.	Ν



SAC/ZSC/Ramsar	Effect	Assessment	Potential for LSE? Y/N
Sea Lamprey: River Avon River Axe Littoral Cauchois Estuaire de la Seine SAC/Marais Vernier Ramsar Baie de Canche et Couloir des trois Estuaires Baie de Seine Orientale River Lamprey: Littoral Cauchois Estuaire de la Seine SAC/Marais Vernier Ramsar Estuaires et Littoral Picards (Baies de Somme et d'Authie) 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 μ 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 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. 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 concluded that EMF as a result of the Proposed Development will not lead to LSE on the River Avon, River Axe, Littoral Cauchois, Estuaire de la Seine SAC/Marais Vernier Ramsar, Estuaires et Littoral Picards (Baies de Somme et d'Authie), Baie de Canche et Couloir des trois Estuaires and Baie de Seine Orientale ZSC/SACs.	Ν
	Temperature changes	Heat is generated as electricity passes 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. The effect of heat from subsea cables on lamprey is not well documented however 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 seabed surface. Information presented within the ES Addendum regarding potential heat emissions from the Marine Cables supports the findings from these studies (document reference 7.8.1). The cables for the Proposed Development will be buried to a target burial depth of 1 m, and the thermal assessment demonstrates that any substantial temperature increase will not be detectable at the seabed. In addition, lamprey are highly mobile and not dependent on the	Ν

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



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SAC/ZSC/Ramsar	Effect	Assessment
		seabed so interaction with any heat, from the Proposed Development is unlikely.
		Given the minimal emissions of heat from the Marine Cables whis expected to have little to no effect on lamprey this impact will read to LSE on the River Avon, River Axe, Littoral Cauchois, Estuaire de la Seine SAC/Marais Vernier Ramsar, Baie de Cancet Couloir des trois Estuaires, Baie de Seine Orientale and Estuaires et Littoral Picards (Baies de Somme et d'Authie) SACs



	Potential for LSE? Y/N
which ill not	
inche	
Cs.	



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



d positioning equipment: survey and positioning equipment has anent threshold shift ('PTS'), i.e. auditory) if source levels are high (National ('NOAA') (2018) PTS onset thresholds he 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

ble 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

se only): ured during HDD work (Nedwell et al., e 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:

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Effect	Species	Relevant SACs/ZSC/Ramsar	LSE?	Justification	
		Baie de Seine orientale SAC		The sound emitted by some geophysical su	
	Harbour porpoise	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	Ν	the potential to disturb marine mammals if within their hearing range. Although there small number of individuals, any effects ar reversible (animals are likely to return to a documented by Thompson <i>et al.</i> , 2013) wi being available in the meantime. Given the the vicinity of the Proposed Development,	
	Grey seal		Ν	potential for significant disturbance. <u>Noise from seabed preparation work, cab</u> Disturbance ranges as a result of increase activities and vessels proposed are likely Natural Power, 2018). There is therefore r disturbance as a result of noise from the p Furthermore, any effects are likely to be to	
	Harbour seal	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	N	alternative local habitat being available in the Noise from HDD work (construction phase of noise measured during HDD work (Nedwell be negligible potential for disturbance. <u>Noise from potential vibro-hammering and seconstruction phase only</u>): Due to the low levels of noise emitted by type 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 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</u> 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). Therefore, no LSE as a result of disturbate of proposed Development alone.	



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

le 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 ell *et al*., 2012), there is considered to

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 cant disturbance as a result of the

<u>etion phase only</u>): The potential for ns within these seven sites in response etween the Proposed Development and

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

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Effect Species		Relevant SACs/ZSC/Ramsar	LSE?	Justification	
Collision	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) SAC Littoral Cauchois SAC Baie de Seine orientale SAC	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 SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	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. Therefore their path and avoid them, which will great	
	Grey seal	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	Ν	addition, any animals present will already vessel movements present in the study an movements/day in summer and 300 vess Chapter 13 Shipping, Navigation and Oth APP-128). Therefore, the potential for sig is considered to be negligible. Therefore, no LSE as a result of collisi	
	Harbour seal	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	Ν	dolphin, harbour porpoise, grey seal and Proposed Development alone.	
Indirect effects	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) SAC Littoral Cauchois SAC Baie de Seine orientale SAC	Ν	Indirect effects such as changes in suspective construction (operation and decommission activities (such as dredging/MFE) have the subscripts of the subscri	
	Harbour porpoise	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	availability/quality and alter marine mamma therefore fitness. However, marine mammals are recorded for suspension levels are high, such as estuard for foraging (Bailey and Thompson, 2010). visual cues to hunt (they use echolocation)		
	Grey seal	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	Ν	hydrodynamic stimuli through their whis and sound (Dehnhardt <i>et al.</i> , 1998; 200 will continue to forage in areas of high s other than visual ones. It is also predicte Proposed Development will reduce dow so any potential effects would only be s	



ality and physical injury (with potential nals, particularly large whales. The red 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 ty 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, nficant effects resulting from collisions

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

ended sediment levels as a result of ning) including seabed preparation ne 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.

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Effect	Species	Relevant SACs/ZSC/Ramsar	LSE?	Justification		
	Harbour seal	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	N	Furthermore, because marine mammals ra habitats, 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 an Proposed Development alone.		
Pollution	Bottlenose dolphin	Estuaires et littoral picards (baies de Somme et d'Authie) SAC Littoral Cauchois SAC Baie de Seine orientale SAC	Y	Potential pollution as a result of the Propo broad types: Contamination as a result of disposal of litter.		
	Harbour porpoise	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	Y	Pollution may have short-term/direct effect is affected as a result of an unplanned spi (Kastelein and Lavaleije, 1992) or animals (Baulch and Perry, 2014). Pollution may also have long-term/indirect		
	Grey seal	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	Y	 contaminated prey items are ingested. Bee apex predators, bioaccumulation as a resulter items may occur (Wells <i>et al.</i>, 2005). This reduced reproductive success. Historic pollution in the form of contaminate and organo-metals) is not considered to here resuspension of sediments, to a LSE as the contaminated. The potential for pollution to result in a porpoise, grey seal and harbour seal as Development alone cannot be ruled out taken through to the next stage of the approximate. 		
	Harbour seal	Récifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Baie de Canche et couloir des trois estuaires SAC Estuaires et littoral picards (baies de Somme et d'Authie) SAC/Baie de Somme Ramsar Littoral Cauchois SAC Baie de Seine orientale SAC Estuaire de la Seine SAC	Y			



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

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

bsed Development may be split into two unplanned 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

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

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

a LSE on bottlenose dolphin, harbour as a result of the Proposed ut and therefore pollution has been 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 SPA	A 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 visual disturbance and unpredictable noise events, particular 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 to and associated activities during all phases of development a
		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 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 result low, common terns will habituate to the increased presence during all phases of development and LSE can be ruled out.
		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 inco considered to be of limited spatial extent and short lived (red and LSE can be ruled out
		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 sea se 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 marine 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 SPA through both arly in relation to HDD works during

itivity to disturbance from vessel traffic ry 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 and LSE can be ruled out.

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 to the existing vessel activity in the area. Ilting from the Proposed Development is e of vessels and associated activities ıt..

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 ncreases in suspended sediment are duce to background levels within days)

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

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

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				Increases in suspended sediment as a result of seabed prepactivities and cable maintenance within this SPA 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 are sensitive to habitat disturbance and therefore to potential effected 2014). Increases in suspended sediment as a result of seable burial activities and cable maintenance within this SPA may species' foraging range (Wilson <i>et al.</i> , 2014).
		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	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- ruled out.
		Sandwich 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 can be ruled out.
		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 can be ruled out.
	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 activities associated with the Propo invasive non-indigenous predators (e.g. mink) to common te vessels will not be berthed in Chichester and Langstone Har
		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



eparation, HDD works, cable burial ct 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 by affect prey availability within this

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

above water collision risk to little terns ace feeding species including terns are ⁻urness *et al*., 2012) and LSE can be

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

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

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

osed Development to introduce invasive eding colonies, since installation vessels

bosed Development to introduce tern breeding colonies, since installation arbours.

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

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				herring and sprats which are highly mobile, these species w in prey communities and LSE can be ruled out.
	Accidental spills	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 surravailability.
	Litter	Little tern	Y	Unplanned disposal of industrial or user plastic during all de directly affect little terns when utilising the sea surface throu 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 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.
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 dist 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



will not be affected by localised changes

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

levelopment phases has the potential to bugh ingestion or entanglement resulting

levelopment phases has the potential to ce through ingestion or entanglement

levelopment 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 his 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 be species' restricted foraging range and associated activities during all oured foraging habitat within this SPA

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				through both visual disturbance and unpredictable noise eve works 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 Chichester and Langstone Harbor England, 2016; Natural England, 2019a). It is therefore consist habituate to the increased presence of vessels and associated development and LSE can be ruled out.
		Common tern	N	Foraging common terns are considered to be of low sensitivity and associated activities (Garthe & Hüppop, 2004; Bradbury are known to forage within Chichester and Langstone Harbor England, 2016; Natural England, 2019a). It is therefore const habituate to the increased presence of vessels and associated development and LSE can be ruled out.
		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 o maintenance vessels and LSE can be ruled out.
	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 comoderately sensitive to habitat disturbance and subsequent <i>al.</i> , 2014). Increases in suspended sediment as a result of seburial activities and cable maintenance may affect prey available within Langstone and Chichester Harbours.
		Little tern	Y	Little terns are visual foragers and are likely to be affected by make it harder to see prey from the sea surface. They are con- habitat disturbance and therefore potential effects on prey (B suspended sediment within Langstone Harbour as a result of addition to cable burial and maintenance activities outwith La availability within this species' restricted foraging range (Pars
		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 ar sensitive to habitat disturbance and therefore potential effect Increases in suspended sediment within Langstone Harbour HDD works, in addition to cable burial and maintenance activ affect prey availability within this species' foraging range (Wi
		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 are



ents, particularly in relation to HDD

tivity to disturbance from vessel traffic ry *et al.*, 2014). Indeed, Sandwich terns ours (Wilson *et al.*, 2014; Natural usidered that Sandwich terns will ated activities during all phases of

vity to disturbance from vessel traffic ry *et al.*, 2014). Indeed, common terns ours (Wilson *et al.*, 2014; Natural isidered that common terns will ated activities during all phases of

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

y to be affected by an increase in column. They are considered to be it 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 of seabed preparation, HDD works, in Langstone Harbour, may affect prey arsons *et al.*, 2015).

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

cted by an increase in turbidity which are considered to be moderately

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				sensitive to habitat disturbance and therefore potential effect Increases in suspended sediment within Langstone Harbour HDD works, in addition to cable burial and maintenance activ 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 phytopl 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 LSE can be ruled out.
		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 col
		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	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



ects on prey (Bradbury *et al*., 2014). ur as a result of seabed preparation, ctivities outwith Langstone Harbour, may *N*ilson *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 ed on Furness *et al.*, (2012), it is likely below water collisions. Structures or sed Development will only be used in red-breasted mergansers will avoid

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 Id Langstone Harbours.

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

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				herring and sprats which are highly mobile, species will not prey communities and LSE can be ruled out.
	Accidental spills	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 condirect oiling resulting in mortality.
	Litter	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 throu 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 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.
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 consider 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



ot be affected by localised changes in

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

levelopment phases has the potential to bugh ingestion or entanglement resulting

levelopment phases has the potential to ce through ingestion or entanglement

levelopment phases has the potential to e through ingestion or entanglement

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

ortsmouth Harbour between November ered to be of moderate sensitivity to e, 2016). The distance between the listance of 700 m for associated vessel tsmouth Harbour (coastal distance of >5

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
				km) is considered to be such as to ensure no significant dist breasted mergansers utilising this SPA (e.g. Schwemmer <i>et</i>
		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 and LSE can be ruled out.
	Indirect effects	Red-breasted merganser	N	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 are exp return to within comparable background concentrations withis the Proposed Development and favoured foraging and roost (coastal distance of >5 km), it is considered that there is no development phase and LSE can be ruled out.
		Supporting habitat (water column)	N	Increases in suspended sediment as a result of seabed prep activities and cable maintenance are expected to be highly lo availability in the water column at Portsmouth Harbour due to
	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 r vessel operations and therefore the risk of below water collis out.
	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 for However, given that all three tern species predate on a rang herring and sprats which are highly mobile, species will not b prey communities and LSE can be ruled out.
	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.



sturbance or displacement of red*et al*., 2011) and LSE can be ruled out.

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 xpected to be highly localised and to thin days. Given the distance between osting grounds in Portsmouth Harbour o potential for impact during any

eparation, HDD works, cable burial / localised and unlikely to alter prey to distance and LSE can be ruled out.

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 and LSE can be ruled

is and Pacific oyster) may be introduced ressels. Invasive species can affect detrimental impacts by outcompeting I food chain (Orlova *et al.,* 2006). Inge of prey species including sandeels, it be affected by localised changes in

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

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
	Litter	Red-breasted merganser	Y	Unplanned disposal of industrial or user plastic during any de directly affect red-breasted mergansers when utilising the se entanglement resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned disposal of industrial or user plastic during all devide directly affect prey species within the water column through mortality.
Solent and Southampton Water SPA/Ramsar site	Disturbance and displacement	Little tern	Ν	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 local Development, it is considered that there is no potential for im- based on the species' restricted foraging range (Parsons <i>et</i> a
		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 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 and LSE can be ruled out.
		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 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 and LSE can be ruled out.
		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 poter 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, 2019d 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 LSE can be ruled out.



development phase has the potential to sea surface through ingestion or

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

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

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

itivity to disturbance from vessel traffic iry *et al.*, 2014). Indeed, Sandwich terns levels are already high (Wilson *et al.*, s 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) and , 2012) and LSE can be ruled out.

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

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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 o maintenance vessels and LSE can be ruled out.
	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) and LSE can be ruled of
		Common tern	Ν	Common terns are visual foragers (Wilson <i>et al.</i> , 2014) and a 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 and LSE ca
		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 fro 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 and LSE can
		Roseate tern	Ν	This feature no longer breeds in this SPA (Piec, 2018), with a 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 poter the distance between this potential breeding site and the Prot the species' foraging range (16.6 \pm 11.6 km; Thaxter <i>et al.</i> , 2
		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- feeding habitat is available elsewhere in the vicinity of the Pr potential for impact and LSE can be ruled out.



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

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

d are likely to be affected by an increase ea surface. They are considered to be at potential effects on prey species ded sediment release across all elative to the species' foraging range oraging habitat elsewhere in the can be ruled out.

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

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) and 2012) and LSE can be ruled out.

affected by an increase in turbidity with all phases of the Proposed g seabed preparation, cable burial, ended material is considered to be of entrations within days. Given the haviour (taking a wide variety of prey England, 2019c), and that alternative Proposed Development there is no

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Supporting habitat (water column)	N	Increases in suspended sediment as a result of seabed prep activities and cable maintenance are expected to be highly lo availability in the water column at Portsmouth Harbour due to
	Collision	Little tern	Ν	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	Ν	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
		Sandwich 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
		Roseate tern	N	This feature no longer breeds in this SPA (Piec, 2018), with Southampton Water during the last five years (last recorded or devices which have the potential to pose an above water be introduced during any development phase. Surface feeding considered to be vulnerable to below water collisions (Furner
		Mediterranean gull	Ν	Structures or devices which have the potential to pose an ab Mediterranean gulls will not be introduced during any develo including gulls are not considered to be vulnerable to below
	INIS	Little tern	Ν	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to the mainlar the Solent and Southampton Waters SPA due to distance.
		Common tern	Ν	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to the mainlar within the Solent and Southampton Waters SPA due to dista
		Sandwich tern	Ν	There is no pathway for offshore works associated with the F invasive non-indigenous predators (e.g. mink) to the mainlar within the Solent and Southampton Waters SPA due to dista
		Roseate tern	Ν	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 mainlar colonies within the Solent and Southampton Waters SPA du



eparation, HDD works, cable burial localised and unlikely to alter prey to distance and LSE can be ruled out.

above water collision risk to little terns face 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 e. Surface feeding species including ollisions (Furness *et al*., 2012).

h only a single individual recorded in ed in 2011; Frost *et al.*, 2018). Structures er collision risk to roseate terns will not ding species including terns are not ness *et al.*, 2012).

above water collision risk to elopment phase. Surface feeding species w 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.

e 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.

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		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 rang herring and sprats which are highly mobile, these species with in prey communities and LSE can be ruled out.
	Accidental spills	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.
		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 devide directly affect little terns when utilising the sea surface throug in mortality.
		Common tern	Y	Unplanned disposal of industrial or user plastic during all devide 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 develocity affect Sandwich terns when utilising the sea surface resulting in mortality.
		Roseate tern	Y	Unplanned disposal of industrial or user plastic during all dev directly affect roseate terns when utilising the sea surface th resulting in mortality.



s and Pacific oyster) may be introduced essels. Invasive species can affect letrimental impacts by outcompeting food chain (Orlova *et al.,* 2006). age of prey species including sandeels, will not be affected by localised changes

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

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

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

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

ur during all development phases. Spills ien 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 through ingestion or entanglement

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Mediterranean gull	Y	Unplanned disposal of industrial or user plastic during all develocity affect Mediterranean gulls when utilising the sea surf entanglement resulting in mortality.
		Supporting habitat (water column)	Y	Unplanned disposal of industrial or user plastic during all devide 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 and LSE can be
		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 and LSE can be ruled out.
	Indirect effects	Common tern	Ν	Common 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). However, any impact is considered to be highly local range across all development phases, with equivalent foragi vicinity of the Proposed Development and LSE can be ruled
		Supporting habitat (water column)	Ν	Increases in suspended sediment as a result of seabed prepactivities and cable maintenance are expected to be highly lo availability in the water column at Portsmouth Harbour due to
	Collision	Common tern	Ν	Structures or devices which have the potential to pose an ab terns will not be introduced during any development phase. S terns are not considered to be vulnerable to below water coll
INIS	INIS	Common tern	Ν	There is no pathway for offshore works associated with the F invasive 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 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 herring and sprats which are highly mobile, species will not b prey communities and LSE can be ruled out.	



levelopment phases has the potential to urface through ingestion or

levelopment phases has the potential to hingestion or entanglement resulting in

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

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

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 iging habitat elsewhere in the immediate ed out.

eparation, HDD works, cable burial localised and unlikely to alter prey to distance and LSE can be ruled out.

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

e Proposed Development to introduce and common tern breeding colony within

is and Pacific oyster) may be introduced ressels. Invasive species can affect detrimental impacts by outcompeting I food chain (Orlova *et al.,* 2006). nge of prey species including sandeels, t be affected by localised changes in

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
	Accidental spills	Common tern	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect common terns when in c 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	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 Developm fulmar and LSE can be ruled out.
		Kittiwake	N	Given their wide-ranging foraging behaviour (Thaxter <i>et al.</i> , from vessel traffic and associated activities (Garthe & Hüpp the distance between the SPA and the Proposed Developm kittiwake and LSE can be ruled out.
		Herring gull	N	Given their wide-ranging foraging behaviour (Thaxter <i>et al.</i> , from vessel traffic and associated activities (Garthe & Hüpp the distance between the SPA and the Proposed Developm herring gull and LSE can be ruled out.
		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 Developm great black-backed gull and LSE can be ruled out.
	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 there and LSE can be ruled out.
		Kittiwake	Ν	Given their wide-ranging, pelagic foraging behaviour (Thaxto 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 there and LSE can be ruled out.



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

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

levelopment phases has the potential to through ingestion or entanglement

levelopment phases has the potential to hingestion or entanglement resulting in

., 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

., 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 re is no potential for impact on fulmar

xter *et al*; 2012; Ponchon *et al*., 2015), radbury *et al*., 2014), and reliance on short-term, temporary and localised e is no potential for impact to kittiwake

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Herring gull	N	Herring gulls utilise terrestrial, intertidal and marine habitats prey species including invertebrates, small fish and carrion (in plasticity shown by herring gulls in their foraging behaviour (in term, temporary and localised effect of sediment release on potential for impact to this feature and LSE can be ruled out.
	Collision	Great black-backed gull	Ν	Given their wide-ranging, pelagic foraging behaviour (Thaxter traffic (Garthe & Hüppop, 2004; Bradbury <i>et al.</i> , 2014), and p short-term, temporary and localised effect of sediment release no potential for impact to this feature and LSE can be ruled of
		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	Ν	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. Surface 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 including gulls are not considered to be vulnerable to below
	INIS	Fulmar	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.
		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	Ν	There is no pathway for marine works associated with the Pr 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.



s for foraging, taking a wide variety of (including fishery discards). Given the (Natural England, 2019d), the shortn benthic prey availability there is no t.

ter *et al*; 2012), low sensitivity to vessel l plasticity in diet (JNCC, 2016a), the ase on benthic prey availability there is l out.

bove 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 ⁻urness *et al*., 2012).

bove 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

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

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Kittiwake	Y	Unplanned oil or chemical spillages from vessels may occur have the potential to directly affect kittiwakes when in contac oiling resulting in mortality.
		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 throu 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	Ν	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	Ν	Given their wide-ranging foraging behaviour (Wernham <i>et al</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	N	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 there is no potential for impact to thi



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

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

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

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

levelopment phases has the potential to bugh ingestion or entanglement resulting

levelopment phases has the potential to hrough ingestion or entanglement

levelopment phases has the potential to ea surface through ingestion or

., 2012; Wakefield *et al*., 2013; Warwickvessel traffic and associated activities o 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 o potential for impact on lesser black-

kter *et al.*, 2012; Wakefield *et al.*, 2013; schooling fish, squid and fishery calised effect of sediment release on his feature and LSE can be ruled out.

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Storm petrel	N	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 a impact to this feature and LSE can be ruled out.
		Lesser black-backed gull	Ν	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 loc benthic prey availability there is no potential for impact to thi
	Collision	Gannet	Ν	Structures or devices which have the potential to pose an about the introduced during any development phase. Whilst divide considered to be vulnerable to below water collisions (Furner impact is considered to be negligible given the wide-foraging highly localised and temporary area of potential impact from activities and LSE can be ruled out.
		Storm petrel	N	Structures or devices which have the potential to pose an at petrels will not be introduced during any development phase petrels are not considered to be vulnerable to below water c
		Lesser black-backed gull	N	Structures or devices which have the potential to pose an at black-backed gulls will not be introduced during any develop including gulls are not considered to be vulnerable to below
	INIS	Gannet	N	There is no pathway for marine works associated with the P invasive 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 P 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 P 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.



e during the breeding season (Thaxter of from the sea surface. Inshore they are sity in diet, the short-term, temporary and y availability there is no potential for

narine habitats for foraging, taking a fish and carrion (including fishery ed gulls in their foraging behaviour ocalised effect of sediment release on his feature and LSE can be ruled out.

above water collision risk to gannets will living species such as gannets are ness *et al.*, 2012), the potential for ng range of this species compared to the m 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 opment phase. Surface feeding species w water collisions (Furness *et al*., 2012).

Proposed Development to introduce at 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 bosed Development.

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

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

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



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

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

evelopment phases has the potential to through ingestion or entanglement

evelopment 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 disture 2004; Bradbury <i>et al.</i> , 2014) although their sensitivity to disturbance from tern colonies exist within both Chichester and Langstone Harbours, specidid not locate any breeding individuals or indeed foraging flights as detaid 420). Therefore, little terns are not expected to be exposed to disturbance the Proposed Development.
		Sandwich tern	Ν	Foraging Sandwich terns are considered to be of low sensitivity to distur- 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 to Report (APP-420). Therefore, Sandwich terns are not expected to be ex- effects from any phase of the Proposed Development.
		Common tern	Ν	Foraging common 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. Common terns are known to breed and forage with (Wilson <i>et al.</i> , 2014; Natural England, 2016; Natural England, 2019a. Sp did not locate any breeding individuals or indeed foraging flights as detaid 420). Therefore, common terns are not expected to be exposed to distur- phase of the Proposed 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 de an estuary close to conurbations (Goss-Custard <i>et al.</i> , 2019). Onshore we considered to result in any light spillage into the SPA.Dark-bellied brent of considered highly sensitive to disturbance effects (Cutts <i>et al.</i> , 2013). Sp the onshore element of the Proposed Development recording recorded of dark-bellied brent geese were also recorded utilising multiple identified to Wintering Bird Survey Report (APP-421). Therefore, noise and visual im decommissioning works from onshore elements of the Proposed Develop feature and possible temporary displacement.
		Pintail Shoveler Teal Wigeon Bar-tailed godwit Black-tailed godwit Curlew	Y	Visual disturbance is considered to be of a limited magnitude as a result an urban setting and recent research has established that disturbance de an estuary close to conurbations (Goss-Custard <i>et al.</i> , 2019). Onshore we considered to result in any light spillage into the SPA. Pintail, shoveler, the <i>al.</i> (2013); mallard and therefore proxy species are considered to determ dabbling duck with similar ecological niche to shoveler, wigeon and pinta however. It is therefore assumed for the purposes of this assessment that moderately sensitive to disturbance effects. Curlew, grey plover and bar- moderately sensitive to disturbance (Cutts <i>et al.</i> , 2013 – where the finding

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

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urbance from vessel traffic (Garthe & Hüppop, om onshore activities is uncertain. While little ecific surveys for the Proposed Development ailed in the Breeding Bird Survey Report (APPnce and displacement effects from any phase of

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 as detailed in the Breeding Bird Survey exposed to disturbance and displacement

bance from vessel traffic and associated r sensitivity to disturbance from onshore within both Chichester and Langstone Harbours Specific surveys for the Proposed Development vailed in the Breeding Bird Survey Report (APPurbance and displacement effects from any

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 t goose, redshank and shelduck are however Specific surveys of intertidal habitat adjacent to Leach of these species in abundance while terrestrial strategy sites as detailed in the mpacts from both construction and lopment 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 teal and wigeon were not included in Cutts *et.* <u>ermine their sensitivity to disturbance. Mallard (a</u> tail) is considered to be moderately sensitive that these four species of wildfowl are <u>also</u> ar-tailed godwit are also deemed to be lings relating to black-tailed godwit are taken

WSP/Natural Power

Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Grey plover		here as proxy for bar-tailed). All these species were recorded in varying is onshore works of the Proposed Development as detailed in the Wintering noise <u>and visual impacts</u> from <u>both</u> construction and decommissioning with Development could result in disturbance of the feature and possible temp
		Turnstone Sanderling Ringed plover Dunlin	Ν	Visual disturbance is considered to be of a limited magnitude as a result an urban setting and recent research has established that disturbance de an estuary close to conurbations (Goss-Custard <i>et al.</i> , 2019). Cutts <i>et al.</i> ringed plover and dunlin are of low sensitivity to disturbance. Although al intertidal habitat adjacent to onshore works of the Proposed Developmen Report (APP-421) these species are considered to be extremely tolerant Proposed Development and are likely to rapidly habituate.
		Waterfowl assemblage	Y	The cited waterfowl assemblage for the SPA includes contributions from sensitive to disturbance. Therefore, noise <u>and visual effects</u> from constru- onshore elements of the Proposed Development could result in disturbant temporary displacement.
		Supporting habitat (freshwater and coastal grazing marsh)	Ν	Disturbance and displacement of supporting habitat relevant to onshore marsh) is considered to be negligible since it is considered that the habit
	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 Waterfowl assemblage	Ν	Wading and wildfowl species are not expected to be affected by any cha sediment as a result of HDD works, cable burial activities and cable mair 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 However, given the distance between the Proposed Development and fa terns species, it is considered that there is no potential for impact during



g numbers in intertidal areas adjacent to the ing Bird Survey Report (APP-421). Therefore, works from onshore elements of the Proposed mporary displacement.

It of the Proposed Development. The SPA is in does not have a significant impact on waders in I. (2013) determines that turnstone, sanderling, all these species were found to be present in ent as detailed in the Wintering Bird Survey nt of any disturbance mechanisms from the

m species that are highly or moderately ruction and decommissioning works from ance of the assemblage and possible

e ecology (freshwater and coastal grazing itats present are not sensitive to vibration. -

anges to prey species. Increases in suspended intenance is expected to be highly localised s. Terns are visual foragers and are likely to be y in the water column. They are considered to al effects on prey (Bradbury *et al.*, 2014). favoured foraging and breeding grounds of g any development phase.

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Supporting habitat (freshwater and coastal grazing marsh)	Y	Onshore works have the potential to result in temporary loss of supportin construction phase.
	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 Waterfowl assemblage	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.
		Supporting habitat (freshwater and coastal grazing marsh)	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	Ν	Wading and wildfowl species are not expected to be affected by any cha suspended sediment as a result of HDD works, cable burial activities and localised and return to within comparable background concentrations wit likely to be affected by an increase in turbidity which can make it harder to considered to be moderately sensitive to habitat disturbance and subseq 2014). Given the distance between the Proposed Development and favo species, it is considered that there is no potential for impact during any d



ting / functionally linked habitat during the

ur during construction and decommissioning. tact supporting habitat through direct oiling

ur during construction and decommissioning. species resulting in mortality.

nanges in water turbidity. Increases in nd cable maintenance is expected to be highly within days. Terns are visual foragers and are er to see prey in the water column. They are equent potential effects on prey (Bradbury *et al.*, youred foraging and breeding grounds of tern development phase.

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Bar-tailed godwit Curlew Shelduck Redshank Waterfowl assemblage		
		Supporting habitat (freshwater and coastal grazing marsh)	Ν	Onshore works are not expected to lead to increases in suspended sedir effects on supporting habitats and prey species are therefore expected.
	INIS	Sandwich tern Little tern Common tern Pintail Wigeon Turnstone Dark-bellied brent goose Dunlin Grey plover Shelduck Redshank Waterfowl assemblage Supporting habitat (freshwater and coastal grazing marsh)	Ν	There is no pathway for onshore construction work activities associated with invasive non-indigenous predators to tern breeding colonies. There is als non-indigenous species affecting other wader and wildfowl species in advised to the species of the species of the species of the species affecting other wader and wildfowl species in advised to the species of the sp
	Litter	Sandwich tern Little tern Common tern Pintail Shoveler Teal Wigeon Turnstone Dark-bellied brent goose Sanderling Dunlin Grey plover	Y	Unplanned disposal of industrial or user plastic during all development pl features and supporting habitat when utilising intertidal habitat through in



diment as a result of onshore works, and no

d with the Proposed Development to introduce also considered to be no pathway of invasive addition to supporting habitat.

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

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
		Ringed plover Bar-tailed godwit Curlew Shelduck Redshank Waterfowl assemblage Supporting habitat (freshwater and coastal grazing marsh)		
Portsmouth Harbour Disturbance and displacement SPA/Ramsar site Disturbance and displacement Indirect effects Indirect effects		Dark-bellied brent goose	Y	Visual disturbance is considered to be of a limited magnitude as a result an urban setting and recent research has established that disturbance de an estuary close to conurbations (Goss-Custard <i>et al.</i> , 2019). Onshore we considered to result in any light spillage into the SPA.Dark-bellied brent of sensitive to disturbance effects (Cutts <i>et al.</i> , 2013). While noise or visual SPA there is considered potential for it to effect functionally linked habitat noise from construction and decommissioning works from onshore element result in disturbance of the feature and possible temporary displacement
		Dunlin Black-tailed godwit Supporting habitat (freshwater and coastal grazing marsh)	Ν	Visual disturbance is considered to be of a limited magnitude as a result an urban setting and recent research has established that disturbance d an estuary close to conurbations (Goss-Custard <i>et al.</i> , 2019). Onshore v considered to result in any light spillage into the SPA. The functionally lin impacted by the Proposed Development was found not to be utilised by goose (as detailed in the Wintering Birds Report APP-421). The SWBGS grassland-, which is unsuitable for wading species such as dunlin and bl displacement of supporting habitat relevant to onshore ecology (freshwa to be negligible since it is considered that the habitats present are not set
	Indirect effects	Dark-bellied brent goose Dunlin Black-tailed godwit	Ν	Given the distance between the Proposed Development and favoured fo SPA, it is considered that there is no pathway for potential impact on qua
		Supporting habitat (freshwater and coastal grazing marsh)	Y	Onshore works have the potential to result in temporary loss during the or (functionally linked SWBGS sites) that is outside of the SPA.



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 it goose, is however is considered highly al disturbance effects impacts will not reach the itat represented by SWBGS sites. Therefore, ments of the Proposed Development could nt.

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 inked habitat of SWBGS sites potentially y any species apart from dark-bellied brent GS sites concerned consist of recreational black-tailed godwit. Disturbance and vater and coastal grazing marsh) is considered

sensitive to vibration.

foraging, breeding and roosting grounds of the ualifying features or supporting habitat.

construction phase of supporting habitat

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Relevant SPA/Ramsar site	Effect	Feature	LSE?	Justification
	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 pathway for potential impact on eith through invasive non-indigenous species.
	Accidental spills	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat	Υ	Unplanned oil or chemical spillages from construction activity may occur Spills have the potential to directly affect all SPA features and supporting through direct oiling resulting in mortality.
	Litter	Dark-bellied brent goose Dunlin Black-tailed godwit Supporting habitat	Y	Unplanned disposal of industrial or user plastic during all development pl features and supporting habitat when utilising intertidal habitat through in



foraging, breeding and roosting grounds of the ither qualifying features or supporting habitat

ur during construction and decommissioning. ng habitat when in contact supporting habitat

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

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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, 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 projects; 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 National Infrastructure 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 tables in Appendix 3 (In Combination Marine Projects, APP-503) 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 May 2020 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 (APP-500) illustrates the locations of all the marine projects considered and listed in the tables in Appendix 3.
- 8.1.1.6. Distances shown in Appendix 3 (Tables 1-4 for marine projects and Table 5 for onshore projects) are approximate and are measured from the closest point of the project or plan as shown on the MMO Marine Information System (where relevant) or planning information to the closest point of the Proposed Development.
- 8.1.1.7. A scoping report for Rampion Offshore Wind Farm Extension (Rampion 2) was submitted to PINS in July 2020. The location of the Rampion 2 project is displayed on Figure 8.1 as Project ID No. 3 (APP-500).
- 8.1.1.8. Since the scoping report has been submitted, the Applicant has undertaken a review of the information contained within the Rampion 2 Scoping Report and has also submitted a consultation response on the report to PINS as a Consultation Body under Regulation 11 of the Infrastructure Planning (EIA) Regulations 2017. In undertaking this review and in providing this response, it is evident that the design and timescales of Rampion 2 remain very much in the early stages and the information within the scoping report is not sufficient for a meaningful assessment to be undertaken.
- 8.1.1.9. Assessments are undertaken using the PINS screening matrices presented in Appendix 1 and Appendix 5 (APP-501, Rev 002 and 7.7.10) which present assessment of likely effects on European marine site and Ramsar 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.

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8.2.2. ANNEX II DIADROMOUS 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 and Appendix 5). 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 and Ramsars 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.

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- 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/Ramsar can be concluded.
- 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).
- 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 Marine and Ramsar 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 and Appendix 5 PINS matrices for further details).

8.3. ONSHORE ENVIRONMENT

- 8.3.1.1. The list of plans/projects which could act in-combination with the Proposed Development on onshore ecological features is based on the list in Table 5 of Appendix 3.
- 8.3.1.2. For those European sites and features where no LSE could not be concluded for the Proposed Development alone (see Section 7.3 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 and Ramsar 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 and Appendix 5 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 Marine and Ramsar 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 DIADROMOUS 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 SPA	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

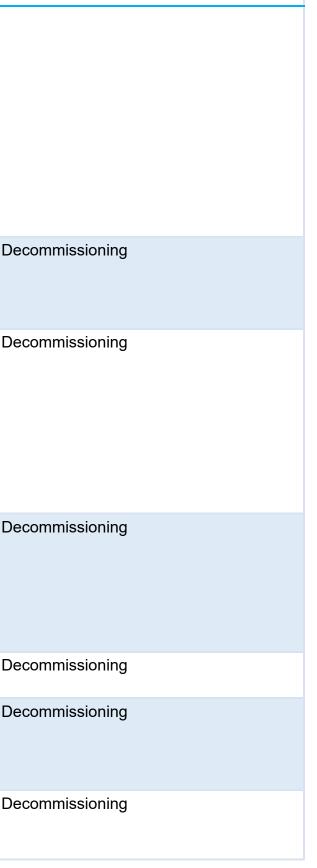
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European site	Feature	Effect	Project phase/s
	Common tern	Accidental spills	
		Litter	
	Sandwich tern	Accidental spills	
		Litter	
	Roseate tern	Accidental spills	
		Litter	
	Mediterranean gull	Accidental spills	
		Litter	
	Supporting habitat (water 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, Operation and De
		Pollution Events	
River Avon SAC	Salmon	Increased SSC	Construction, Operation and De
		Pollution events	
	Sea lamprey	Increased SSC	
		Pollution Events	
Littoral Cauchois SAC	Bottlenose Dolphin	Pollution	Construction, Operation and De
	Harbour Porpoise	Pollution	
	Grey Seal	Pollution	



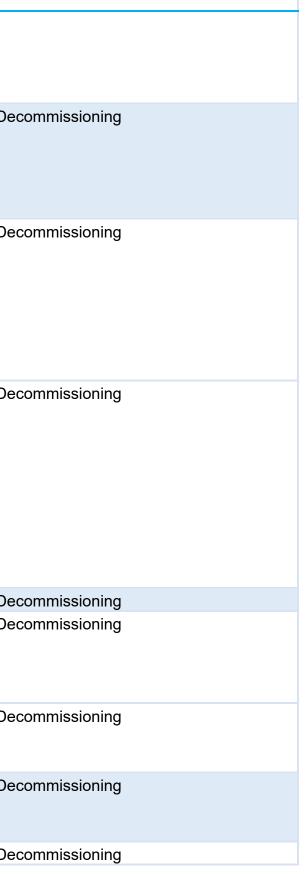


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European site	Feature	Effect	Project phase/s
	Harbour Seal	Pollution	
	Twaite shad	Pollution Events	
	Sea lamprey	Pollution Events	
	River lamprey	Pollution Events	
Estuaires et Littoral Picards (Baies de Somme et d'Authie)	Bottlenose Dolphin	Pollution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





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European site	Feature	Effect	Project phase/s
	Grey Seal	Pollution	
	Harbour Seal	Pollution	
Plymouth Sound and Estuaries SAC	Allis shad	Pollution Events	Construction, Operation and De
Solent Maritime SAC	Estuaries [1130]	Increased SSC	Construction, Operation and Dec
	Sandbanks (slightly covered by seawater all the time) [1110]	Deposition of Sediment (Smothering)	
	Mudflats and sandflats (not submerged at low tide) [1140]	Pollution Invasive Species	
	Spartina swards [1320]		
	Atlantic salt meadows [1330]		
	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

Decommissioning

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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 alone and in combination with other plans and projects

European site	Feature	Effect	Project phase/s
Chichester and Langstone Harbours SPA/Ramsar	Sandwich tern	Accidental spills	Construction,Operation and E
		Litter	Construction,Operation and E
	Common tern	Accidental spills	Construction,Operation and I
		Litter	Construction,Operation and I
	Little tern	Accidental spills	Construction,Operation and I
		Litter	Construction,Operation and I
	Dark-bellied brent goose	Disturbance and displacement (noise above water)	Construction and Decommiss
		Accidental spills	Construction,Operation and I
		Litter	Construction,Operation and E
	Redshank	Disturbance and displacement (noise above water)	Construction and Decommiss
ť		Accidental spills	Construction,Operation and E
		Litter	Construction,Operation and E
	Shelduck	Disturbance and displacement (noise above water)	Construction and Decommiss
		Accidental spills	Construction,Operation and E
		Litter	Construction,Operation and I
	Pintail	Disturbance and displacement (noise above water)	Construction and Decommiss
Τε		Accidental spills	Construction,Operation and E
		Litter	Construction,Operation and I
	Shoveler	Disturbance and displacement (noise above water)	Construction and Decommiss
		Accidental spills	Construction,Operation and [
		Litter	Construction,Operation and E
	Teal	Disturbance and displacement (noise above water)	Construction and Decommiss
		Accidental spills	Construction,Operation and E
		Litter	Construction,Operation and [
	Wigeon	Disturbance and displacement (noise above water)	Construction and Decommiss
		Accidental spills	Construction,Operation and E
		Litter	Construction,Operation and E
	Bar-tailed godwit	Disturbance and displacement (noise above water)	Construction and Decommiss
		Accidental spills	Construction,Operation and I
		Litter	Construction,Operation and E
	Black-tailed godwit	Disturbance and displacement (noise above water)	Construction and Decommiss



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European site	Feature	Effect	Project phase/s
		Accidental spills	Construction, Operation and Decommissioning
	Curlew	Disturbance and displacement (noise above water)	Construction and Decommissioning
		Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Turnstone	Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Sanderling	Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Grey plover	Disturbance and displacement (noise above water)	Construction and Decommissioning
		Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Ringed plover	Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Dunlin	Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Waterfowl assemblage	Disturbance and displacement (noise above water)	Construction and Decommissioning
		Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Supporting habitats (freshwater and grazing marsh)	Indirect effects (temporary habitat loss)	Construction and Decommissioning
		Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
Portsmouth Harbour	Dark-bellied brent goose	Disturbance and displacement (noise above water)	Construction and Decommissioning
SPA/Ramsar		Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Dunlin	Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Black-tailed godwit	Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning
	Supporting habitats (freshwater and grazing marsh)	Indirect effects (temporary habitat loss)	Construction and Decommissioning
		Accidental spills	Construction, Operation and Decommissioning
		Litter	Construction, Operation and Decommissioning



WSP/Natural Power



10. DETERMINATION OF POTENTIAL ADVERSE EFFECTS (ONSHORE AND MARINE SITES)

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 and Appendix 5 of this report which presents the PINS integrity matrices for European Marine and Ramsar sites respectively.

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 effects 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 presents 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') (APP-488) submitted with



the Application and secured through the Deemed Marine Licence ('dML') which is part of the Draft Development Consent Order (APP-019, Rev 002). 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.
- 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 (APP-019, Rev 002) 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 (APP-488) 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,

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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 Marine and Ramsar 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 Marine and Ramsar 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. ONSHORE AND MARINE: CHICHESTER AND LANGSTONE HARBOURS SPA/RAMSAR SITE

10.3.1. **OVERVIEW**

- 10.3.1.1. Chichester and Langstone Harbours SPA/Ramsar 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.
- 10.3.1.2. 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.
- 10.3.1.3. 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.
- 10.3.1.4. 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.

- 10.3.1.5. 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.
- 10.3.1.6. Areas outside the SPA contain important supporting habitats for the birds, including coastal grazing marsh, amenity grassland and agricultural land (Natural England, 2019a).

10.3.2. MARINE CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.3.2.1. Site-specific SACO is available for the Chichester and Langstone Harbours SPA^{Error!} Bookmark not defined. Table 10.1 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 10.1 – Marine SACO attributes screened in for assessment

10.3.2.2. 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.

10.3.3. ONSHORE CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.3.3.1. Table 10.2 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 10.2 – Onshore SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Dark-bellied brent goose Redshank Shelduck Pintail Shoveler Teal Wigeon Bar-tailed godwit Black-tailed godwit Curlew Waterfowl assemblage	Disturbance and displacement	Disturbance caused by human activity



Feature	Impact for which LSE could not be excluded	Equivalent attribute
Little tern Sandwich tern Common tern Dark-bellied brent goose Redshank Shelduck Pintail Shoveler Teal Wigeon Bar-tailed godwit Black-tailed godwit Curlew Turnstone Sanderling Grey plover Ringed plover Dunlin	Accidental spills and Litter	Supporting habitat: food availability
Waterfowl assemblage	Accidental spills and Litter	Supporting habitat: quality of supporting non-breeding habitat
Supporting habitat (freshwater and coastal grazing marsh)	Indirect effects	Supporting habitat: extent and distribution of supporting habitat for the non-breeding season
	Accidental spills and Litter	Supporting habitat quality of supporting non-breeding habitat

10.3.4. ONSHORE AND MARINE ASSESSMENTS OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.3.4.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10.3 for marine features and Table 10.4 for onshore/intertidal features below.
- 10.3.4.2. It is concluded that there will be no adverse effect on the site integrity of Chichester and Langstone Harbours SPA/Ramsar, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10.3 – Marine 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	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.	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 Harbor known to both feed and a 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 area towards Langstone Bridg location may therefore di unpredictable noise ever However, these works w industrialised setting. Vit duration (two hours for in levels from the EMV at H Marshes, given that SPL distance is doubled. Nois with construction activitie above baseline levels of of Langstone Harbour (C Given that HDD1 and HE red-breasted merganser there is no potential for in these locations, both of v urban environment Outside of Langstone Har be present in shallow, ne Solent. There is therefore birds to be disturbed and unpredictable noise ever with construction activitie Eastney, and elsewhere Vibro-hammering at the duration and noise gener driving machine will be n will not be noticeable abor Red-breasted merganser in water depths of <10 m



ser are considered to be of moderate ce and therefore displacement Gittings & O'Donoghue, 2016).

our, red-breasted mergansers are 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 will not be noticeable of disturbance within the urban setting (Cutts & Allen, 1999; Cutts et al., 2009). HDD2 are located further away from er roosting areas, it is considered that impact from onshore HDD works at which are located above MHWS in an

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. marine HDD location will be short in erated by the vibro-hammers and pipenon-percussive and airbourne SPLs bove the baseline in this urban setting. sers dive from the sea surface to forage m (Robbins, 2017). Whilst they may be

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 exposed to underwater and pipe driving machin be discernible above bas (median noise levels are dB re 1 µPa; Merchant et ogether with a multicat, vessel and up to four we HDD location for up to 4 movements predicted or noticeable above baselie existing high levels of transcipated that there mover the course of the a period. Construction vest barges that have difficul safe passage distance or number of vessels preserves is likely that each vesses of the rolling safe passa (hours to days). The pollow tide between KP 1.0 duration of up to 4 week the Channel and Solent breasted mergansers the forage and roost will be disturbance. During operation, an ind Marine Cables would re is therefore considered id disturbance/displaceme would be less than pred Therefore, it is considered id set of the safe of the same of the cables would re is therefore considered is therefore considered is effects on site integrity a Potential effects resulting the spatial over (Table 4 of Appendix 3) and temporary.



r noise resulting from the vibro-hammer ne during this time, noise levels will not ackground underwater noise levels round the UK range from 81.5 to 95.5 *et al.*, 2016). A single jack-up vessel, t, a safety vessel, a crew transfer vorkboats may be present at the marine 44 weeks, with a total of 636 vessel over this period. This will not be line levels of disturbance from the traffic within the area.

the Marine Cable Corridor, it is nay be up to c.825 vessel movements anticipated 30-month construction essels such as the larger CLVs and ulty in manoeuvring will have a rolling of up to 700 m. Whilst there may be a sent during each stage of installation, it el will only be present in any one area tage distance for very short durations otential grounding of cable lay barges at .0 and KP 4.7 will occur over a short eks. Furthermore, vessel traffic levels in nt are already high. As such, redthat use the Marine Cable Corridor to e habituated to such levels of

dicative worst-case failure rate of the equire once 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 is 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

d that there will be no adverse effect on rbance and displacement effects, either n with other project and plans (see ices for further details).

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
		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 sensitivit <i>al.</i> , 2014). If seabed hab are disturbed, the area r potential food sources, r Furthermore, red-breast and are likely to be affect can make it harder to se construction have the po- water column during cat Within Langstone Harbo numbers are likely to be entry/exit points of the d there is no pathway for t suspended sediment or works are considered to merganser prey species Outside of Langstone Ha pits (KP 1.0-1.6), and cat the liberation and disper and 15, and in other isol sediments up to 10 km f at these distances will be discernible above natura approximately <5 to 75 r there will be no effects o Elsewhere within the Ma disturbed habitat for rout maximum of 3.6 km ² alo (c.6%). High densities of predicted beyond KP 21 shallow, coastal waters of area where densities are predicted that a peak SS locally (i.e. within 2 km of concentrations could pot following completion of c plumes are also predicted the cable trench/HDD pi 10 mg/l are predicted; S background levels within these activities. Most fish and shellfish a suspended sediment ow



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.

oour where red-breasted merganser e highest, HDD will be used. The drill are expected to be onshore, thus the works to result in an increase in r resultant smothering. Therefore, the to have no effect on 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 from the release point. However, SSC be low (< 5 mg/l) and therefore not ral variation, which ranges from img/l in coastal areas. In consequence, on prey species at the Landfall larine Cable Corridor, the area of ute preparation is anticipated to be a long the entire Marine Cable Corridor of red-breasted merganser are not 1 given the species' preference for (Robbins, 2017). Within the nearshore re likely to be 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 construction activities. Sediment ted to be transported up to 5 km from pit at which point concentrations of 5 to SSC is expected to return to in a few days following completion of

are able to tolerate a degree of wing to frequent exposure to storm

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 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 Ha shellfish habitat as a res not material in terms of i these measures will be I During operation, the rep although unlikely, may b failure rate of the Marine every 10-12 years. Cabl similar or lesser effects a potential increases in SS construction due to the s duration of works and th no adverse effects will o Therefore, it is considered availability resulting from increased turbidity from not result in an adverse Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is considered effects on site integrity find
					either alone or in combir (see Appendix 1 PINS m
			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 increa harder to see prey. They sensitive to habitat distu Activities associated with maintenance works have the water column during e.g. HDD pit excavation. However, since HDD will with an onshore exit point is considered to be negli



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 f its effect on prey availability since e limited in spatial extent (c. 0.7 km²).

epair or replacement of cables, be required. An indicative worst-case be Cables could require a repair once ole repair has the potential to have as during construction, however, SSC would be lower than during smaller scale of a repair, the shorter the more localised nature of work and occur as a result these potential works.

red that potential effects on prey m seabed disturbance/loss and n the Proposed Development alone will e effect on site 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 disturbance and displacement, bination with other project and plans matrices for further details).

sers are visual foragers and are likely to ase in turbidity which can make it by are considered to be moderately curbance (Bradbury *et al.*, 2014).

ith construction, repair and

ve the potential to release sediment into og cable burial and associated works n.

vill be used within Langstone Harbour, bint, the volume of suspended material gligible.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					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 at these distances will b discernible above natura approximately <5 to 75 r species at the Landfall a material since both hab will be temporary, short Elsewhere within the Ma disturbed habitat for rour maximum of 3.6 km ² alo (c.6%). High densities or 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 por 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. During operation, repair unlikely, may be require of the Marine Cables co years. Cable repair has effects as during constru SSC would be lower that smaller scale of a repair more localised nature of As such, the potential for resulting from increased Development alone will integrity. Potential effects resultin temporal and spatial over (Table 4 of Appendix 3) and temporary. As such, it is concluded site integrity from effects



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, SSC be low (< 5 mg/l) and therefore not ral variation, which ranges from 6 mg/l in coastal areas. Effects on prey are therefore considered to be not bitat disturbance and increases in SSC t in duration and small in extent.

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 s (Robbins, 2017). Within the nearshore re likely to be highest (KP 0-21), it is SSC of up to 200 mg/I 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 t which point concentrations of 5 to 10 C is expected to return to background s following completion of these

ir or replacement of cables, although red. An indicative worst-case failure rate could require a repair once every 10-12 is the potential to have similar or lesser truction, however, potential effects from nan during construction due to the hir, the shorter duration of works and the of work.

for effects from reduced prey availability ed turbidity from the Proposed Il not have an adverse effect on site

ng from plans or projects which have verlap with the Proposed Development) are considered to be highly localised

d that there will be no adverse effect on ts on prey species within the water

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					column from increased t with other project and pl for further details).
		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 red-breast surface through direct of disposal of industrial or phases also has the pot merganser mortality thro
					However, routine mitigat practice in terms of was measures and strict nav events and it is predicted measures, there will be
					Given the scale and nat projects and the required measures which could of concluded that there will either alone or in combin (see Appendix 1 PINS n
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> , 20 Within Langstone and C of little tern are present. forage in relatively close (Thaxter <i>et al.</i> , 2012)ons Harbour have potential t given its moderate sens three onshore HDD loca closest location to a little minimum distance of <i>c.</i> 2 Sheet piling at HDD3 ma foraging birds through u However, these works w industrialised setting. Vii duration (two hours for in levels from the EMV at H Island, given that SPLs is doubled. Noise and vii construction activities at baseline levels of disturk (Cutts & Allen, 1999; Cu



turbidity, either alone or in combination plans (see Appendix 1 PINS matrices

t phases. Spills have the potential to sted mergansers utilising the sea oiling resulting in mortality. Unplanned r user plastic during all development otential to cause red-breasted rough ingestion or entanglement.

ation measures of standard best iste management, pollution prevention avigational protocols will prevent these ted that, in consideration of mitigation e no adverse effects on site integrity.

ature of other potential plans and rement to adhere to similar best practice contribute to in combination effects, it is vill be no adverse effect on site integrity pination with other plans and projects matrices for further details).

scored as being of moderate sensitivity erefore displacement (Garthe & Hüppop, 2014).

Chichester Harbours, breeding colonies at. Given that little terns are known to se proximity to their breeding colonies onshore HDD works within the Langstone at to displace this species during foraging nsitivity to disturbance at sea. Of the cations, 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.

s will be above MHWS in an already Vibro-hammering will be very short in r installation at each location) and noise it HDD3 will be *c*.40 dB at Baker's s reduce by 6 dB each time the distance visual disturbance associated with at HDD3 will not be noticeable above urbance within Langstone Harbour Cutts *et al.*, 2009). In any event, were

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					little terns be temporarily to the onshore HDD wo equivalent foraging sites and Langstone Harbour Proposed Development
					Given that HDD1 and H little tern breeding colon potential for adverse eff locations, both of which environment. Outside of Langstone H shallow, nearshore wate There is therefore poter and displaced by both u disturbance associated marine HDD location of
					Vibro-hammering at the duration and noise gene driving machine will be will not be noticeable at Since little terns plunge feeding (RPS, 2011), it underwater noise result driving machines will be background underwater around the UK range fro <i>et al.</i> , 2016). A single ja a safety vessel, a crew to workboats may be prese to 44 weeks, with a tota over this period. The po low tide between KP 1.0 duration of up to 4 week baseline levels of distur
					traffic within the area. Given that the foraging nearshore waters up to <i>et al.</i> , 2015), construction impact this feature. How be up to c.825 vessel m construction stage throu including at the marine month construction perio larger CLVs and barges have a rolling safe pass



rily disturbed from foraging in proximity vorks within Langstone Harbour, other es are present elsewhere in Chichester urs which will be unaffected by the nt.

HDD2 are located further away from onies, it is considered that there is no effects from onshore HDD works at these on 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 unpredictable noise events and visual d with construction activities at the off Eastney.

e marine HDD location will be short in nerated by the vibro-hammers and pipenon-percussive and airbourne SPLs bove the baseline in this urban setting. e dive to a maximum of 1 m whilst is considered that exposure to any Iting from the vibro-hammer and pipe be minimal and not discernible above er noise levels (median noise levels rom 81.5 to 95.5 dB re 1 µPa; Merchant jack-up vessel, together with a multicat, 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 eks. This is will not be noticeable above urbance from the existing high levels of

g range of little tern is restricted to o c.10 km (Thaxter *et al.*, 2012; Parsons tion activities beyond this range will owever, it is anticipated that there may movements over the course of the oughout the Marine Cable Corridor, e HDD location, over the anticipated 30eriod. Construction vessels such as the es that have difficulty in manoeuvring will ssage distance of up to 700 m. Whilst

Feature	Conservation Objectives	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 be habituated to such le Therefore, potential dist from the Proposed Deve adverse effect on little te and there will be no adv Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is considered site integrity from disture or in combination with o and Appendix 5 PINS m
		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 effectivel 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. Furthermor likely to be affected by a it harder to see prey from associated with construe sediment into the water associated works. Within Langstone Harbo
					 Within Langstone Harbox may be high; HDD will b drill are expected to be of the works to result in an resultant smothering. Th have no material effect of Harbour. Outside of Langstone Harbox pits (KP 1.0-1.6), and car
					the liberation and disper and 15, and in other iso sediments up to 10 km t at these distances will b



er 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 will levels of disturbance.

sturbance and displacement effects evelopment alone will not result in an tern as a qualifying feature of this SPA, dverse effect on site integrity.

ting from plans or projects which have overlap with the Proposed Development 3) are considered to be highly localised

ed that there will be no adverse effect on urbance and displacement, either alone other project and plans (see Appendix 1 matrices for further details).

rely top predators of benthos, fish and and are considered likely to be of b habitat disturbance (Garthe & Hüppop, 2014). If seabed habitats (and therefore disturbed, the area may be temporarily al food sources, resulting in effective ore, terns are visual foragers and are an increase in turbidity which can make rom the sea surface. Activities ruction have the potential to release er column during cable burial and

bour where foraging little tern numbers I 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 considered to ct on 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, SSC be low (< 5 mg/l) and therefore not

		discernible above natura
		approximately <5 to 75 species at the Landfall a since both habitat distur- temporary, short in dura Elsewhere within the Uk foraging little tern densi (Parsons <i>et al.</i> , 2015), t preparation is anticipate the entire UK Marine Ca- tern are not expected to mean-maximum foragin <i>al.</i> , 2012). Within this ne predicted that a peak SS 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. Most prey species are a sediment owing to frequ fluctuations in sediment background levels of su already (Guillou, <i>et al.</i> , 3
		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, of cable non-burial prote effect on prey availabilit
		in spatial extent (c.0.7 k During operation, the re although unlikely, may b failure rate of the Marine every 10-12 years. Cab similar or lesser effects potential increases in S construction due to the duration of works and th As such, the potential for



ural variation, which ranges from 5 mg/l in coastal areas. Effects on prey l are therefore considered not material urbance and increases in SSC will be ration and small in extent.

JK Marine Cable Corridor, where sities are likely to be much lower , the area of disturbed habitat for route ted to be a maximum of 3.6 km² along Cable Corridor (*c*.6%). Breeding little to be present beyond KP 21 given their ing range (6.3 km ± 2.4 km; Thaxter et nearshore area (KP 0 - 21), it is SSC of up to 200 mg/l may be observed of the 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

e 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 would have no adverse effect lity since these measures will be limited km²).

repair or replacement of cables, / be required. An indicative worst-case ne Cables could require a repair once able repair has the potential to have is as during construction, however, SSC would be lower than during e smaller scale of a repair, the shorter the more localised nature of work.

for effects from reduced prey availability disturbance/loss and increased turbidity

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 from the Proposed Deveration of the Proposed Deveration of the proposed Deveration of the proposed Deveration of the proposed of the
			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 disturbance (Bradbury e construction, repair and to release sediment into installation and associat However, since HDD wil with an onshore exit poir is considered to be negl 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 at these distances will b discernible above natura approximately <5 to 75 m no adverse effects on th Landfall since both habit will be temporary, short Elsewhere within the Ma little tern densities are lil 2015), the area of distur anticipated to be a maxi Marine Cable Corridor (a expected to be present f maximum foraging range 2012). Within this nears that a peak SSC of up to (i.e. within 2 km of the ca concentrations could po following completion of a plumes are also likely to



velopment alone will not adversely here will be no adverse effects on site

ting from plans or projects which have overlap with the Proposed Development 3) are considered to be highly localised

ed that there is no potential for adverse r from effects on prey availability, either n with other project and plans (see ndix 5 PINS matrices for further details).

Foragers and are likely to be affected by y which can make it harder to see prey. o be moderately sensitive to habitat *v et al.*, 2014). Activities associated with and maintenance works have the potential to the water column during cable iated works e.g. HDD pit excavation. will be used within Langstone Harbour, oint, the volume of suspended material egligible.

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 from the release point. However, SSC be low (< 5 mg/l) and therefore not ural variation, which ranges from mg/l in coastal areas. There would be the availability of prey species at the bitat disturbance and increases in SSC rt in duration and small in extent. Marine Cable Corridor, where foraging likely to be much lower (Parsons *et al.*, urbed habitat for route preparation is ximum of 3.6 km² along the entire (c.6%). Breeding little tern are not t beyond KP 21, given their meannge (6.3 km ± 2.4 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 construction activities. Sediment to be transported up to 5 km from the

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					cable trench/HDD pit at mg/l are predicted; SSC levels within a few days activities. During operation, the re although unlikely, may b failure rate of the Marine every 10-12 years. Cabl similar or lesser effects potential increases in SS construction due to the s
					duration of works and the no adverse effects on si As such, the potential for resulting from increased Development alone is co- effect on site integrity. Potential effects resulting temporal and spatial over (Table 4 of Appendix 3) and temporary. As such, it is considered site integrity from effects column, either alone or in plans (see Appendix 1 a
		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.	further details). Unplanned oil or chemic during all development p directly affect little terns oiling resulting in mortal user plastic during all de potential to cause little to entanglement. However, routine mitiga practice in terms of was measures and strict nav events occurring and the consideration of mitigati effect on site integrity fro Given the scale and nat projects and the require measures which could of predicted that there will



at which point concentrations of 5 to 10 SC is expected to return to background /s following completion of these

repair or replacement of cables, / be required. An indicative worst-case ne Cables could require a repair once able repair has the potential to have as as during construction, however, SSC would be lower than during e smaller scale of a repair, the shorter the more localised focus of work, with site integrity.

for effects from reduced prey availability ed turbidity from the Proposed concluded not to result in an adverse

ting 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 and Appendix 5 PINS matrices for

nical spillages from vessels may occur it phases. Spills have the potential to ns utilising the sea surface through direct cality. Unplanned disposal of industrial or development phases also has the tern mortality through ingestion or

gation measures of standard best aste management, pollution prevention avigational protocols will prevent these therefore it is predicted that, in ation measures, there will be no adverse from the Proposed Development alone. ature of other potential plans and rement to adhere to similar best practice a contribute to in combination effects, it is ill be no adverse effect on site integrity in

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					combination with other p and Appendix 5 PINS m
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 effect and shellfish populations moderate sensitivity to h 2004; Bradbury <i>et al.</i> , 20 the prey species) are dis devoid of any potential fo 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 sm adversely affect tern pre 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 fi at these distances will be discernible above natura approximately <5 to 75 r adverse effects on the a Landfall since both habit will be temporary, short i Elsewhere within the Ma Sandwich tern densities the area of disturbed hal anticipated to be a maxin Marine Cable Corridor (of distributions presented in of breeding Sandwich te Within the area of highes peak SSC of up to 200 r within 2 km of the cable concentrations could pot following completion of of plumes are also likely to cable trench/HDD pit at mg/l are predicted; SSC



plans and projects (see Appendix 1 natrices for further details).

ectively top predators of benthos, fish ns and are considered likely to be of habitat disturbance (Garthe & Hüppop, 2014). If seabed habitats (and therefore listurbed, the area may be temporarily food sources, resulting in effective ore, terns are visual foragers and are an increase in turbidity which can make om the sea surface. Activities uction have the potential to release r column during cable burial and

oour, HDD will be used. The entry/exit spected to be onshore, thus there is no to result in an increase in suspended mothering. Therefore, the works will not rey species 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 from the release point. However, SSC be low (< 5 mg/l) and therefore not ral variation, which ranges from 6 mg/l in coastal areas. There will be no availability of prey species at the bitat disturbance and increases in SSC t in duration and small in extent.

Aarine Cable Corridor, where foraging s may be lower (Wilson *et al.*, 2014), abitat for route preparation is kimum of 3.6 km² 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

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 levels within a few days activities. Most prey species are al sediment owing to freque fluctuations in sediment 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 Hapermanent loss of fish, so of cable non-burial prote availability since these mextent (<i>c</i>.0.7 km²). During operation, the regalthough unlikely, may b failure rate of the Marine every 10-12 years. Cable similar or lesser effects a potential increases in SS construction due to the seduration of works and the no adverse effects on site from the Proposed Dever result in any adverse effects resulting the propartial over (Table 4 of Appendix 3) and temporary. As such, adverse effects on site in prey availability, either a project and plans (see Adetails).
			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 in see prey. They are const habitat disturbance (Brack associated with construct have the potential to relead during cable installation since HDD will be used with



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 will not materially affect the prey measures will be limited in spatial

epair or replacement of cables, be required. An indicative worst-case ne Cables could require a repair once ole repair has the potential to have as during construction, however, SSC would be lower than during e smaller scale of a repair, the shorter the more localised nature of work, with site integrity.

for effects from reduced prey availability disturbance/loss and increased turbidity velopment alone is concluded not to ffect on site integrity.

ng from plans or projects which have verlap with the Proposed Development) 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 uction, repair and maintenance works elease sediment into the water column n and associated works. However, d within Langstone Harbour, with an

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					onshore exit point, the v considered to be negligi
					considered to be negligit Outside of Langstone H pits (KP 1.0-1.6), and ca the liberation and disper and 15, and in other iso sediments up to 10 km f at these distances will b discernible above natura approximately <5 to 75 f adverse effects on the a Landfall since both hab will be temporary, short Elsewhere within the Ma Sandwich tern densities the area of disturbed ha anticipated to be a maxi Marine Cable Corridor (distributions presented i of breeding Sandwich te Within the area of highe peak SSC of up to 200 r within 2 km of the cable concentrations could po 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. During operation, the re although unlikely, may b
					failure rate of the Marine every 10-12 years. Cab similar or lesser effects potential increases in S construction due to the duration of works and th no adverse effect on site
					As such, the potential for resulting from increased Development alone is consite integrity. Potential effects resulting
					temporal and spatial over



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, SSC be low (< 5 mg/l) and therefore not ral variation, which ranges from mg/l in coastal areas. There will be no availability of prey species at the bitat disturbance and increases in SSC t in duration and small in extent. larine Cable Corridor, where foraging s may be lower (Wilson et al., 2014), abitat for route preparation is ximum of 3.6 km² 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/I 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

epair or replacement of cables, be required. An indicative worst-case ne Cables could require a repair once ble repair has the potential to have s as during construction, however, SSC would be lower than during e smaller scale of a repair, the shorter the more localised nature of work, with ite integrity.

for effects from reduced prey availability ed turbidity from the Proposed concluded not to result in any adverse .

ing from plans or projects which have verlap with the Proposed Development

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	-				 (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 Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemic during all development directly affect Sandwich direct oiling resulting in industrial or user plastic has the potential to caus ingestion or entangleme
					However, routine mitiga practice in terms of was measures and strict nav <u>preventthese</u> events occ that, in consideration of adverse effects on site i
					Given the scale and nat projects and the require measures which could o predicted that there will combination with other
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 population moderate sensitivity to h 2004; Bradbury <i>et al.</i> , 24 the prey species) are dis devoid of any potential f habitat loss. Furthermor likely to be affected by a it harder to see prey from associated with constru- sediment into the water associated works e.g. H Within Langstone Harbo points of the drill are exp pathway for the works to sediment or resultant sh adversely affect tern preson Outside of Langstone H pits (KP 1.0-1.6), and ca the liberation and dispendiced



) are considered to be highly localised

ed that there are no adverse effects on cts on prey species within the water r in combination with other project and PINS matrices for further details).

nical spillages from vessels may occur it phases. Spills have the potential to ch terns utilising the sea surface through n mortality. Unplanned disposal of tic during all development phases also suse Sandwich tern mortality through nent.

gation measures of standard best aste management, pollution prevention avigational protocols will prevent these occurring and therefore it is predicted of mitigation measures, there will be no e 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 in r plans and projects.

ectively top predators of benthos, fish ons and are considered likely to be of o habitat disturbance (Garthe & Hüppop, 2014). If seabed habitats (and therefore disturbed, the area may be temporarily of food sources, resulting in effective ore, terns are visual foragers and are y 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 will not brey species in Langstone Harbour.

Harbour, excavation at the marine HDD cable installation (due to the potential for bersal of fines identified between KP 5

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute	Target	and 15, and in other iso sediments up to 10 km is at these distances will be discernible above nature approximately <5 to 75 adverse effects on prey habitat disturbance and short in duration and sm Elsewhere within the Ma common tern densities is area of disturbed habitat be a maximum of 3.6 km Corridor (<i>c</i> .6%). Breedin present beyond KP 21 is 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 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 H no adverse effect on pr will be limited in spatial During operation, the re although unlikely, may b failure rate of the Marine
					every 10-12 years. Cab similar effects as during increases in SSC would to the smaller scale of a and the more localised on site integrity.



solated locations) will transport the finest in from the release point. However, SSC be low (< 5 mg/l) and therefore not ural variation, which ranges from 5 mg/l in coastal areas. There will be no by species at the Landfall since both ind increases in SSC will be temporary, small in extent.

Marine Cable Corridor, where foraging s may be lower (Wilson *et al.*, 2014), the tat for route preparation is anticipated to km² along the entire Marine Cable ding 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

e 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, there will be prey availability since these measures al extent ($c.0.7 \text{ km}^2$).

repair or replacement of cables, / be required. An indicative worst-case ne Cables could require a repair once able repair has the potential to have ng construction. However, potential Id be lower than during construction due a repair, the shorter duration of works d nature of work, with no adverse effect

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					As such, the potential for resulting from seabed di from the Proposed Dever result in any adverse effer Potential effects resulting temporal and spatial over (Table 4 of Appendix 3) and temporary. As such, it is concluded site integrity from effects combination with other p PINS matrices for furthe
			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 turbidit prey. They are considered habitat disturbance (Bra 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 neglit 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 at these distances will be discernible above natural approximately <5 to 75 r adverse on prey species habitat disturbance and short in duration and sm Elsewhere within the Ma common tern densities r area of disturbed habitat be a maximum of 3.6 km Corridor (c.6%). Breedin present beyond KP 21 in maximum foraging range 2012). Within this nears that a peak SSC of up to (i.e. within 2 km of the ca concentrations could point)



for effect from reduced prey availability disturbance/loss and increased turbidity velopment alone is concluded to not effect on site integrity.

ing from plans or projects which have verlap with the Proposed Development 3) are considered to be highly localised

ed that there are no adverse effects on ets on prey availability, either alone or in r project and plans (see Appendix 1 ner 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 into the water column d associated works.

vill be used within Langstone Harbour, oint, 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 n from the release point. However, SSC be low (< 5 mg/l) and therefore not iral variation, which ranges from 5 mg/l in coastal areas. There will be no es availability the Landfall since both d increases in SSC will be temporary, mall in extent.

Marine Cable Corridor, where foraging s may be lower (Wilson *et al.*, 2014), the tat for route preparation is anticipated to km^2 along the entire Marine Cable ling common tern are not expected to be in high densities, given their meanage (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

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					following completion of a plumes are also likely to cable trench/HDD pit at mg/l are predicted; SSC levels within a few days activities. During operation, the re although unlikely, may b failure rate of the Marine every 10-12 years. Cabl similar effects as during increases in SSC would to the smaller scale of a and the more localised r on site integrity. As such, the potential for resulting from increased Development alone will integrity. Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is predicted to 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 Annex X of the WFD, avoiding deterioration from existing levels.	Unplanned oil or chemic during all development p directly affect common to direct oiling resulting in industrial or user plastic has the potential to caus ingestion or entangleme However, routine mitiga practice in terms of was measures and strict nav events occurring and the consideration of mitigati effects on site integrity. Given the scale and nat projects and the require measures which could of



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

repair or replacement of cables, / be required. An indicative worst-case ne Cables could require a repair once able repair has the potential to have ng construction, however, potential Id be lower than during construction due a repair, the shorter duration of works d nature of work, with no adverse effects

for effects from reduced prey availability ed turbidity from the Proposed ill not result in any adverse effect on site

ting 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 effect on cts to prey species within the water or in combination with other project and I PINS matrices for further details).

nical spillages from vessels may occur it phases. Spills have the potential to in terns utilising the sea surface through in mortality. Unplanned disposal of tic during all development phases also suse common tern mortality through nent.

gation measures of standard best aste management, pollution prevention avigational protocols will prevent these therefore it is predicted that, in ation measures, there will be no adverse /.

ature of other potential plans and rement to adhere to similar best practice I contribute to in combination effects, it is

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					predicted that there will combination with other p
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 conhabitats. High turbidity of warmer months. Low DO impacts on key prey speadversely affect the avafeature feeding habitat. A repair and maintenance sediment and increase the associated works. Howe Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with suspended material is of Outside of Langstone Harbour, with these distances will be discernible above nature approximately <5 to 75 methods and the seconcentral several hours following of Sediment plumes are als from the cable trench/HI 5 to 10 mg/l are predicted background levels within these activities. During operation, the repaithough unlikely, may be failure rate of the Marine every 10-12 years. Cable similar or lesser effects apotential increases in SS construction due to the seduration of works and the no adverse effect on site. As such, the potential for water column resulting for the seduration of works and the no adverse effect on site.



ill be no adverse effect on site integrity in r plans and projects.

ondition and health of supporting can lead to a drop in DO, especially in DO can have sub-lethal and lethal becies (Best *et al.*, 2007) and hence can vailability and suitability of qualifying t. Activities associated with construction, we works have the potential to release 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 colated locations) will transport the finest in from the release point. However, SSC be low (< 5 mg/l) and therefore not ural variation, which ranges from 5 mg/l in coastal areas.

Aarine Cable Corridor, the area of oute preparation is anticipated to be a long the entire Marine Cable Corridor that 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 eted; SSC is expected to return to hin a few days following completion of

repair or replacement of cables, be required. An indicative worst-case ne Cables could require a repair once ble repair has the potential to have s as during construction. However, SSC would be lower than during e smaller scale of a repair, the shorter the more localised nature of work, with ite integrity.

for effect on key prey species within the from a drop in DO from the Proposed

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Development alone will site integrity. Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3) and temporary. As such, it is concluded site integrity from effects DO, either alone or in conclusion (see Appendix 1 PINS not concluded site integrity for site integrity for
			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 in has a number of potential water column, such as a filtering organs of susper adversely affect the ava feature feeding habitat. A repair and maintenance sediment and increase to associated works. However, since HDD will with an onshore exit point is considered to be negl 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 at these distances will b discernible above natura approximately <5 to 75 n adverse effects on the a Landfall since both habit will be temporary, short Elsewhere within the Ma disturbed habitat for rou maximum of 3.6 km ² alo (c.6%). It is predicted that be observed locally (i.e. pit) and these concentrat several hours following of Sediment plumes are all from the cable trench/HI 5 to 10 mg/l are predicted



Il not result in any adverse effects on

ing from plans or projects which have verlap with the Proposed Development b) are considered to be highly localised

d that there will be no adverse effect on ets on prey availability from a drop in combination with other project and plans matrices for further details).

in turbidity through sediment release atial implications for prey species in the affecting fish health and clogging the bension feeding animals. This in turn can vailability and suitability of qualifying t. Activities associated with construction, we works have the potential to release a turbidity during cable installation and

vill be used within Langstone Harbour, oint, 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 solated locations) will transport the finest in from the release point. However, SSC be low (< 5 mg/l) and therefore not ural variation, which ranges from 5 mg/l in coastal areas. There will be no availability of prey species at the bitat disturbance and increases in SSC rt in duration and small in extent.

Marine Cable Corridor, the area of oute preparation is anticipated to be a long the entire Marine Cable Corridor that 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 cted; SSC is expected to return to

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
			-		background levels within these activities.
					During operation, the realthough unlikely, may be failure rate of the Marine every 10-12 years. Cab similar or lesser effects potential increases in St construction due to the duration of works and the resulting in no adverse of As such, the potential for the Proposed Developm
					any adverse effect on si Potential effects resultin temporal and spatial ove (Table 4 of Appendix 3)
					As such, it is considered on site integrity from eff or in combination with o 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 effect user plastic during all de potential to affect prey s entanglement.
					However, routine mitigate practice in terms of was measures and strict nave preventthese events occonsideration of mitigation effects on site integrity for the strict of
					Given the scale and nat projects and the require measures which could of predicted that there will combination with other

Conclusion: No 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.



in a few days following completion of

repair or replacement of cables, be required. An indicative worst-case ne Cables could require a repair once ble repair has the potential to have s as during construction. However, SSC would be lower than during e smaller scale of a repair, the shorter the more localised nature of work, e effects on site integrity.

for effect from increased turbidity from ment alone is concluded not to result in site integrity.

ing from plans or projects which have verlap with the Proposed Development B) 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 ner details).

nical spillages from vessels may occur t phases. Spills have the potential to ecies within the water column through a ects. Unplanned disposal of industrial or development phases also has the species through ingestion or

ation measures of standard best iste management, pollution prevention avigational protocols will prevent these ccurring therefore it is predicted that, in ition measures, there will be no adverse of from the Proposed Development alone.

ature of other potential plans and rement to adhere to similar best practice contribute to in combination effects, it is Il be no adverse effect on site integrity in r plans and projects.

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Table 10.4- Onshore 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 Conservation C	bjectives Effect	Attribute	Target	Assessment
Feature Conservation Conservatinde Conservation Conservation Conservation Co	estoring Accidental of spills and es, and Litter of	Attribute Supporting habitat: water quality - contaminants	Target 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.	 Assessment Unplanned oil or chemical spillages may occ decommissioning phases. Spills have the pot tern utilising the SPA and other supporting h Unplanned disposal of industrial or user plass decommissioning also has the potential to c ingestion or entanglement However, routine mitigation measures of state management, pollution prevention measures Material Resources of the ES, APP-142)) with prevented and will therefore not result in an Chapter 27 are summarised in the Onshore Management Plan (CEMP) (APP-505 Rev Q Materials Management Plan ('MMP') and Sit ('SWMP'. The key matters of the SWMP are Identify the volume of waste streams like establish the potential for reuse and recy Identify opportunities for waste to be Identify opportunities for waste minimisate Identify suitable waste management licences, permits, waste transfer notes notes; and Consider appropriate site practices such and the measures that will be used for rate for waste reduction, reuse and recycling Best practice recommendations for the prevoutlined in more detail in a detailed CEMP's and agreed with relevant authority prior to come Measures detailed in Chapter 19: Groundwate in the Onshore Outline CEMP (APP-505 Reveroutline). Designated areas for the storage of haza chemicals; On-site availability of oil spill clean-up experiments.



ccur during the construction and potential to directly affect Sandwich habitats resulting in mortality. astic during construction and cause Sandwich tern mortality through

tandard best practice in terms of waste es (see Chapter 27: Waste and will ensure that these events are n adverse effect. Measures detailed in e Outline Construction Environmental 002004) and detail incorporating a Site Waste Management Plan re to:

kely to be produced during the works to cycling;

e 'designed out;

ation and management;

ities to increase re-use and recycling

contractors and record appropriate es and hazardous waste consignment

ch as how materials will be segregated aising awareness among site operative ıg.

vention of contamination will be specific to the works to be undertaken commencement of construction works. vater (APP-134) and further captured ev002<u>Rev004</u>) include:

zardous materials, fuels and

equipment including absorbent n the event of an oil spill or leak;

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Use of drip trays under mobile plant; an Drain socks to trap sediment entering the Therefore, it is considered that potential effection accidental spills and/or litter from the Proposin an adverse effect on site integrity. Potential effects resulting from the limited proposed and spatial overlap with the Proposed Deverse considered to be localised and temporary. Osimilar best practice measures which could is considered that there is no potential for a accidental spills and litter, either alone or in plans (for full details see Appendix 1 for the the SPA and Appendix 5 for the Ramsar site
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 V of the Water Framework Directive, avoiding deterioration from existing levels.	 Unplanned oil or chemical spillages may or decommissioning phases. Spills have the putilising the SPA and other supporting habit disposal of industrial or user plastic during or also has the potential to cause little tern more entanglement. However, routine mitigation measures of stamanagement, pollution prevention measures Material Resources of the ES, APP-142) wiprevented and will therefore not result in an Chapter 27 are summarised in the Onshore Rev002Rev004) and detail incorporating at and Site Waste Management Plan ('SWMP to: Identify the volume of waste streams like to establish the potential for reuse and result in comportunities for waste to be Identify opportunities for waste minimisate. Identify the most significant opportunities rates; Identify suitable waste management complicences, permits, waste transfer notes at notes; and Consider appropriate site practices such and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction, reuse and the measures that will be used for reoperative for waste reduction.



and

the watercourse.

ffects on Sandwich tern resulting from posed Development alone will not result

plans or projects which have temporal velopment (APP-423 and APP-424) are . Given the requirement to adhere to ld contribute to in combination effects, it adverse effects on site integrity from in combination with other project and he screening and integrity matrices for site).

occur during the construction and potential to directly affect little tern bitats resulting in mortality. Unplanned g construction and decommissioning nortality through ingestion or

standard best practice in terms of waste res (see Chapter 27: Waste and will ensure that these events are an adverse effect. Measures detailed in re Outline CEMP (APP-505

a Materials Management Plan ('MMP') IP'). The key matters of the SWMP are

ikely to be produced during the works d recycling;

be 'designed out;

sation and management;

ies to increase re-use and recycling

ontractors and record appropriate s and hazardous waste consignment

ch as how materials will be segregated r raising awareness among site nd recycling.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Best practice recommendations for the preve outlined in more detail in a detailed CEMP sp and agreed with relevant authority prior to co Measures detailed in Chapter 19: Groundwa in the Onshore Outline CEMP (APP-505 Rev
					 Designated areas for the storage of haza chemicals;
					 On-site availability of oil spill clean-up eq material and inflatable booms for use in the
					Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering the
					Therefore, it is considered that potential effe accidental spills and/or litter from the Propos in an adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Devel are considered to be localised and, tempora to similar best practice measures which coul effects, it is considered that there is no poter integrity from accidental spills and litter, eithe project and plans (for full details see Append matrices for the SPA).
tern the p qualit the d qualit	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 chemical spillages may occ decommissioning phases. Spills have the po- utilising the SPA and other supporting habita disposal of industrial or user plastic during co- also has the potential to cause common term entanglement. However, routine mitigation m terms of waste management, pollution prever Waste and Material Resources of the ES, AF are prevented and will therefore not result in detailed in Chapter 27 are summarised in the Rev002 <u>Rev004</u>) and detail incorporating a M and Site Waste Management Plan ('SWMP') to:
					 Identify the volume of waste streams like to establish the potential for reuse and re
					 Identify possible options for waste to be



evention of contamination will be specific to the works to be undertaken commencement of construction works. vater (APP-134) and further captured ev002<u>Rev004</u>) include:

zardous materials, fuels and

equipment including absorbent n the event of an oil spill or leak;

nd

the watercourse.

fects on little tern resulting from osed Development alone will not result

plans or projects which have temporal elopment (APP-423 and APP-424)) rary. Given the requirement to adhere ould contribute to in combination ential for adverse effects on site ther alone or in combination with other ndix 1 for the screening and integrity

ccur during the construction and potential to directly affect common tern itats resulting in mortality. Unplanned construction and decommissioning rn mortality through ingestion or measures of standard best practice in vention measures (see Chapter 27: APP-142) will ensure that these events in an adverse effect. Measures the Onshore Outline CEMP (APP-505 Materials Management Plan ('MMP')

P'). The key matters of the SWMP are

kely to be produced during the works recycling;

e 'designed out;

ation and management;

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Identify the most significant opportunities rates;
					 Identify suitable waste management cor licences, permits, waste transfer notes a notes; and
					 Consider appropriate site practices such and the measures that will be used for ra operative for waste reduction, reuse and
					Best practice recommendations for the prevoutlined in more detail in a detailed CEMP s and agreed with relevant authority prior to control Measures detailed in Chapter 19: Groundwar in the Onshore Outline CEMP (APP-505 Rev
					 Designated areas for the storage of haz chemicals;
					 On-site availability of oil spill clean-up equivalent material and inflatable booms for use in
					Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering th
					Therefore, it is considered that potential effe accidental spills and/or litter from the Proposi in an adverse effect on site integrity.
					Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve are considered to be localised and temporar to similar best practice measures which cou effects, it is considered that there is no pote integrity from accidental spills and litter, eith project and plans (for full details see Appending matrices for the SPA).
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.	Dark-bellied brent goose is considered to be (Cutts <i>et al.</i> , 2013). Therefore, construction in Langstone Harbour and Onshore Cable F SWBGS sites have the potential to disturb d roosting and foraging components of their d setting of the Proposed Development (SWB Owens (1977) describes the effects of anthr



es to increase re-use and recycling

ontractors and record appropriate and hazardous waste consignment

ch as how materials will be segregated raising awareness among site nd recycling.

evention of contamination will be specific to the works to be undertaken commencement of construction works. vater (APP-134) and further captured ev002)<u>Rev004)</u>include:

zardous materials, fuels and

equipment including absorbent n the event of an oil spill or leak;

nd

the watercourse.

fects on common tern resulting from osed Development alone will not result

plans or projects which have temporal velopment (APP-423 and APP-424)) ary. Given the requirement to adhere buld contribute to in combination tential for adverse effects on site ther alone or in combination with other ndix 1 for the screening and integrity

be of high sensitivity to disturbance n activities associated with HDD works Route works in and adjacent to dark-bellied brent geese at both daily cycle despite the industrial /BGS Steering Group, 2018).

hropogenic disturbances on Brent the site of the then proposed London

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Airport at Maplin Sands. The report conclud habituated to most sounds, but unexpected from wildfowlers, usually put the geese to fli day at nearby army gunnery ranges caused quickly returned and ignored all subsequent but regular bangs made during nearby weat the first few weeks.
					Specific surveys for this species for the Prop numbers in both intertidal and terrestrial (i.e. Area (APP-421). Furthermore, given the pro- Development, construction and decommissi the potential to displace wintering dark-bellie foraging and roosting habitat through unpre- work within the SWBGS sites will reduce the habitat where the construction stage overlap bellied brent geese and other wintering birds SPA are present, nominally October to Marco within the sites during winter would produce noise and movements of construction vehicl the availability of remaining grassland within following SWBGS sites overlap with onshore Development:
					 P25 – University of Portsmouth, Langston
					 P23B – University of Portsmouth;
					 P23A – Milton Common north 1;
					 P23R – Milton Common north 2;
					 P11 – Kendall's Wharf playing fields; an
					 P08A – Farlington Farlington Playing F
					P08A – Farlington playing fields. Effects of the and Langstone Harbour SPA and it's winter avoided by restricting works within the winter March (the period when SPA qualifying specarrive from their breeding grounds (Snow ar
					A detailed overview of the working restrictio Onshore Ecology (APP-131) and Appendix Features of Chichester & Langstone Harbou to revisions following consultation with Natu updated Outline Onshore Construction Envi (OOCEMP; APP-505 Rev002) <u>Rev004</u>). The incorporated into working methods: -



uded that brent geese quickly became ed sounds, such as nearby gunshots flight. Similarly, the first shots of the ed the birds to leave the area, but they ent firings for that day. Extremely loud eapon testing caused little reaction after

roposed Development recorded notable .e. SWBGS) components of the Study proximity of these areas to the Proposed asioning works are considered to have llied brent goose from favoured redictable noise events. Construction he availability of grassland foraging aps with the winter season when darkrds that are qualifying features of the arch (Carboneras *et al.* 2019). Work ce direct disturbance of the sites from icles and machinery, further restricting hin the sites as foraging areas. The ore components of the Proposed

stone Campus;

and

Fields

the construction stage on Chichester ering intertidal bird community will be ter season, defined as October to ecies such as dark-bellied brent goose and Perrins, 1998).

ions was provided in Chapter 16: x 16.14: Winter Working Restriction for ours SPA (APP-422) and then subject tural England which are captured in the vironmental Monitoring Plan here are six principles that will be

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Principle 1: Construction works can categorised as either core, primary sup candidate) sites that overlap with the F during October – March. An exception that is already disturbed by movements of functional habitat for brent geese of Chichester and Langstone Harbour SPA
					 Principle 2: Where HDD works are to ta (e.g. at Eastney Landfall) no direct imp restriction does not apply.
					Principle 3: Elements of the Onshore O the SPA are not included in any restriction
					Principle 4: Construction noise events of
					 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unrest Development would be masked in these
					 Principle 6: Percussive piling or wor resulting in a noise level in excess of 69 receptor) should be avoided during the to March inclusive. The sensitive recep any SPA supporting habitat (e.g. high tid
					Adoption of Principle 1 (and reference to Pr adverse effects on those SWBGS sites that above (as these sites will not be subject to are used by SPA birds), and effects of noise <u>disturbance</u> on birds within the SPA itself.
					Trenching / road saw noise at 69dbLAmax h SWBGS sites. However, SWBGS sites P54 affected due to the minimal overlap of the si from trenching / road saw works. It is also c situated between the construction works and the noise so that in reality, there will be no c consequence, these two sites are excluded remaining 12 sites in addition to adjacenet of is considered likely that Principle 5 applies in construction work is restricted during Octob



annot take place in SWBGS (those upport, secondary support, low use or Proposed Developments Order Limits in is the gravel car park within site P11 s of cars, lorries and plant, and offers no or other waterbirds associated with PA.

take place underneath the SWBGS site pacts are considered to occur and the

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. Noise levels from the Proposed se instances.

orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October eptor is the nearest point of the SPA or tide roosting site).

Principle 2) will ensure that there are no at lie within the Order Limits as detailed works in the winter period when they se and <u>visual</u>

a has the potential to affect fourteen 4 and P29 will not be adversely site areas with noise exceeding 69 dB considered that the buildings that are nd SWBGS sites will effectively buffer overlap of noise effects. In d from the restriction. In relation to the <u>adjacent</u> areas of the SPA, although it is in this highly urbanised environment, ber – March.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	-				The percussive activities at HDD compound are anticipated to comprise the insertion of s vibrator at HDD-1, HDD-2, HDD-3 and HDD reception pit at HDD-4.
					In accordance with the requirements of the of high around the perimeter of the HDD comp noise mitigation. Example screening solution <u>OOCEMP (APP-505 Rev004)</u> . The benefit the included in 3D noise modelling for the HDD sites. Construction noise at over 69db LAma occurs outside of the compounds for HDD-4
					The SPA is in an urban setting and recent red disturbance does not have a significant impa- to conurbations (Goss-Custard <i>et al.</i> , 2019). HDD compounds will however also reduce w levels regardless of the baseline environment
					With the combination of the seasonal restric the potential effects on dark-bellied brent go displacement from the Proposed Developme effect on site integrity.
					Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve considered to be localised and temporary.
					The North Portsea Island Coastal Flood Def Between Milton Common and Kendall's Wha includes a full winter working restriction (Oct dark-bellied brent goose. Such restrictions I projects identified as potentially affecting wir SWBGS as outlined in Appendices 16.15 an APP-424). Potential overlap between the Pr and mitigation areas for the North Portsea Is Phase 4b would occur if the Proposed Deve around Milton Common is taken. However, t form part of the proposed mitigations/compe
					connection with the planning permission with most recent documents submitted to dischar
					As such, it is considered that there is no pot integrity from disturbance and displacement other project and plans (for full details see A integrity matrices for the SPA and Appendix



nds in proximity to the SWBGS sites f sheet piles via an excavator mounted D-6 and via a piling rig for the

e OOCEMP, screening of at least 2 m pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been D works in proximity to the SWBGS nax as a result of this screening only -4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close 0). The screening at the perimeter of e visual disturbance to indistinguishable ent.

iction and noise mitigation measures poose resulting from disturbance and nent alone will not result in an adverse

plans or projects which have temporal elopment (APP-423 and APP-424) are

efence Scheme, Phase 4B - Coastline harf Eastern Road (19/01368/FUL) ctober – March) so will not disturb s have been adopted by other plans or vintering bird features of the SPA or and 16.16 of the ES (APP-423 and Proposed Development Order Limits Island Coastal Flood Defence Scheme velopments southern route option , those compensation measures do not bensations to be provided in ith reference 19/01368/FUL as per the arge the relevant planning conditions.

otential for adverse effects on site nt, either alone or in combination with Appendix 1 for the screening and ix 5 for the Ramsar site).

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
		Accidental spills and Litter	Supporting habitat: food availability	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.	Unplanned oil or chemical spillages may occ decommissioning phases. Spills have the po- brent geese utilising intertidal and other sup Unplanned disposal of industrial or user plas decommissioning phases also has the poter goose mortality through ingestion or entang measures of standard best practice in terms prevention measures (see Chapter 27: Was APP-142)) will ensure that these events are result in an adverse effect. Measures details the Onshore Outline CEMP (APP-505 Revo Materials Management Plan ('MMP') and Si ('SWMP'). The key matters of the SWMP ar
					 Identify the volume of waste streams like establish the potential for reuse and recy
					Identify possible options for waste to be
					Identify opportunities for waste minimisa
					 Identify the most significant opportunit rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling
					Best practice recommendations for the prevoutlined in more detail in a detailed CEMP s and agreed with relevant authority prior to c Measures detailed in Chapter 19: Groundward in the Onshore Outline CEMP (APP-505 Reference)
					Designated areas for the storage of haza
					 On-site availability of oil spill clean-up er and inflatable booms for use in the even
					Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering th
					Therefore, it is considered that potential efference resulting from accidental spills and/or litter frequencies will not result in an adverse effect on a



beccur during the construction and potential to directly affect dark-bellied apporting habitats resulting in mortality. lastic during construction and ential to cause dark-bellied brent aglement. However, routine mitigation ns of waste management, pollution aste and Material Resources of the ES re prevented and will therefore not illed in Chapter 27 are summarised in <u>v002Rev004</u>) and detail incorporating a Site Waste Management Plan are to:

kely to be produced during the works to cycling;

e 'designed out;

sation and management;

ities to increase re-use and recycling

contractors and record appropriate as and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative

evention of contamination will be specific to the works to be undertaken commencement of construction works. water (APP-134) and further captured ev002<u>Rev004</u>) include:

zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse.

fects on dark-bellied brent goose from the Proposed Development is site integrity.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be locali Given the requirement to adhere to similar to contribute to in combination effects, it is con adverse effects on site integrity from accide combination with other project and plans (for screening and integrity matrices for the SPA site).
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 considered to be of high sensit 2013). Therefore, the presence of construct Langstone Harbour may disturb redshank at components of their daily cycle. This specie intertidal areas of the Study Area, most durin Furthermore, given the proximity of these arris considered that construction and decomm wintering redshank from favoured foraging a unpredictable noise events. However, the P industrialised setting so that any noise effect conditions. Other than where HDD routes un not coincide with the SPA itself. Furthermore Chichester and Langstone Harbour SPA and community will be avoided by restricting wor as October to March (the period when SPA their breeding grounds (Snow and Perrins, A detailed overview of the working restriction Onshore Ecology (APP-131) and Appendix features of Chichester & Langstone Harbour to revision following consultation with Natura updated Outline Onshore Construction Envi (OOCEMP; APP-505 Rev002 Rev004). Redshabitat only during the surveys undertaken f Therefore Principles 3– 6 apply to this speciel Principle 4: Construction noise events of the SPA are not included in any restriction.



plans or projects which have temporal velopment (APP-423 and APP-424)) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.

best practice measures which could onsidered that there is no potential for lental spills and litter, either alone or in for full details see Appendix 1 for the PA and Appendix 5 for the Ramsar

sitivity to disturbance (Cutts et al., ction associated with HDD works in at both roosting and foraging ies was recorded on a monthly basis in ring low tide surveys (APP-421). areas to the Proposed Development, it missioning works may displace and roosting habitat through Proposed Development is within an ects would not add to baseline underlie the SPA, the Order Limits do ore, effects of the construction stage on nd its wintering intertidal bird orks within the winter season, defined A birds such as redshank arrive from 1998).

ion was provided in Chapter 16: x 16.14: Winter Working Restriction for burs SPA (APP-422) and then subject ural England which are captured in the vironmental Monitoring Plan edshank was recorded in intertidal in for the Proposed Development. ecies:

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	-				 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unrestri from the Proposed Development would be
					 Principle 6: Percussive piling or work resulting in a noise level in excess of 690 receptor) should be avoided during the b to March inclusive. The sensitive recept any SPA supporting habitat (e.g. high tid
					Adoption of these principles will ensure that noise-and-, vibration and visual disturbance of effects from both trenching / road saw and H extremely limited with regards to intertidal has construction is restricted along Eastern Road sites so this section will also not provide any habitat within the SPA. The only other section Principle 6 is the section of the Onshore Cat the P23B SWBGS. These aspects are captur 505 <u>Rev002Rev004</u>).
					In accordance with the requirements of the C
					high around the perimeter of the HDD compo
					noise mitigation. Example screening solution
					OOCEMP (APP-505 Rev004). The benefit th
					included in 3D noise modelling for the HDD
					sites. Construction noise at over 69db LAma occurs outside of the compounds for HDD-4
					occurs outside of the compounds for HDD-4
					The SPA is in an urban setting and recent red disturbance does not have a significant impa- to conurbations (Goss-Custard <i>et al.</i> , 2019).
					HDD compounds will however also reduce v
					levels regardless of the baseline environmer
					0
					Therefore, it is considered that potential effe disturbance and displacement from the Prop result in an adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Devel considered to be localised and temporary.
					The North Portsea Island Coastal Flood Defe Between Milton Common and Kendall's Wha includes a full winter working restriction (Oct



 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October ptor is the nearest point of the SPA or ide roosting site).

at there are no adverse effects of from on redshank within the SPA. Noise HDD works overlaps at 69dbLAmax is habitat. Trenching / road saw had because of overlap with SWBGS hy disturbance to adjacent intertidal tion of the route that is restricted by able Route from Milton Locks north to tured in the revised OOCEMP (APP-

e OOCEMP, screening of at least 2 m pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been O works in proximity to the SWBGS nax as a result of this screening only -4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close (). The screening at the perimeter of visual disturbance to indistinguishable ent.

fects on redshank resulting from posed Development alone will not

plans or projects which have temporal elopment (APP-423 and APP-424) are

efence Scheme, Phase 4B - Coastline harf Eastern Road (19/01368/FUL) ctober – March) so will not disturb

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					redshank. Such restrictions have been adop identified as potentially affecting wintering bi as outlined in Appendices 16.15 and 16.16 of Potential overlap between the Proposed Deve mitigation areas for the North Portsea Island Phase 4b would occur if the Proposed Deve around Milton Common is taken. However, t form part of the proposed mitigations/compe connection with the planning permission with most recent documents submitted to dischar
					As such, it is considered that there is no pote integrity from disturbance and displacement other project and plans (for full details see A integrity matrices for the SPA and Appendix
		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,</i> <i>Corophium, Nereis</i>) at preferred sizes.	 Unplanned oil or chemical spillages may occord decommissioning phases. Spills have the poputilising intertidal and other supporting habital disposal of industrial or user plastic during comphases also has the potential to cause redshentanglement. However, routine mitigation in terms of waste management, pollution prever Waste and Material Resources of the ES AF are prevented and will therefore not result in detailed in Chapter 27 are summarised in the Rev002<u>Rev004</u>) and detail incorporating a Management Plan ('SWMP') to: Identify the volume of waste streams like establish the potential for reuse and recy Identify possible options for waste to be
					 Identify opportunities for waste minimisa Identify the most significant opportuniti rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling.



opted by other plans or projects bird features of the SPA or SWBGS, of the ES (APP-423 and APP-424). evelopment Order Limits and nd Coastal Flood Defence Scheme velopments southern route option , those compensation measures do not bensations to be provided in ith reference 19/01368/FUL as per the arge the relevant planning conditions.

otential for adverse effects on site nt, either alone or in combination with Appendix 1 for the screening and ix 5 for the Ramsar site).

ccur during the construction and potential to directly affect redshank itats resulting in mortality. Unplanned construction and decommissioning shank mortality through ingestion or measures of standard best practice in vention measures (see Chapter 27: APP-142)) will ensure that these events in an adverse effect. Measures the Onshore Outline CEMP (APP-505 Materials Management Plan ('MMP') P'). The key matters of the SWMP are

kely to be produced during the works to cycling;

e 'designed out;

ation and management;

ities to increase re-use and recycling

t contractors and record appropriate es and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative g.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Best practice recommendations for the preve outlined in more detail in a detailed CEMPsp be undertaken and agreed with relevant sta commencement of construction works. Meas Groundwater (APP-134) and further capture (APP-505 Rev002)Rev004) include: • Designated areas for the storage of haza
					On-site availability of oil spill clean-up ec
					and inflatable booms for use in the even
					Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering the
					Therefore, it is considered that potential effe accidental spills and/or litter from the Propos in an adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Devel plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ken (19/01368/FUL), are considered to be localis
					Given the requirement to adhere to similar b contribute to in combination effects, it is con- adverse effects on site integrity from accider combination with other project and plans (se integrity matrices for the SPA and Appendix
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 to be of high sensitive 2013). Therefore, the presence of construction Langstone Harbour may disturb shelduck at components of their daily cycle. This species intertidal areas of the Study Area during sur- Development, with highest numbers recorded (ES Appendix 16.13). Given the proximity of Development, it is considered that construct displace wintering shelduck from favoured for unpredictable noise events. However, the Pri industrialised setting so that the noise effects conditions. Other than where HDD routes up not coincide with the SPA itself. Furthermore Chichester and Langstone Harbour SPA and community will be avoided by restricting wor as October to March (the period when SPA I their breeding grounds (Snow and Perrins, 1



evention of contamination will be specific <u>CEMP specific</u> to the works to tatutory authority prior to asures detailed in Chapter 19: red in the Onshore Outline CEMP

zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse.

fects on redshank resulting from osed Development alone will not result

plans or projects which have temporal relopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road ilised and temporary.

best practice measures which could onsidered that there is no potential for ental spills and litter, either alone or in see Appendix 1 for the screening and ix 5 for the Ramsar site). tivity to disturbance (Cutts et al., ction associated with HDD works in at both roosting and foraging es was recorded on a monthly basis in rveys conducted for the Proposed ded at low tide (up to 66 individuals) of these areas to the Proposed ction and decommissioning works may foraging and roosting habitat through Proposed Development is within an cts would not add to baseline underlie the SPA, the Order Limits do re, effects of the construction stage on nd it's wintering intertidal bird orks within the winter season, defined A birds such as shelduck arrive from 1998).

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint of Chichester & Langstone Harbours SPA (A following consultation with Natural England Outline Onshore Construction Environmenta 505 Rev002 <u>Rev004</u>). Shelduck was recorded surveys undertaken for the Proposed Devel species:
					 Principle 3: Elements of the Onshore Ontext the SPA are not included in any restriction
					Principle 4: Construction noise events
					 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unresta from the Proposed Development would
					 Principle 6: Percussive piling or wor resulting in a noise level in excess of 69 receptor) should be avoided during the to March inclusive. The sensitive recep any SPA supporting habitat (e.g. high tid
					Adoption of these principles will ensure that fromnoise and vibration from noise, vibration within the SPA. Noise effects from both tren overlaps at 69dbLAmax is extremely limited Trenching / road saw construction is restrict overlap with SWBGS sites so this section w adjacent intertidal habitat. The only other se Principle 6 is the section of the Onshore Ca the P23B SWBGS.
					In accordance with the requirements of the high around the perimeter of the HDD comp noise mitigation. Example screening solution OOCEMP (APP-505 Rev004). The benefit to included in 3D noise modelling for the HDD sites. Construction noise at over 69db LAma occurs outside of the compounds for HDD-4
					The SPA is in an urban setting and recent red disturbance does not have a significant imp to conurbations (Goss-Custard <i>et al.</i> , 2019)



ion was provided in Chapter 16: inter Working Restriction for Features (APP-422) and then subject to revision d which are captured in the updated ntal Monitoring Plan (OOCEMP; APPded in intertidal habitat only during the elopment. Principles 3– 6 apply to this

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels d be masked in these instances.

orks with heavy machinery (i.e. plant i9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October eptor is the nearest point of the SPA or tide roosting site).

at there are no adverse effects <u>ionand visual disturbance</u> on shelduck enching / road saw and HDD works ed with regards to intertidal habitat. cted along Eastern Road because of will also not provide any disturbance to section of the route that is restricted by Cable Route from Milton Locks north to

e OOCEMP, screening of at least 2 m pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been works in proximity to the SWBGS nax as a result of this screening only -4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close). The screening at the perimeter of

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					HDD compounds will however also reduce version levels regardless of the baseline environme
					Therefore, it is considered that potential effective disturbance and displacement from the Propresult in an adverse effect on site integrity. Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve considered to be localised and temporary.
					The North Portsea Island Coastal Flood Det Between Milton Common and Kendall's Wh includes a full winter working restriction (Oc shelduck. Such restrictions have been adop identified as potentially affecting wintering b as outlined in Appendices 16.15 and 16.16 Potential overlap between the Proposed De mitigation areas for the North Portsea Island Phase 4b would occur if the Proposed Deve around Milton Common is taken. However, form part of the proposed mitigations/compe connection with the planning permission wit most recent documents submitted to dischar As such, it is considered that there is no pot integrity from disturbance and displacement other project and plans (for full details see A integrity matrices for the SPA and Appendix
		Accidental spills and Litter	Supporting habitat: –costal and food availability	Maintain the distribution, abundance and availability of key food and prey items e.g. <i>Hydrobia, Corophium, Nereis</i> , hatching midges) at preferred sizes.	 Unplanned oil or chemical spillages may occept decommissioning phases. Spills have the pertuilising intertidal and other supporting habits disposal of industrial or user plastic during of phases also has the potential to cause shell entanglement. However, routine mitigation meterms of waste management, pollution prever Waste and Material Resources of the ES AF are prevented will therefore not result in an Chapter 27 are summarised in the Onshore Rev002Rev004) and detail incorporating a fand Site Waste Management Plan ('SWMP' to: Identify the volume of waste streams like establish the potential for reuse and rect



<u>e visual disturbance to indistinguishable</u> <u>nent.</u>

ffects on shelduck resulting from roposed Development alone will not

plans or projects which have temporal velopment (APP-423 and APP-424) are

Defence Scheme, Phase 4B - Coastline /harf Eastern Road (19/01368/FUL) October – March) so will not disturb opted by other plans or projects bird features of the SPA or SWBGS, 6 of the ES (APP-423 and APP-424). Development Order Limits and and Coastal Flood Defence Scheme velopments southern route option r, those compensation measures do not opensations to be provided in with reference 19/01368/FUL as per the harge the relevant planning conditions.

ootential for adverse effects on site ent, either alone or in combination with Appendix 1 for the screening and dix 5 for the Ramsar site).

boccur during the construction and potential to directly affect shelduck bitats resulting in mortality. Unplanned g construction and decommissioning elduck mortality through ingestion or in measures of standard best practice in evention measures (see Chapter 27: APP-142)) will ensure that these events in adverse effect. Measures detailed in re Outline CEMP (APP-505 a Materials Management Plan ('MMP') IP'). The key matters of the SWMP are

ikely to be produced during the works to ecycling;

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Identify possible options for waste to be
					Identify opportunities for waste minimisa
					 Identify the most significant opportuniti rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling.
					Best practice recommendations for the preve outlined in more detail in a detailed CEMP s and agreed with relevant statutory consulted construction works. Measures detailed in Ch and further captured in the Onshore Outline include:
					Designated areas for the storage of haza
					On-site availability of oil spill clean-up ec and inflatable booms for use in the even
					• Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering the
					Therefore, it is considered that potential effe accidental spills and/or litter from the Proposi in an adverse effect on site integrity. Potential effects resulting from the limited pla and spatial overlap with the Proposed Devel plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ken (19/01368/FUL), are considered to be localis
					Given the requirement to adhere to similar b contribute to in combination effects, it is con adverse effects on site integrity from accider combination with other project and plans (se integrity matrices for the SPA and Appendix
Pintail	Maintaining or restoring the populations of qualifying features, and the distribution of	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting	Pintail is considered to be of moderate sens presence of construction associated with HE disturb pintail at both roosting and foraging of species was recorded on the majority of low



- e 'designed out;
- sation and management;
- ities to increase re-use and recycling
- t contractors and record appropriate es and hazardous waste consignment
- ch as how materials will be segregated raising awareness among site operative ng.
- evention of contamination will be specific to the works to be undertaken ees prior to commencement of Chapter 19: Groundwater (APP-134) the CEMP (APP-505 Rev002<u>Rev004</u>)
- zardous materials, fuels and chemicals;
- equipment including absorbent material ent of an oil spill or leak;
- nd
- he watercourse.
- fects on shelduck resulting from osed Development alone will not result
- plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.
- best practice measures which could onsidered that there is no potential for lental spills and litter, either alone or in see Appendix 1 for the screening and ix 5 for the Ramsar site).
- Isitivity to disturbance. Therefore, the IDD works in Langstone Harbour may components of their daily cycle. This w tide surveys conducted for the

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
	qualifying features within the site.			and/or loafing birds so that they are not significantly disturbed.	 Proposed Development in intertidal areas of individuals were noted (APP-421). Given the Proposed Development, construction and de wintering pintail from favoured foraging and unpredictable noise events. However, the P industrialised setting so that the noise effect conditions. Other than where HDD routes u not coincide with the SPA itself. Furthermore Chichester and Langstone Harbour SPA and community will be avoided by restricting wor as October to March (the period when SPA breeding grounds (Snow and Perrins, 1998) A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint of Chichester & Langstone Harbours SPA (A following consultation with Natural England Outline Onshore Construction Environmenta 505 Rev002 Rev004). Pintail was recorded in surveys undertaken for the Proposed Developsecies: Principle 3: Elements of the Onshore Construction is any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA are not included in any restriction of the SPA area of
					 Principle 4: Construction noise events of Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unrestr from the Proposed Development would
					 Principle 6: Percussive piling or wor resulting in a noise level in excess of 69 receptor) should be avoided during the to March inclusive. The sensitive recep any SPA supporting habitat (e.g. high tic
					Adoption of these principles ensure that the and-vibration and visual disturbance on pints both trenching / road saw and HDD works o limited with regards to intertidal habitat. Tren restricted along Eastern Road because of or section will also not provide any disturbance only other section of the route that is restrict Onshore Cable Route from Milton Locks nor



of the Study Area where up to 75 he proximity of these areas to the decommissioning works may displace d roosting habitat through Proposed Development is within an cts would not add to baseline underlie the SPA, the Order Limits do ore, effects of the construction stage on nd its wintering intertidal bird orks within the winter season, defined A birds such as pintail arrive from their 8).

on was provided in Chapter 16: nter Working Restriction for Features (APP-422) and then subject to revision d which are captured in the updated tal Monitoring Plan (OOCEMP; APPin intertidal habitat only during the elopment. Principles 3– 6 apply to this

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October ptor is the nearest point of the SPA or ide roosting site).

ere are no adverse effects from noise ntail within the SPA. Noise effects from overlaps at 69dbLAmax is extremely enching / road saw construction is overlap with SWBGS sites so this ce to adjacent intertidal habitat. The cted by Principle 6 is the section of the orth to the P23B SWBGS.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					In accordance with the requirements of the thigh around the perimeter of the HDD comproise mitigation. Example screening solution OOCEMP (APP-505 Rev004). The benefit the included in 3D noise modelling for the HDD sites. Construction noise at over 69db LAma occurs outside of the compounds for HDD-4. The SPA is in an urban setting and recent redisturbance does not have a significant impart to conurbations (Goss-Custard <i>et al.</i> , 2019). HDD compounds will however also reduce to levels regardless of the baseline environme. Therefore, it is considered that potential effect disturbance and displacement from the Propresult in an adverse effect on site integrity. Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve considered to be localised and temporary. The North Portsea Island Coastal Flood Def Between Milton Common and Kendall's Whi includes a full winter working restriction (Oc pintail. Such restrictions have been adopted as potentially affecting wintering bird feature in Appendices 16.15 and 16.16 of the ES (A overlap between the Proposed Development for the North Portsea Island Coastal Flood Def Development is taken. However, those compens the proposed mitigations/compensations to planning permission with reference 19/0136 documents submitted to discharge the relevant of the ropiect and plans (for full details see A integrity matrices for the SPA and Appendix
		Accidental spills and Litter	Supporting habitat: –food availability	Maintain the distribution, abundance and availability of key food and prey items e.g. <i>Eleocharis palustris,</i>	Unplanned oil or chemical spillages may oc decommissioning phases. Spills have the po- utilising intertidal and other supporting habit disposal of industrial or user plastic during of phases also has the potential to cause pinta



e OOCEMP, screening of at least 2 m pounds is required for the purpose of ons are presented in plate 6.1 of the t this screening affords has been D works in proximity to the SWBGS max as a result of this screening only -4 and HDD-6.

t research has established that visual spact on waterbirds in an estuary close 9). The screening at the perimeter of e visual disturbance to indistinguishable spent.

ffects on pintail resulting from roposed Development alone will not

plans or projects which have temporal /elopment (APP-423 and APP-424) are

Defence Scheme, Phase 4B - Coastline /harf Eastern Road (19/01368/FUL) October – March) so will not disturb ed by other plans or projects identified ures of the SPA or SWBGS, as outlined (APP-423 and APP-424). Potential ent Order Limits and mitigation areas d Defence Scheme Phase 4b would hern route option around Milton ensation measures do not form part of to be provided in connection with the 368/FUL as per the most recent evant planning conditions.

ootential for adverse effects on site ent, either alone or in combination with Appendix 1 for the screening and dix 5 for the Ramsar site).

occur during the construction and potential to directly affect pintail bitats resulting in mortality. Unplanned g construction and decommissioning ntail mortality through ingestion or

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
				Potamogeton, Elodea, Rumex, Glyceria, Chara, hatching midges, insects, molluscs, crustaceans, Hydrobia, cereal grains and potatoes) at preferred sizes.	entanglement. However, routine mitigation m terms of waste management, pollution preve Waste and Material Resources of the ES AF are prevented and will therefore not result in detailed in Chapter 27 are summarised in th <u>Rev002) <u>Rev004</u> and detail incorporating a and Site Waste Management Plan ('SWMP' to:</u>
					 Identify the volume of waste streams like establish the potential for reuse and recy
					Identify possible options for waste to be
					Identify opportunities for waste minimisa
					 Identify the most significant opportuniti rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling
					Best practice recommendations for the prevolution outlined in more detail in a detailed CEMP s and agreed with relevant authority prior to complex detailed in Chapter 19: Groundward in the Onshore Outline CEMP (APP-505 Reference)
					Designated areas for the storage of haza
					 On-site availability of oil spill clean-up ec and inflatable booms for use in the even
					Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering th
					Therefore, it is considered that potential effe accidental spills and/or litter from the Propos in an adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Devel plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be localis



a measures of standard best practice in vention measures (see Chapter 27: APP-142) will ensure that these events in an adverse effect. Measures the Onshore Outline CEMP (APP-505 a Materials Management Plan ('MMP') P'). The key matters of the SWMP are

kely to be produced during the works to cycling;

e 'designed out;

ation and management;

ities to increase re-use and recycling

contractors and record appropriate as and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative g.

evention of contamination will be specific to the works to be undertaken commencement of construction works. water (APP-134) and further captured ev002<u>Rev004</u>) include:

zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

nd

he watercourse

fects on pintail resulting from osed Development alone will not result

plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Shoveler	Maintaining or restoring the populations of qualifying features, and	Disturbance and displacement	Disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting roosting,	Given the requirement to adhere to similar be contribute to in combination effects, it is con adverse effects on site integrity from acciden combination with other project and plans (se intregrity matrices for the SPA and Appendix Shoveler is considered to be of moderate set the presence of construction associated with may disturb shoveler at both roosting and for
	the distribution of qualifying features within the site.			foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.	cycle. This species was recorded during a s the Proposed Development where two indiv habitat (APP-421). Given the proximity of su Proposed Development, it is considered that works may displace wintering shoveler from unpredictable noise events, although it is ev are present. The Proposed Development is noise effects would not add to baseline con Other than where HDD routes underlie the S with the SPA itself. Furthermore, effects of th and Langstone Harbour SPA and its winterin avoided by restricting works within the winte March (the period when SPA birds such as s grounds (Snow and Perrins, 1998). A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint of Chichester & Langstone Harbours SPA (A following consultation with Natural England Outline Onshore Construction Environmenta 505 <u>Rev002Rev004</u>). Shoveler was recorde surveys undertaken for the Proposed Develop
					 Principle 3: Elements of the Onshore Cat SPA are not included in any restriction.
					• Principle 4: Construction noise events of
					 Principle 5: Construction works of 55 – 72 major road and/or adjacent to industrial existing noise can be undertaken unrestri- from the Proposed Development would be
					 Principle 6: Percussive piling or works with in a noise level in excess of 69dbLAmax should be avoided during the bird overwith



best practice measures which could onsidered that there is no potential for ental spills and litter, either alone or in see Appendix 1 for the screening and dix 5 for the Ramsar site).

sensitivity to disturbance. Therefore, ith HDD works in Langstone Harbour foraging components of their daily single low tide survey conducted for lividuals were noted on intertidal suitable habitat for this species to the at construction and decommissioning m favoured habitat through evident that only very small numbers

s within an industrialised setting so that onditions.

SPA, the Order Limits do not coincide the construction stage on Chichester ring intertidal bird community will be ter season, defined as October to s shoveler arrive from their breeding

on was provided in Chapter 16: nter Working Restriction for Features (APP-422) and then subject to revision d which are captured in the updated tal Monitoring Plan (OOCEMP; APPled in intertidal habitat only during the elopment. Principles 3– 6 apply to this

able Route that are over 400 m from the

of <55 dB can occur unrestricted.

72 dBLAmax immediately adjacent to a al sites with notable levels (>60 dB) of tricted. It is considered that noise levels be masked in these instances.

vith heavy machinery (i.e. plant resulting x – measured at the sensitive receptor) wintering period (i.e. October to March

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					inclusive. The sensitive receptor is the r
					supporting habitat (e.g. high tide roosting
					Adoption of these principles will ensure that
					noise and vibration and visual disturbance
					effects from both trenching / road saw and l extremely limited with regards to intertidal h
					construction is restricted along Eastern Roa
					sites so this section will also not provide any
					habitat. The only other section of the route t
					section of the Onshore Cable Route from M SWBGS.
					SWB03.
					In accordance with the requirements of the
					high around the perimeter of the HDD comp
					noise mitigation. Example screening solution OOCEMP (APP-505 Rev004). The benefit t
					included in 3D noise modelling for the HDD
					sites. Construction noise at over 69db LAm
					occurs outside of the compounds for HDD-4
					The SPA is in an urban setting and recent re
					disturbance does not have a significant imp
					to conurbations (Goss-Custard et al., 2019) HDD compounds will however also reduce
					levels regardless of the baseline environme
					Therefore, it is considered that potential effe
					disturbance and displacement from the Pro
					result in an adverse effect on site integrity.
					Potential effects resulting from the limited p and spatial overlap with the Proposed Deve
					considered to be localised and temporary.
					The North Portsea Island Coastal Flood De
					Between Milton Common and Kendall's Wh
					includes a full winter working restriction (Oc
					shoveler. Such restrictions have been adop
					identified as potentially affecting wintering b as outlined in Appendices 16.15 and 16.16
					Potential overlap between the Proposed De
					mitigation areas for the North Portsea Island
					Phase 4b would occur if the Proposed Deve
					around Milton Common is taken. However,
					form part of the proposed mitigations/compe



nearest point of the SPA or any SPA g site).

at there are no adverse effects from e on shoveler within the SPA. Noise HDD works overlaps at 69dbLAmax is habitat. Trenching / road saw ad because of overlap with SWBGS by disturbance to adjacent intertidal that is restricted by Principle 6 is the Wilton Locks north to the P23B

<u>e OOCEMP, screening of at least 2 m</u> <u>pounds is required for the purpose of</u> <u>ons are presented in plate 6.1 of the</u> <u>this screening affords has been</u> <u>D works in proximity to the SWBGS</u> <u>nax as a result of this screening only</u> <u>-4 and HDD-6.</u>

research has established that visual pact on waterbirds in an estuary close b). The screening at the perimeter of visual disturbance to indistinguishable ent.

fects on shoveler resulting from posed Development alone will not

plans or projects which have temporal velopment (APP-423 and APP-424) are

efence Scheme, Phase 4B - Coastline harf Eastern Road (19/01368/FUL) october – March) so will not disturb pted by other plans or projects bird features of the SPA or SWBGS, of the ES (APP-423 and APP-424). evelopment Order Limits and nd Coastal Flood Defence Scheme velopments southern route option those compensation measures do not pensations to be provided in

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					connection with the planning permission wit most recent documents submitted to discha
					As such, it is considered that there is no po- integrity from disturbance and displacement other project and plans (for full details see A intregrity matrices for the SPA).
		Accidental spills and Litter	Supporting habitat: -food availability	Maintain the distribution, abundance and availability of key food and prey items e.g. <i>cirpus, Eleocharis, Carex,</i> <i>Potamogeton, Glyceria,</i> surface plankton, hatching midges, Hydrobia, crustaceans, caddisflies, diptera, beetles) at preferred sizes.	 Unplanned oil or chemical spillages may oc decommissioning phases. Spills have the p utilising intertidal and other supporting habit disposal of industrial or user plastic during of phases also has the potential to shoveler m entanglement. However, routine mitigation of terms of waste management, pollution prev. Waste and Material Resources of the ES Al are preventedand will therefore not result in in Chapter 27 are summarised in the Onsho Rev002)Rev004) and detail incorporating a and Site Waste Management Plan ('SWMP to: Identify the volume of waste streams like establish the potential for reuse and rec Identify possible options for waste to be Identify opportunities for waste minimisate Identify the most significant opportunit rates; Identify suitable waste management licences, permits, waste transfer notes notes; and Consider appropriate site practices such and the measures that will be used for ra- for waste reduction, reuse and recycling Best practice recommendations for the prev- outlined in more detail in a detailed CEMP s and agreed with relevant authority prior to co- Measures detailed in Chapter 19: Groundwa in the Onshore Outline CEMP (APP-505 Re-



vith reference 19/01368/FUL as per the narge the relevant planning conditions.

ootential for adverse effects on site ent, either alone or in combination with e Appendix 1 for the screening and

boccur during the construction and potential to directly affect shoveler bitats resulting in mortality. Unplanned g construction and decommissioning mortality through ingestion or n measures of standard best practice in evention measures (see Chapter 27: APP-142)) will ensure that these events in an adverse effect. Measures detailed hore Outline CEMP (APP-505 a Materials Management Plan ('MMP') IP'). The key matters of the SWMP are

ikely to be produced during the works to ecycling;

be 'designed out;

sation and management;

nities to increase re-use and recycling

t contractors and record appropriate es and hazardous waste consignment

uch as how materials will be segregated raising awareness among site operative ng.

evention of contamination will be P specific to the works to be undertaken o commencement of construction works. water (APP-134) and further captured Rev002<u>Rev004</u>) include:

zardous materials, fuels and chemicals.;

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 On-site availability of oil spill clean-up ec and inflatable booms for use in the even
					Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering the
					Therefore, it is considered that potential effe accidental spills and/or litter from the Proposi in an adverse effect on site integrity. Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be localist Given the requirement to adhere to similar be contribute to in combination effects, it is con adverse effects on site integrity from accide combination with other project and plans (se intregrity matrices for the SPA).
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 be of moderate sensiting presence of construction associated with HE disturb teal at both roosting and foraging consulthough it is evident from surveys conducted only very small numbers are present (APP-4 within an industrialised setting so that noise conditions. Other than where HDD routes underlie the S with the SPA itself. Furthermore, effects of the and Langstone Harbour SPA and its wintering avoided by restricting works within the winter March (the period when SPA birds such as the grounds (Snow and Perrins, 1998).
					A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint of Chichester & Langstone Harbours SPA (A following consultation with Natural England Outline Onshore Construction Environmenta 505 <u>Rev002Rev004</u>). Teal was recorded in surveys undertaken for the Proposed Develops species:



equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse

fects on shoveler resulting from osed Development alone will not result

plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.

best practice measures which could onsidered that there is no potential for ental spills and litter, either alone or in see Appendix 1 for the screening and

itivity to disturbance. Therefore, the IDD works in Langstone Harbour may omponents of their daily cycle. ted for the Proposed Development that -421). The Proposed Development lies e effects would not add to baseline

SPA, the Order Limits do not coincide the construction stage on Chichester ring intertidal bird community will be ter season, defined as October to s teal arrive from their breeding

on was provided in Chapter 16: nter Working Restriction for Features (APP-422) and then subject to revision d which are captured in the updated ntal Monitoring Plan (OOCEMP; APPn intertidal habitat only during the elopment. Principles 3– 6 apply to this

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Principle 3: Elements of the Onshore C the SPA are not included in any restriction
					Principle 4: Construction noise events o
					 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unrestri from the Proposed Development would be
					 Principle 6: Percussive piling or work resulting in a noise level in excess of 690 receptor) should be avoided during the b to March inclusive. The sensitive recept any SPA supporting habitat (e.g. high tid
					Adoption of these principles will ensure that noise-and visual disturbance of from both trenching / road saw and HDD wor extremely limited with regards to intertidal has construction is restricted along Eastern Road sites so this section will also not provide any habitat. The only other section of the route th section of the Onshore Cable Route from Mi SWBGS.
					In accordance with the requirements of the C
					high around the perimeter of the HDD compo
					noise mitigation. Example screening solution
					OOCEMP (APP-505 Rev004). The benefit th
					included in 3D noise modelling for the HDD
					sites. Construction noise at over 69db LAma
					occurs outside of the compounds for HDD-4
					The SPA is in an urban setting and recent re
					disturbance does not have a significant impa
					to conurbations (Goss-Custard et al., 2019).
					HDD compounds will however also reduce v
					levels regardless of the baseline environmer
					Therefore, it is considered that potential effe and displacement from the Proposed Develo adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Devel considered to be localised and temporary.



Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October ptor is the nearest point of the SPA or ide roosting site).

at there are no adverse effects from e on teal within the SPA. Noise effects vorks overlaps at 69dbLAmax is habitat. Trenching / road saw ad because of overlap with SWBGS ny disturbance to adjacent intertidal that is restricted by Principle 7 is the Vilton Locks north to the P23B

<u>e OOCEMP, screening of at least 2 m</u> pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been O works in proximity to the SWBGS max as a result of this screening only -4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close <u>(). The screening at the perimeter of</u> visual disturbance to indistinguishable ent.

fects on teal resulting from disturbance elopment alone will not result in an

plans or projects which have temporal elopment APP-423 and APP-424) are

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					The North Portsea Island Coastal Flood Def Between Milton Common and Kendall's What includes a full winter working restriction (Oct Such restrictions have been adopted by othe potentially affecting wintering bird features of Appendices 16.15 and 16.16 of the ES (APF overlap between the Proposed Development for the North Portsea Island Coastal Flood Development occur if the Proposed Developments souther Common is taken. However, those compenses the proposed mitigations/compensations to planning permission with reference 19/0136 documents submitted to discharge the relev As such, it is considered that there is no pot integrity from disturbance and displacement other project and plans (for full details see A intregrity matrices for the SPA and Appendix
		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,</i> <i>Ranunculus, Hydrobia</i> , flies, caddisfly, beetles, bugs, hatching midges) at preferred sizes.	 Unplanned oil or chemical spillages may occe decommissioning phases. Spills have the perintertidal and other supporting habitats result of industrial or user plastic during construction has the potential to cause teal mortality throod However, routine mitigation measures of state management, pollution prevention measures. Material sources of the ES APP-142) will entry and will therefore not result in an adverse effective 27 are summarised in the Onshore Outline of and detail incorporating a Materials Management Plan ('SWMP'). The key matter of the potential for reuse and recyses and recyses of the potential for reuse and recyses. Identify the volume of waste streams like establish the potential for waste to be Identify opportunities for waste minimisation. Identify the most significant opportunit rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and



efence Scheme, Phase 4B - Coastline harf Eastern Road (19/01368/FUL) ectober – March) so will not disturb teal. ther plans or projects identified as of the SPA or SWBGS, as outlined in PP-423 and APP-424). Potential ent Order Limits and mitigation areas Defence Scheme Phase 4b would hern route option around Milton nsation measures do not form part of be provided in connection with the 868/FUL as per the most recent evant planning conditions.

otential for adverse effects on site nt, either alone or in combination with Appendix 1 for the screening and dix 5 for the Ramsar site).

ccur during the construction and potential to directly affect teal utilising sulting in mortality. Unplanned disposal ction and decommissioning phases also rough ingestion or entanglement. standard best practice in terms of waste res (see Chapter 27: Waste and ensure that these events are prevented effect. Measures detailed in Chapter e CEMP (APP-505 <u>Rev002Rev004</u>) gement Plan ('MMP') and Site Waste tters of the SWMP are to:

kely to be produced during the works to cycling;

e 'designed out;

ation and management;

ities to increase re-use and recycling

contractors and record appropriate es and hazardous waste consignment

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Consider appropriate site practices such and the measures that will be used for ration waste reduction, reuse and recycling. Best practice recommendations for the prevoutlined in more detail in a detailed CEMP is and agreed with relevant authority prior to compare the Onshore Outline CEMP (APP-505 Revolution). Designated areas for the storage of haza On-site availability of oil spill clean-up eration inflatable booms for use in the event. Use of drip trays under mobile plant; and Drain socks to trap sediment entering the Therefore, it is considered that potential effects adverse effect on site integrity. Potential effects resulting from the limited pland spatial overlap with the Proposed Developed and spatial overlap with the Proposed Developies the North Portsea Island Coastal Flood Coastline Between Milton Common and Ket (19/01368/FUL), are considered to be localities for the requirement to adhere to similar the contribute to in combination effects, it is complication with other project and plans (see intregrity matrices for the SPA and Appendition)
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 to be of moderate ser presence of construction associated with HI disturb wigeon. This species was however us Study Area during surveys conducted for the Given the proximity however of suitable has Development, construction and decommissis wigeon through unpredictable noise events, very small numbers are present. The Propo- industrialised setting so that noise effects w Other than where HDD routes underlie the S with the SPA itself. Furthermore, effects of t and Langstone Harbour SPA and its winteri avoided by restricting works within the winter March (the period when SPA birds such as grounds (Snow and Perrins, 1998).



uch as how materials will be segregated raising awareness among site operative ng.

evention of contamination will be P specific to the works to be undertaken o commencement of construction works. ater (APP-134)and further captured in v002<u>Rev004</u>) include:

azardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

and

the watercourse

ffects on teal resulting from accidental elopment alone will not result in an

plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B -Cendall's Wharf Eastern Road alised and temporary.

r best practice measures which could onsidered that there is no potential for dental spills and litter, either alone or in (see Appendix 1 for the screening and dix 5 for the Ramsar site).

ensitivity to disturbance. Therefore, the HDD works in Langstone Harbour may r unrecorded in intertidal areas of the the Proposed Development (APP-421). abitat for this species to the Proposed ssioning works may displace wintering ts, although it is evident that at most, posed Development lies within an s would not add to baseline conditions. e SPA, the Order Limits do not coincide of the construction stage on Chichester ering intertidal bird community will be ner season, defined as October to as wigeon arrive from their breeding

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint Chichester & Langstone Harbours SPA (AP following consultation with Natural England Outline Onshore Construction Environmenta 505 <u>Rev002Rev004</u>). Those relevant to wigh
					 Principle 3: Elements of the Onshore 0 the SPA are not included in any restriction
					Principle 4: Construction noise events of
					 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unresta from the Proposed Development would
					 Principle 6: Percussive piling or wor resulting in a noise level in excess of 69 receptor) should be avoided during the to March inclusive. The sensitive recep any SPA supporting habitat (e.g. high tid
					Adoption of these principles ensure that the <u>from noise</u> , vibration <u>and visual disturbance</u> effects from both trenching / road saw and H extremely limited with regards to intertidal h construction is restricted along Eastern Roa sites so this section will also not provide any habitat. The only other section of the route the section of the Onshore Cable Route from M SWBGS.
					In accordance with the requirements of the high around the perimeter of the HDD comp noise mitigation. Example screening solution OOCEMP (APP-505 Rev004). The benefit to included in 3D noise modelling for the HDD sites. Construction noise at over 69db LAma occurs outside of the compounds for HDD-4
					The SPA is in an urban setting and recent red disturbance does not have a significant imper- to conurbations (Goss-Custard <i>et al.</i> , 2019)



on was provided in Chapter 16: nter Working Restriction for features of PP-422) and then subject to revision d which are captured in the updated ntal Monitoring Plan (OOCEMP; APPgeon are Principles 3-6:

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October ptor is the nearest point of the SPA or ide roosting site).

ere is no adverse effect fromnoise and e on wigeon within the SPA. Noise HDD works overlaps at 69dbLAmax is habitat. Trenching / road saw ad because of overlap with SWBGS hy disturbance to adjacent intertidal that is restricted by Principle 6 is the Wilton Locks north to the P23B

<u>e OOCEMP, screening of at least 2 m</u> pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been D works in proximity to the SWBGS nax as a result of this screening only -4 and HDD-6.

<u>research has established that visual</u> <u>pact on waterbirds in an estuary close</u>)). The screening at the perimeter of

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					HDD compounds will however also reduce levels regardless of the baseline environme
					Therefore, it is considered that potential efference and displacement from the Propresult in an adverse effect on site integrity.
					Potential effects resulting from the limited p and spatial overlap with the Proposed Deve considered to be localised and temporary.
					The North Portsea Island Coastal Flood De Between Milton Common and Kendall's Wh includes a full winter working restriction (Oc wigeon. Such restrictions have been adopte as potentially affecting wintering bird feature in Appendices 16.15 and 16.16 of the ES (A overlap between the Proposed Development for the North Portsea Island Coastal Flood I occur if the Proposed Developments southe Common is taken. However, those compen- the proposed mitigations/compensations to planning permission with reference 19/0136 documents submitted to discharge the relev As such, it is considered that there is no pot- integrity from disturbance and displacement other project and plans (for full details see A intregrity matrices for the SPA.
		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 chemical spillages may oc decommissioning phases. Spills have the putilising intertidal and other supporting habit disposal of industrial or user plastic during of phases also has the potential to cause wige entanglement. However, routine mitigation near terms of waste management, pollution preverwaste and Material Resources of the ES Al are prevented and will therefore not result in detailed in Chapter 27 are summarised in the Rev002<u>Rev004</u>) and detail incorporating a l and Site Waste Management Plan ('SWMP to: Identify the volume of waste streams like establish the potential for reuse and recommendation.



<u>e visual disturbance to indistinguishable</u> <u>nent.</u>

ffects on wigeon resulting from roposed Development alone will not

plans or projects which have temporal velopment (APP-423 and APP-424) are

Defence Scheme, Phase 4B - Coastline /harf Eastern Road (19/01368/FUL) October – March) so will not disturb oted by other plans or projects identified ures of the SPA or SWBGS, as outlined (APP-423 and APP-424). Potential ent Order Limits and mitigation areas d Defence Scheme Phase 4b would hern route option around Milton ensation measures do not form part of to be provided in connection with the 368/FUL as per the most recent evant planning conditions.

ootential for adverse effects on site ent, either alone or in combination with Appendix 1 for the screening and

beccur during the construction and potential to directly affect wigeon bitats resulting in mortality. Unplanned g construction and decommissioning geon mortality through ingestion or n measures of standard best practice in evention measures (see Chapter 27: APP-142) will ensure that these events t in an adverse effect. Measures the Onshore Outline CEMP (APP-505 a Materials Management Plan ('MMP') IP'. The key matters of the SWMP are

ikely to be produced during the works to ecycling;

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Identify possible options for waste to be
					Identify opportunities for waste minimisa
					 Identify the most significant opportunit rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling
					Best practice recommendations for the prevolution outlined in more detail in a detailed CEMP s and agreed with relevant authority prior to compass detailed in Chapter 19: Groundward in the Onshore Outline CEMP (APP-505 Reference)
					Designated areas for the storage of haza
					On-site availability of oil spill clean-up example and inflatable booms for use in the even
					• Use of drip trays under mobile plant; and
					Drain socks to trap sediment entering th
					Therefore, it is considered that potential effe accidental spills and/or litter from the Propos in an adverse effect on site integrity. Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be localis
					Given the requirement to adhere to similar be contribute to in combination effects, it is con adverse effects on site integrity from accide combination with other project and plans (se intregrity matrices for the SPA).
Bar-tailed godwit	Maintaining or restoring the populations of qualifying features, and the distribution of	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	Bar-tailed godwit is considered to be of mod Therefore, the presence of construction ass Harbour may disturb this species. This spec occasion only (of a single individual) in inter surveys conducted for the Proposed Develo



- e 'designed out;
- sation and management;
- ities to increase re-use and recycling
- t contractors and record appropriate es and hazardous waste consignment
- ch as how materials will be segregated raising awareness among site operative ng.
- evention of contamination will be specific to the works to be undertaken commencement of construction works. water (APP-134) and further captured ev002<u>Rev004</u>) include:
- zardous materials, fuels and chemicals;
- equipment including absorbent material ent of an oil spill or leak;
- nd
- the watercourse
- fects on wigeon resulting from osed Development alone will not result
- plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.
- best practice measures which could posidered that there is no potential for ental spills and litter, either alone or in see Appendix 1 for the screening and
- oderate sensitivity to disturbance. sociated with HDD works in Langstone ecies was recorded on a single ertidal areas of the Study Area during lopment (APP-421). Given the

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives qualifying features within the site.	Effect		Target they are not significantly disturbed.	 Assessment proximity however of suitable habitat for this Development, it is considered that construct displace wintering bar-tailed godwit through it is evident that only very small numbers are Development is however within an industrial would not add to baseline conditions. Other SPA, the Order Limits do not coincide with t the construction stage on Chichester and La wintering intertidal bird community will be av winter season, defined as October to March bar-tailed godwit arrive from their breeding of A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint of Chichester & Langstone Harbours SPA (<i>I</i> following consultation with Natural England Onshore OCEMP; APP-505 Rev002Rev004 which was only recorded utilising intertidal h Principle 3: Elements of the Onshore O the SPA are not included in any restriction Principle 5: Construction noise events of Principle 5: Construction noise events of Principle 6: Percussive piling or worf resulting in a noise level in excess of 69 receptor) should be avoided during the H to March inclusive. The sensitive reception any SPA supporting habitat (e.g. high tic Adoption of these principles will ensure that fromnoise and from noise_vibration and visit within the SPA. Noise effects from both tren overlaps at 69dbLAmax is extremely limited Trenching / road saw construction is restrict overlap with SWBGS sites so this section wi adjacent intertidal habitat. The only other se Principle 6 is the section of the Onshore Cal the P23B SWBGS.



is species to the Proposed ction and decommissioning works may h unpredictable noise events, although are present. The Proposed alised setting so that noise effects er than where HDD routes underlie the the SPA itself. Furthermore, effects of Langstone Harbour SPA and its avoided by restricting works within the ch (the period when SPA birds such as g grounds (Snow and Perrins, 1998).

tion was provided in Chapter 16: nter Working Restriction for Features (APP-422) and then subject to revision d which are captured in the updated <u>04</u>). Those relevant to bar-tailed godwit habitat are Principles 3-6:

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant i9dbLAmax – measured at the sensitive bird overwintering period (i.e. October eptor is the nearest point of the SPA or tide roosting site).

at there are no adverse effects sual disturbance on bar-tailed godwit enching / road saw and HDD works ed with regards to intertidal habitat. cted along Eastern Road because of will also not provide any disturbance to section of the route that is restricted by cable Route from Milton Locks north to

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					In accordance with the requirements of the (
					high around the perimeter of the HDD comp
					noise mitigation. Example screening solution OOCEMP (APP-505 Rev004). The benefit the
					included in 3D noise modelling for the HDD
					sites. Construction noise at over 69db LAma
					occurs outside of the compounds for HDD-4
					•
					The SPA is in an urban setting and recent re
					disturbance does not have a significant impa
					to conurbations (Goss-Custard et al., 2019).
					HDD compounds will however also reduce v
					levels regardless of the baseline environme
					Therefore, it is considered that potential effe
					from disturbance and displacement from the not result in an adverse effect on site integri
					•
					Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve
					considered to be localised and temporary.
					The North Portsea Island Coastal Flood Def Between Milton Common and Kendall's Wh
					includes a full winter working restriction (Oc
					tailed godwit. Such restrictions have been a
					identified as potentially affecting wintering b
					as outlined in Appendices 16.15 and 16.16
					Potential overlap between the Proposed De
					mitigation areas for the North Portsea Island
					Phase 4b would occur if the Proposed Deve
					around Milton Common is taken. However, t
					form part of the proposed mitigations/competence connection with the planning permission wit
					most recent documents submitted to discha
					As such, it is considered that there is no pot
					integrity from disturbance and displacement
					other project and plans (for full details see A
					intregrity matrices for the SPA.
		Accidental	Supporting		Unplanned oil or chemical spillages may oc
		spills and	habitat: food	Maintain the distribution,	decommissioning phases. Spills have the po
		Litter	availability	abundance and availability of	godwit utilising intertidal and other supportin
			,	key food and prey items e.g.	Unplanned disposal of industrial or user plas
					decommissioning phases also has the poter



e OOCEMP, screening of at least 2 m pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been O works in proximity to the SWBGS max as a result of this screening only -4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close). The screening at the perimeter of e visual disturbance to indistinguishable ent.

fects on bar-tailed godwit resulting ne Proposed Development alone will rity.

plans or projects which have temporal elopment (APP-423 and APP-424) are

efence Scheme, Phase 4B - Coastline harf Eastern Road (19/01368/FUL) ctober – March) so will not disturb baradopted by other plans or projects bird features of the SPA or SWBGS, of the ES (APP-423 and APP-424). evelopment Order Limits and nd Coastal Flood Defence Scheme velopments southern route option , those compensation measures do not bensations to be provided in ith reference 19/01368/FUL as per the arge the relevant planning conditions.

otential for adverse effects on site nt, either alone or in combination with Appendix 1 for the screening and

ccur during the construction and potential to directly affect bar-tailed ing habitats resulting in mortality. astic during construction and ential to cause bar-tailed godwit

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
				Arenicola, Nereis) at preferred sizes.	mortality through ingestion or entanglement. measures of standard best practice in terms prevention measures (see Chapter 27: Wast APP-142)) will ensure that these events are result in an adverse effect. Measures detaile the Onshore Outline CEMP (APP-505 Revol Materials Management Plan ('MMP') and Sit ('SWMP'). The key matters of the SWMP are
					 Identify the volume of waste streams like establish the potential for reuse and recy
					Identify possible options for waste to be
					Identify opportunities for waste minimisat
					 Identify the most significant opportunition rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for rais for waste reduction, reuse and recycling.
					Best practice recommendations for the preve outlined in more detail in a detailed CEMP sp and agreed with relevant authority prior to co Measures detailed in Chapter 19: Groundwa Onshore Outline CEMP (APP-505 Rev002R
					 Designated areas for the storage of chemicals;
					 On-site availability of oil spill clean-up eq and inflatable booms for use in the eve
					Use of drip trays under mobile plant; ar
					Drain socks to trap sediment entering the sediment entering t
					Therefore, it is considered that potential effe from accidental spills and/or litter from the P result in an adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Devel 16.16 of the ES) plus the North Portsea Islan



nt. However, routine mitigation ns of waste management, pollution aste and Material Resources of the ES re prevented and will therefore not iled in Chapter 27 are summarised in r002<u>Rev004</u>) and detail incorporating a Site Waste Management Plan are to:

kely to be produced during the works to cycling;

e 'designed out;

sation and management;

ities to increase re-use and recycling

t contractors and record appropriate es and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative g.

evention of contamination will be specific to the works to be undertaken commencement of construction works. vater and further captured in the <u>Rev004</u>) include:

of hazardous materials, fuels and

equipment including absorbent material /ent of an oil spill or leak;

and

the watercourse.

fects on bar-tailed godwit resulting Proposed Development alone will not

plans or projects which have temporal relopment (Appendices 16.15 and land Coastal Flood Defence Scheme,

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Plack toiled	Mointaining or rootoring	Disturbance	Disturbance	Poduce the frequency	Phase 4B - Coastline Between Milton Comm Road (19/01368/FUL), are considered to be Given the requirement to adhere to similar be contribute to in combination effects, it is com adverse effects on site integrity from accide combination with other project and plans (see intregrity matrices for the SPA).
Black-tailed Godwit ⁴⁴	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.	 Black-tailed godwit is considered to be of mail Therefore, the presence of construction ass Harbour may disturb this species. This species in intertidal areas of the Study Area during is Development with a peak count of 75 birds of however of suitable habitat for this species to considered that construction and decommiss black-tailed godwit through unpredictable not only very small numbers are present. The P within an industrialised setting so that noise conditions. Other than where HDD routes up not coincide with the SPA itself. Furthermore Chichester and Langstone Harbour SPA and community will be avoided by restricting word as October to March (the period when SPA from their breeding grounds (Snow and Period Onshore Ecology (APP-131) and Appendix Features of Chichester & Langstone Harbout to revision following consultation with Naturatupdated Outline Onshore Construction Envi (OOCEMP; APP-505 Rev002 Rev004). Those which was only recorded utilising intertidal here is the SPA are not included in any restriction of the SPA are not included in any restriction which was only recorded utilising intertidation with a species of the SPA are not included in any restriction in the Principle 5: Construction works of 55 – a major road and/or adjacent to industriate existing noise can be undertaken unrestriction for the Proposed Development would be the Proposed Development would be preserved and and the proposed Development would be avoided by and appendix and and proposed Development are preserved and and preserved and preserved and preserved and preserved and preserved and p

⁴⁴ Black-tailed godwit qualifies for the Ramsar site only – conservation objectives presented are reproduced from bar-tailed godwit from the SPA.



nmon and Kendall's Wharf Eastern be localised and temporary.

best practice measures which could onsidered that there is no potential for lental spills and litter, either alone or in see Appendix 1 for the screening and

moderate sensitivity to disturbance. ssociated with HDD works in Langstone ecies was recorded on four occasions surveys conducted for the Proposed s (APP-421). Given the proximity s to the Proposed Development, it is issioning works may displace wintering noise events, although it is evident that Proposed Development is however se effects would not add to baseline underlie the SPA, the Order Limits do ore, effects of the construction stage on and its wintering intertidal bird vorks within the winter season, defined A birds such as bar-tailed godwit arrive errins, 1998).

tions are provided in Chapter 16: ix 16.14: Winter Working Restriction for ours SPA (APP-422)and then subject ural England which are captured in the nvironmental Monitoring Plan nose relevant to black-tailed godwit I habitat are Principles 3-6:

E Cable Route that are over 400 m from stion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to trial sites with notable levels (>60 dB) of stricted. It is considered that noise levels d be masked in these instances.

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Principle 6: Percussive piling or wor resulting in a noise level in excess of 69 receptor) should be avoided during the to March inclusive. The sensitive recep any SPA supporting habitat (e.g. high tid Adoption of these principles will ensure that fromnoise and from noise, vibration and visit within the SPA. Noise effects from both tren overlaps at 69dbLAmax is extremely limited Trenching / road saw construction is restrict
					overlap with SWBGS sites so this section w adjacent intertidal habitat. The only other se Principle 6 is the section of the Onshore Cal the P23B SWBGS.
					In accordance with the requirements of the optimised in the perimeter of the HDD component of the HDD component of the HDD component of the matter of the HDD component of the the the text of text of the text of tex of tex of text
					<u>occurs outside of the compounds for HDD-4</u> <u>The SPA is in an urban setting and recent redisturbance does not have a significant impations (Goss-Custard <i>et al.</i>, 2019). <u>HDD compounds will however also reduce veloces of the baseline environment</u></u>
					Therefore, it is considered that potential effe from disturbance and displacement from the not result in an adverse effect on site integri Potential effects resulting from the limited pl and spatial overlap with the Proposed Devel considered to be localised and temporary.
					The North Portsea Island Coastal Flood Def Between Milton Common and Kendall's Wha includes a full winter working restriction (Oct black-tailed godwit. Such restrictions have b projects identified as potentially affecting wir SWBGS, as outlined in Appendices 16.15 at APP-424). Potential overlap between the Pr and mitigation areas for the North Portsea Is Phase 4b would occur if the Proposed Deve



orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October ptor is the nearest point of the SPA or tide roosting site).

at there are no adverse effects sual disturbance on black-tailed godwit enching / road saw and HDD works d with regards to intertidal habitat. cted along Eastern Road because of will also not provide any disturbance to section of the route that is restricted by able Route from Milton Locks north to

e OOCEMP, screening of at least 2 m pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been O works in proximity to the SWBGS max as a result of this screening only -4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close). The screening at the perimeter of visual disturbance to indistinguishable ent.

fects on black-tailed godwit resulting ne Proposed Development alone will rity.

olans or projects which have temporal elopment (APP-423 and APP-424) are

efence Scheme, Phase 4B - Coastline harf Eastern Road (19/01368/FUL) ctober – March) so will not disturb been adopted by other plans or *v*intering bird features of the SPA or and 16.16 of the ES (APP-423 and Proposed Development Order Limits Island Coastal Flood Defence Scheme velopments southern route option

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					around Milton Common is taken. However, to form part of the proposed mitigations/compe- connection with the planning permission with most recent documents submitted to discha
					As such, it is considered that there is no pot integrity from disturbance and displacement other project and plans (for full details see A integrity matrices for the Ramsar site).
		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 chemical spillages may occ decommissioning phases. Spills have the po- godwit utilising intertidal and other supporting Unplanned disposal of industrial or user plass decommissioning phases also has the poter mortality through ingestion or entanglement, measures of standard best practice in terms prevention measures (see Chapter 27: Was APP-142) will ensure that these events are in an adverse effect. Measures detailed in C Onshore Outline CEMP (APP-505 Rev002)r Materials Management Plan ('MMP') and Sir ('SWMP'). The key matters of the SWMP are
					 Identify the volume of waste streams like establish the potential for reuse and recy
					Identify possible options for waste to be
					Identify opportunities for waste minimisa
					 Identify the most significant opportuniti rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling
					Best practice recommendations for the prevolution outlined in more detail in a detailed CEMP s and agreed with relevant authority prior to compass detailed in Chapter 19: Groundward in the Onshore Outline CEMP (APP-505 Reference)
					Designated areas for the storage of haza



, those compensation measures do not pensations to be provided in with reference 19/01368/FUL as per the marge the relevant planning conditions.

otential for adverse effects on site nt, either alone or in combination with Appendix 5 for the screening and

occur during the construction and potential to directly affect black-tailed ting habitats resulting in mortality. lastic during construction and tential to cause black-tailed godwit nt. However, routine mitigation ns of waste management, pollution aste and Material Resources of the ES e preventedand will therefore not result Chapter 27 are summarised in the 2)nd Rev004) and detail incorporating a Site Waste Management Plan are to:

kely to be produced during the works to cycling;

e 'designed out;

sation and management;

nities to increase re-use and recycling

t contractors and record appropriate es and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative ng.

evention of contamination will be specific to the works to be undertaken commencement of construction works. water (APP-134) and further captured ev002<u>Rev004</u>) include:

zardous materials, fuels and chemicals;

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 On-site availability of oil spill clean-up ed and inflatable booms for use in the even Use of drip trays under mobile plant; and Drain socks to trap sediment entering the Therefore, it is considered that potential effection accidental spills and/or litter from the P result in an adverse effect on site integrity. Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be locali Given the requirement to adhere to similar k contribute to in combination effects, it is con adverse effects on site integrity from accide combination with other project and plans (see
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.	 integrity matrices for the Ramsar site). Curlew is considered to be of moderate sen presence of construction associated with HI disturb this species. This species was record occasional surveys at high tide in intertidal a individuals noted (APP-421). Given the proxide Development, it is considered that construct displace wintering curlew from favoured has events. The Proposed Development is howe that noise effects would not add to baseline routes underlie the SPA, the Order Limits do Furthermore, effects of the construction stage Harbour SPA and its wintering intertidal bird restricting works within the winter season, diperiod when SPA birds such as curlew arriv and Perrins, 1998). A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint of Chichester & Langstone Harbours SPA (A following consultation with Natural England Outline Onshore Construction Environmenta 505 Rev002Rev004). Those relevant to curlintertidal habitat are Principles 3-6:



equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse.

ffects on black-tailed godwit resulting Proposed Development alone will not

plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.

best practice measures which could posidered that there is no potential for ental spills and litter, either alone or in see Appendix 5 for the screening and

ensitivity to disturbance. Therefore, the HDD works in Langstone Harbour may orded at all low tide surveys and I areas of the Study Area with up to 61 oximity of these areas to the Proposed action and decommissioning works may abitat through unpredictable noise wever within an industrialised setting so he conditions. Other than where HDD do not coincide with the SPA itself. age on Chichester and Langstone rd community will be avoided by defined as October to March (the ive from their breeding grounds (Snow

ions was provided in Chapter 16: nter Working Restriction for Features (APP-422)and then subject to revision d which are captured in the updated ntal Monitoring Plan (OOCEMP; APPurlew which was only recorded utilising

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Principle 3: Elements of the Onshore C the SPA are not included in any restriction
					Principle 4: Construction noise events o
					 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unrestri from the Proposed Development would be
					 Principle 6: Percussive piling or work resulting in a noise level in excess of 690 receptor) should be avoided during the b to March inclusive. The sensitive recept any SPA supporting habitat (e.g. high tide)
					Adoption of these principles will ensure that a noise-and, vibration and visual disturbance of effects from both trenching / road saw and H extremely limited with regards to intertidal has construction is restricted along Eastern Road sites so this section will also not provide any habitat. The only other section of the route th section of the Onshore Cable Route from Mil SWBGS.
					In accordance with the requirements of the C
					high around the perimeter of the HDD compo
					noise mitigation. Example screening solution
					OOCEMP (APP-505 Rev004). The benefit th
					included in 3D noise modelling for the HDD v
					sites. Construction noise at over 69db LAma
					occurs outside of the compounds for HDD-4
					The SPA is in an urban setting and recent re
					disturbance does not have a significant impa
					to conurbations (Goss-Custard et al., 2019).
					HDD compounds will however also reduce v
					levels regardless of the baseline environmer
					Therefore, it is considered that potential effect disturbance and displacement from the Prop
					result in an adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Develor considered to be localised and temporary.



Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October ptor is the nearest point of the SPA or ide roosting site).

at there are no adverse effects from on curlew within the SPA. Noise HDD works overlaps at 69dbLAmax is habitat. Trenching / road saw ad because of overlap with SWBGS hy disturbance to adjacent intertidal that is restricted by Principle 6 is the Wilton Locks north to the P23B

<u>e OOCEMP, screening of at least 2 m</u> pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been O works in proximity to the SWBGS max as a result of this screening only -4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close <u>(). The screening at the perimeter of</u> visual disturbance to indistinguishable ent.

fects on curlew resulting from posed Development alone will not

plans or projects which have temporal elopment (APP-423 and APP-424) are

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					The North Portsea Island Coastal Flood Def Between Milton Common and Kendall's Wh includes a full winter working restriction (Oc curlew. Such restrictions have been adopted as potentially affecting wintering bird feature in Appendices 16.15 and 16.16 of the ES (A overlap between the Proposed Development for the North Portsea Island Coastal Flood D occur if the Proposed Developments southe Common is taken. However, those compens the proposed mitigations/compensations to planning permission with reference 19/0136 documents submitted to discharge the relev As such, it is considered that there is no pot integrity from disturbance and displacement other project and plans (for full details see A integrity matrices).
		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, Orthoptera,</i> <i>Carcinus, Nereis</i>) at preferred sizes.) at preferred sizes.	 Unplanned oil or chemical spillages may och decommissioning phases. Spills have the poutilising intertidal and other supporting habit disposal of industrial or user plastic during of phases also has the potential to cause curler entanglement. However, routine mitigation in terms of waste management, pollution prever Waste and Material Resources of the ES AF are prevented and will therefore not result in in Chapter 27 are summarised in the Onshor Rev002Rev004) and detail incorporating a Management Plan ('SWMP' to: Identify the volume of waste streams like establish the potential for reuse and records. Identify opportunities for waste minimisate. Identify the most significant opportunities rates; Identify suitable waste management licences, permits, waste transfer notes notes; and



Pefence Scheme, Phase 4B - Coastline (harf Eastern Road (19/01368/FUL) October – March) so will not disturb ted by other plans or projects identified ares of the SPA or SWBGS, as outlined (APP-423 and APP-424). Potential ent Order Limits and mitigation areas d Defence Scheme Phase 4b would hern route option around Milton ensation measures do not form part of o be provided in connection with the B68/FUL as per the most recent evant planning conditions.

otential for adverse effects on site nt, either alone or in combination with Appendix 1 for the SPA screening and

boccur during the construction and potential to directly affect curlew bitats resulting in mortality. Unplanned g construction and decommissioning rlew mortality through ingestion or n measures of standard best practice in evention measures (see Chapter 27: APP-142) will ensure that these events in an adverse effect. Measures detailed hore Outline CEMP (APP-505 a Materials Management Plan ('MMP') IP'. The key matters of the SWMP are

kely to be produced during the works to cycling;

e 'designed out;

sation and management;

ities to increase re-use and recycling

t contractors and record appropriate es and hazardous waste consignment

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Consider appropriate site practices such and the measures that will be used for ration waste reduction, reuse and recycling. Best practice recommendations for the prevoutlined in more detail in a detailed CEMP is and agreed with relevant authority prior to comeasures detailed in Chapter 19: Groundwares in the Onshore Outline CEMP include: Designated areas for the storage of haza On-site availability of oil spill clean-up erand inflatable booms for use in the event Use of drip trays under mobile plant; and Drain socks to trap sediment entering the Therefore, it is considered that potential effects resulting from the limited pland spatial overlap with the Proposed Dever plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ket (19/01368/FUL), are considered to be localities of the requirement to adhere to similar the contribute to in combination effects, it is combination with other project and plans (see and integrity matrices).
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 considered to be of moderate the presence of construction associated wit may disturb this species. occurred only at lo for the Proposed Development (peak count sighting at high tide. This species was restri- in the south of the Study Area (APP-421). On the Proposed Development, it is considered decommissioning works may displace winter through unpredictable noise events. The Pre- within an industrialised setting so that the ne- conditions. Other than where HDD routes underlie the set with the SPA itself. Furthermore, effects of the and Langstone Harbour SPA and its winter avoided by restricting works within the winter



ich as how materials will be segregated raising awareness among site operative ng.

evention of contamination will be specific to the works to be undertaken commencement of construction works. water (APP-134) and further captured

zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse.

ffects on curlew resulting from losed Development alone will not result

plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.

best practice measures which could onsidered that there is no potential for lental spills and litter, either alone or in see Appendix 1 for the SPA screening

ate sensitivity to disturbance. Therefore, vith HDD works in Langstone Harbour low tide during the surveys conducted nt of 19 in January 2018), with only one stricted to intertidal mud habitat mainly Given the proximity of these areas to ed that construction and

tering grey plover from favoured habitat Proposed Development is however noise effects would not add to baseline

e SPA, the Order Limits do not coincide f the construction stage on Chichester ering intertidal bird community will be iter season, defined as October to

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					March (the period when SPA birds such as grounds (Snow and Perrins, 1998).
					A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Wint of Chichester & Langstone Harbours SPA (A following consultation with Natural England Outline Onshore Construction Environmenta 505 <u>Rev002Rev004</u>). Those relevant to grey utilising intertidal habitat are Principles 3-6:
					• Principle 3 : Elements of the Onshore O the SPA are not included in any restriction
					• Principle 4: Construction noise events of
					 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unrestr from the Proposed Development would be
					 Principle 6: Percussive piling or work resulting in a noise level in excess of 690 receptor) should be avoided during the k to March inclusive. The sensitive recept any SPA supporting habitat (e.g. high tid
					Adoption of these principles will ensure that noise-andvibration and visual disturbance effects from both trenching / road saw and H extremely limited with regards to intertidal ha construction is restricted along Eastern Roa sites so this section will also not provide any habitat. The only other section of the route to section of the Onshore Cable Route from Mi SWBGS.
					In accordance with the requirements of the operation of the HDD composition of the HDD sites. Construction noise at over 69db LAma occurs outside of the compounds for HDD-4



s grey plover arrive from their breeding

ons was provided in Chapter 16: nter Working Restriction for Features (APP-422) and then subject to revision d which are captured in the updated ntal Monitoring Plan (OOCEMP; APPey plover which was only recorded

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant i9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October eptor is the nearest point of the SPA or tide roosting site).

at there are no adverse effects from e on grey plover within the SPA. Noise HDD works overlaps at 69dbLAmax is habitat. Trenching / road saw bad because of overlap with SWBGS ny disturbance to adjacent intertidal e that is restricted by Principle 6 is the Milton Locks north to the P23B

<u>e OOCEMP, screening of at least 2 m</u> pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been D works in proximity to the SWBGS nax as a result of this screening only 4 and HDD-6.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					The SPA is in an urban setting and recent r disturbance does not have a significant imp to conurbations (Goss-Custard <i>et al.</i> , 2019) HDD compounds will however also reduce levels regardless of the baseline environme Therefore, it is considered that potential effe disturbance and displacement from the Pro result in an adverse effect on site integrity. Potential effects resulting from the limited p and spatial overlap with the Proposed Deve considered to be localised and temporary. The North Portsea Island Coastal Flood De Between Milton Common and Kendall's Wr includes a full winter working restriction (Oc plover. Such restrictions have been adopted as potentially affecting wintering bird feature in Appendices 16.15 and 16.16 of the ES (A overlap between the Proposed Development for the North Portsea Island Coastal Flood occur if the Proposed Developments southe Common is taken. However, those compent the proposed mitigations/compensations to planning permission with reference 19/0136 documents submitted to discharge the relev As such, it is considered that there is no po integrity from disturbance and displacement other project and plans (for full details see the
		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.	Appendix 1 for the SPA and Appendix 5 for Unplanned oil or chemical spillages may oc decommissioning phases. Spills have the po- utilising intertidal and other supporting habit disposal of industrial or user plastic during of phases also has the potential to cause grey entanglement. However, routine mitigation of terms of waste management, pollution preve Waste and Material Resources of the ES Al are prevented and will therefore not result in in Chapter 27 are summarised in the Onsho Rev002)Rev004) and detail incorporating a and Site Waste Management Plan ('SWMP' to:



t research has established that visual spact on waterbirds in an estuary close 9). The screening at the perimeter of e visual disturbance to indistinguishable ment.

ffects on grey plover resulting from roposed Development alone will not

plans or projects which have temporal velopment (APP-423 and APP-424) are

Defence Scheme, Phase 4B - Coastline /harf Eastern Road (19/01368/FUL) Dctober – March) so will not disturb grey red by other plans or projects identified ures of the SPA or SWBGS, as outlined (APP-423 and APP-424). Potential ent Order Limits and mitigation areas d Defence Scheme Phase 4b would hern route option around Milton ensation measures do not form part of to be provided in connection with the 368/FUL as per the most recent evant planning conditions.

ootential for adverse effects on site ent, either alone or in combination with the screening and integrity matrices at or the Ramsar site).

boccur during the construction and potential to directly affect grey plover bitats resulting in mortality. Unplanned g construction and decommissioning ey plover mortality through ingestion or n measures of standard best practice in evention measures (see Chapter 27: APP-142) will ensure that these events in an adverse effect. Measures detailed hore Outline CEMP (APP-505 a Materials Management Plan ('MMP') IP'). The key matters of the SWMP are

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Identify the volume of waste streams like establish the potential for reuse and recy
					 Identify possible options for waste to be '
					 Identify opportunities for waste minimisat
					 Identify the most significant opportunitie rates;
					 Identify suitable waste management of licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for rai for waste reduction, reuse and recycling.
					Best practice recommendations for the preve outlined in more detail in a detailed CEMP in undertaken and agreed with relevant authori construction works. Measures detailed in Ch and further captured in the Onshore Outline include:
					 Designated areas for the storage of haza
					 On-site availability of oil spill clean-up eq and inflatable booms for use in the event
					 Use of drip trays under mobile plant; and
					 Drain socks to trap sediment entering the
					Therefore, it is considered that potential effect accidental spills and/or litter from the Proposition of the analysis of the second state integrity. Potential effects resulting from the limited plat and spatial overlap with the Proposed Developulation the North Portsea Island Coastal Flood Coastline Between Milton Common and Ken (19/01368/FUL), are considered to be localist
					Given the requirement to adhere to similar be contribute to in combination effects, it is cons adverse effects on site integrity from acciden combination with other projects and plans for integrity matrices at Appendix 1 for the SPA



- kely to be produced during the works to cycling;
- e 'designed out;
- sation and management;
- ities to increase re-use and recycling
- contractors and record appropriate as and hazardous waste consignment
- ch as how materials will be segregated raising awareness among site operative g.
- evention of contamination will be in relation to the specific works to be ority prior to commencement of Chapter 19: Groundwater (APP-134) e CEMP (APP-505 <u>Rev002Rev004</u>)
- zardous materials, fuels and chemicals;
- equipment including absorbent material ent of an oil spill or leak;
- nd
- the watercourse.
- fects on grey plover resulting from osed Development alone will not result
- plans or projects which have temporal elopment (APP-0423 and APP-424) of Defence Scheme, Phase 4B endall's Wharf Eastern Road lised and temporary.
- best practice measures which could onsidered that there is no potential for ental spills and litter, either alone or in for full details see the screening and A and Appendix 5 for the Ramsar site).

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature Turnstone	Conservation Objectives Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	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. Balanus, Mytilus, Carcinus, Gammarus, Littorina, dipertan flies, kelp-fly larvae) at preferred sizes.	 Assessment Unplanned oil or chemical spillages may occ decommissioning phases. Spills have the po- utilising intertidal and other supporting habits disposal of industrial or user plastic during of phases also has the potential to cause turns entanglement. However, routine mitigation on terms of waste management, pollution preve Waste and Material Resources of the ES AF are preventedand will therefore not result in in Chapter 27 are summarised in the Onsho Rev002)Rev004) and detail incorporating a and Site Waste Management Plan ('SWMP' to: Identify the volume of waste streams like establish the potential for reuse and recy Identify opportunities for waste to be Identify upportunities for waste minimisa Identify suitable waste management licences, permits, waste transfer notes notes; and Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling Best practice recommendations for the prev- outlined in more detail in a detailed CEMP's and agreed with relevant authority prior to co Measures detailed in Chapter 19: Groundwas in the Onshore Outline CEMP (APP-505 Re- Designated areas for the storage of haza On-site availability of oil spill clean-up ed and inflatable booms for use in the even Use of drip trays under mobile plant; and Drain socks to trap sediment entering the Therefore, it is considered that potential effer accidental spills and/or litter from the Proposition of the previous



ccur during the construction and potential to directly affect turnstone sitats resulting in mortality. Unplanned construction and decommissioning nstone mortality through ingestion or measures of standard best practice in vention measures (see Chapter 27: APP-142) will ensure that these events n an adverse effect. Measures detailed nore Outline CEMP (APP-505 a Materials Management Plan ('MMP') P'). The key matters of the SWMP are

kely to be produced during the works to cycling;

e 'designed out;

sation and management;

ities to increase re-use and recycling

contractors and record appropriate es and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative g.

evention of contamination will be specific to the works to be undertaken commencement of construction works. vater (APP-134) and further captured ev002<u>Rev004</u>) include:

zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

nd

he watercourse.

fects on turnstone resulting from osed Development alone will not result

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Potential effects resulting from the limited p and spatial overlap with the Proposed Deve plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ke (19/01368/FUL), are considered to be local Given the requirement to adhere to similar l contribute to in combination effects, it is cor adverse effects on site integrity from accide combination with other project and plans (for integrity matrices at Appendix 1 for the SPA
Sanderling	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	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 chemical spillages may oc decommissioning phases. Spills have the p utilising intertidal and other supporting habit disposal of industrial or user plastic during of phases also has the potential to cause sand entanglement. However, routine mitigation of terms of waste management, pollution prev Waste and Material Resources of the ES Al are prevented and will therefore not result in detailed in Chapter 27 are summarised in the <u>Rev002)Rev004)</u> and detail incorporating a and Site Waste Management Plan ('SWMP to:
					 Identify the volume of waste streams like establish the potential for reuse and rec
					Identify possible options for waste to be
					Identify opportunities for waste minimisa
					 Identify the most significant opportuni rates;
					 Identify suitable waste management licences, permits, waste transfer note notes; and
					Consider appropriate site practices suc and the measures that will be used for ra for waste reduction, reuse and recycling
					Best practice recommendations for the prevoutlined in more detail in a detailed CEMP s and agreed with relevant authority prior to c Measures detailed in Chapter 19: Groundwa in the Onshore Outline CEMP (APP-505 Re



plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B -Xendall's Wharf Eastern Road alised and temporary.

r best practice measures which could onsidered that there is no potential for dental spills and litter, either alone or in (for full details see the screening and PA).

biccur during the construction and potential to directly affect sanderling bitats resulting in mortality. Unplanned g construction and decommissioning nderling mortality through ingestion or n measures of standard best practice in evention measures (see Chapter 27: APP-142) will ensure that these events t in an adverse effect. Measures the Onshore Outline CEMP (APP-505 a Materials Management Plan ('MMP') IP'). The key matters of the SWMP are

ikely to be produced during the works to ecycling;

be 'designed out;

sation and management;

nities to increase re-use and recycling

at contractors and record appropriate tes and hazardous waste consignment

uch as how materials will be segregated raising awareness among site operative ng.

evention of contamination will be P specific to the works to be undertaken o commencement of construction works. water (APP-134) and further captured Rev002<u>Rev004</u>) include:

Feature Conse	rvation Objectives Effect	t Attribute	Target	Assessment
Ringed Mainta plover Mainta the po qualify the dis	ining or restoring bulations of ing features, and tribution of ing features within	lental Supporting habitat: food	Target Maintain the distribution, abundance and availability of key food and prey items e.g. Invertebrates, marine worms, crustaceans and molluscs) at preferred sizes.	 Assessment Designated areas for the storage of haza On-site availability of oil spill clean-up ed and inflatable booms for use in the even Use of drip trays under mobile plant; and Drain socks to trap sediment entering the Therefore, it is considered that potential effect accidental spills and/or litter from the Propose in an adverse effect on site integrity. Potential effects resulting from the limited pl and spatial overlap with the Proposed Devel plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be localist Given the requirement to adhere to similar be contribute to in combination effects, it is con adverse effects on site integrity from accider combination with other project and plans (fo integrity matrices at Appendix 1 for the SPA Unplanned oil or chemical spillages may occ decommissioning phases. Spills have the pop ploverutilising intertidal and other supporting Unplanned disposal of industrial or user plas decommissioning phases also has the poter through ingestion or entanglement. Howeve standard best practice in terms of waste ma measures (see Chapter 27: Waste and Mate will ensure that these events are prevented adverse effect. Measures detailed in Chapte Outline CEMP (APP-505 Rev002)Rev004) a Management Plan ('MMP') and Site Waste I matters of the SWMP are to: Identify the volume of waste streams like establish the potential for reuse and recy Identify possible options for waste to be



zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse.

fects on sanderling resulting from osed Development alone will not result

plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.

best practice measures which could onsidered that there is no potential for ental spills and litter, either alone or in for full details see the screening and (A).

accur during the construction and potential to directly affect ringed ing habitats resulting in mortality. astic during construction and ential to cause ringed plover mortality ver, routine mitigation measures of nanagement, pollution prevention aterial Resources of the ES APP-142) d and will therefore not result in an oter 27 are summarised in the Onshore and detail incorporating a Materials e Management Plan ('SWMP'). The key

kely to be produced during the works to cycling;

e 'designed out;

ation and management;

ities to increase re-use and recycling

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Identify suitable waste management licences, permits, waste transfer notes notes; and Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling Best practice recommendations for the prev outlined in more detail in a detailed CEMP s and agreed with relevant statutory consulted construction works. Measures detailed in Cr and further captured in the Onshore Outline include: Designated areas for the storage of haza On-site availability of oil spill clean-up eo and inflatable booms for use in the even Use of drip trays under mobile plant; and Drain socks to trap sediment entering the Therefore, it is considered that potential effect accidental spills and/or litter from the Propose in an adverse effect on site integrity. Potential effects resulting from the limited pl and spatial overlap with the Proposed Devel plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be localist Given the requirement to adhere to similar be contribute to in combination effects, it is con adverse effects on site integrity from accider combination with other project and plans (fo integrity matrices at Appendix 1 for the SPA
Dunlin	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	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,</i> <i>Crangon, Carcinus</i> , dipertan flies, beetles, caddisfly, wasps, sawflies, mayflies) at preferred sizes.	Unplanned oil or chemical spillages may occ decommissioning phases. Spills have the po- utilising intertidal and other supporting habita disposal of industrial or user plastic during c phases also has the potential to cause dunli entanglement. However, routine mitigation n terms of waste management, pollution preve Waste and Material Resources of the ES AF are prevented and will therefore not result in



contractors and record appropriate es and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative g.

evention of contamination will be specific to the works to be undertaken ees prior to commencement of Chapter 19: Groundwater (APP-134) e CEMP (APP-505 <u>Rev002Rev004</u>)

zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

nd

he watercourse.

fects on ringed plover resulting from osed Development alone will not result

plans or projects which have temporal elopment (APP-423 and APP-424)) of Defence Scheme, Phase 4B endall's Wharf Eastern Road lised and temporary.

best practice measures which could onsidered that there is no potential for ental spills and litter, either alone or in for full details see the screening and A and Appendix 5 for the Ramsar site).

ccur during the construction and potential to directly affect dunlin bitats resulting in mortality. Unplanned construction and decommissioning hlin mortality through ingestion or measures of standard best practice in vention measures (see Chapter 27: APP-142) will ensure that these events in an adverse effect. Measures detailed

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					in Chapter 27 are summarised in the Onshor Rev002 <u>Rev004</u>) and detail incorporating a M and Site Waste Management Plan ('SWMP') to:
					 Identify the volume of waste streams likel establish the potential for reuse and recycle
					 Identify possible options for waste to be 'dentify possible options for waste toptify possible options for waste to be 'dentify possible option
					 Identify opportunities for waste minimisat
					 Identify the most significant opportunitie rates;
					 Identify suitable waste management of licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for rais for waste reduction, reuse and recycling.
					Best practice recommendations for the preve outlined in more detail in a detailed CEMP sp and agreed with relevant authority prior to co Measures detailed in Chapter 19: Groundwat in the Onshore Outline CEMP (APP-505 Rev
					 Designated areas for the storage of haza
					 On-site availability of oil spill clean-up equand inflatable booms for use in the event
					 Use of drip trays under mobile plant; and
					 Drain socks to trap sediment entering the
					Therefore, it is considered that potential effect accidental spills and/or litter from the Propos in an adverse effect on site integrity.
					Potential effects resulting from the limited pla and spatial overlap with the Proposed Develo plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ken (19/01368/FUL), are considered to be localis
					Given the requirement to adhere to similar be contribute to in combination effects, it is cons adverse effects on site integrity from acciden



nore Outline CEMP (APP-505 Materials Management Plan ('MMP') P'). The key matters of the SWMP are

kely to be produced during the works to cycling;

e 'designed out;

ation and management;

ities to increase re-use and recycling

contractors and record appropriate as and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative g.

evention of contamination will be specific to the works to be undertaken commencement of construction works. vater (APP-134) and further captured ev002)<u>Rev004)</u>include:

zardous materials, fuels and chemicals;

equipment including absorbent material ent of an oil spill or leak;

the watercourse.

fects on dunlin resulting from osed Development alone will not result

plans or projects which have temporal elopment (APP-423 and APP-424) of Defence Scheme, Phase 4B endall's Wharf Eastern Road lised and temporary.

best practice measures which could onsidered that there is no potential for ental spills and litter, either alone or in

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					combination with other project and plans (for integrity matrices at Appendix 1 for the SPA
Waterfowl assemblage	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.	 Species that contribute to the waterfowl assern otably dark-bellied brent goose (Cutts <i>et al.</i> activities associated with HDD works in Lange disturb all sensitive species within the assern Route works in and adjacent to SWBGS site bellied brent geese at both roosting and forat despite the industrial setting of the Proposed Group, 2018). Specific surveys for this species for the Proprelatively low numbers of most components of numbers in intertidal areas although notable occurred in both intertidal and terrestrial (i.e. (App-421APP-421)). Furthermore, given the p Proposed Development, construction and deconsidered to have the potential to displace from favoured foraging and roosting habitat to Construction work within the SWBGS sites w grassland foraging habitat where the construstions and movements of construction work within the sites during winter work the sites from noise and movements of construction graging areas. The following SWBGS sites of the Proposed Development: P25 – University of Portsmouth, Langsto P23B – University of Portsmouth, Langsto P23B – Milton Common north 1; P23R – Milton Common north 2; P11 – Kendall's Wharf playing fields; and P08A – Farlington playing fields. Effects of the construction stage on Chichess its wintering intertidal bird community will be the winter season, defined as October to Ma species such as dark-bellied brent goose arr (Snow and Perrins, 1998).



or full details see the screening and A and Appendix 5 for the Ramsar site).

essemblage of the SPA and Ramsar ensitivity to disturbance, including most *al.*, 2013). Therefore, construction ingstone Harbour have the potential to emblage while the Onshore Cable ites have the potential to disturb darktraging components of their daily cycle ed Development (SWBGS Steering

oposed Development recorded s of the waterfowl assemblage notable le numbers of dark-bellied brent goose e. SWBGS) areas of the Study Area e proximity of these areas to the decommissioning works are e wintering dark-bellied brent goose at through unpredictable noise events. s will reduce the availability of truction stage overlaps with the winter I other wintering birds that are

October to March (Carboneras et al. would produce direct disturbance of nstruction vehicles and machinery, ng grassland within the sites as s overlap with onshore components of

tone Campus;

nd

ester and Langstone Harbour SPA and be avoided by restricting works within March (the period when SPA qualifying arrive from their breeding grounds

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					A detailed overview of the working restriction Onshore Ecology and Appendix 16.14: Winter of Chichester and Langstone Harbours SPA revisions following consultation with Natural updated Outline Onshore CEMP (APP-505 F principles that will be incorporated into working • Principle 1 : Construction works can
					categorised as either core, primary sup candidate) sites that overlap with the P during October – March. An exception i that is already disturbed by movements o functional habitat for brent geese or Chichester and Langstone Harbour SPA
					 Principle 2: Where HDD works are to ta (e.g. at Eastney Landfall) no direct imparestriction does not apply.
					 Principle 3: Elements of the Onshore C the SPA are not included in any restriction
					Principle 4: Construction noise events of
					 Principle 5: Construction works of 55 – a major road and/or adjacent to industria existing noise can be undertaken unrestr from the Proposed Development would be
					 Principle 6: Percussive piling or work resulting in a noise level in excess of 690 receptor) should be avoided during the k to March inclusive. The sensitive recept any SPA supporting habitat (e.g. high tid
					Adoption of Principle 1 (and reference to Prin adverse effects on those SWBGS sites that above (as these sites will not be subject to we are used by SPA birds), and effects of noise <u>disturbance</u> on birds within the SPA itself. Trenching / road saw noise at 69dbLAmax h SWBGS sites. However, SWBGS sites P54 affected due to the minimal overlap of the sit from trenching / road saw works. It is also consistent between the construction works and the noise so that in reality, there will be no of consequence, these two sites are excluded to



ions are provided in Chapter 16: nter Working Restriction for Features A (APP-422) and then subject to al England which are captured in the 5 Rev002) <u>Rev004)</u>. There are six rking methods:

annot take place in SWBGS (those upport, secondary support, low use or Proposed Developments Order Limits in is the gravel car park within site P11 s of cars, lorries and plant, and offers no or other waterbirds associated with PA.

take place underneath the SWBGS site pacts are considered to occur and the

Cable Route that are over 400 m from tion.

of <55 dB can occur unrestricted.

 72 dBLAmax immediately adjacent to rial sites with notable levels (>60 dB) of stricted. It is considered that noise levels be masked in these instances.

orks with heavy machinery (i.e. plant 9dbLAmax – measured at the sensitive e bird overwintering period (i.e. October ptor is the nearest point of the SPA or ide roosting site).

Principle 2) will ensure that there are no at lie within the Order Limits as detailed works in the winter period when they se-and <u>visual</u>

has the potential to affect fourteen 4 and P29 will not be adversely site areas with noise exceeding 69 dB considered that the buildings that are nd SWBGS sites will effectively buffer overlap of noise effects. In d from the restriction. In relation to the

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect		Target	Assessment remaining 12 sites although it considered likk highly urbanised environment, construction of potential to impact on them is restricted duries The percussive activities at HDD compound are anticipated to comprise the insertion of sovibrator at HDD-1, HDD-2, HDD-3 and HDD reception pit at HDD-4. In accordance with the requirements of the Chigh around the perimeter of the HDD compoise mitigation. Example screening solution OCCEMP (APP-505 Rev004). The benefit the included in 3D noise modelling for the HDD sites. Construction noise at over 69dbLAmas screening only occurs outside of the compound to contributions (Goss-Custard et al., 2019). HDD compounds will however also reduce velevels regardless of the baseline environment. With the combination of the seasonal restrict the potential effects on the watwerfowl asset and displacement from the Proposed Develor adverse effect on site integrity. Therefore, it is considered that potential effect resulting from disturbance and displacement alone will not result in an adverse effect on service and spatial overlap with the Proposed Develor considered to be localised and temporary. The North Portsea Island Coastal Flood Def Between Milton Common and Kendall's What includes a full winter working restriction (Oct dark-bellied brent goose. Such restrictions in APP-424). Potential overlap between the Prince and mitigation areas for the North Portsea Island coastal flood Def Between the Proposed for the prince of the propertice on the proposed Develor considered to be localised and temporary.



ikely that Principle 5 applies in this work which would otherwise have the ring October – March.

ids in proximity to the SWBGS sites f sheet piles via an excavator mounted D-6 and via a piling rig for the

e OOCEMP, screening of at least 2 m pounds is required for the purpose of ons are presented in plate 6.1 of the this screening affords has been D works in proximity to the SWBGS ax 69db LAmax as a result of this ounds for HDD-4 and HDD-6.

research has established that visual pact on waterbirds in an estuary close 0). The screening at the perimeter of e visual disturbance to indistinguishable ent.

iction and <mark>noise</mark> mitigation measures emblage resulting from disturbance elopment alone will not result in an

fects on the waterfowl assemblage int from the Proposed Development in site integrity.

olans or projects which have temporal elopment (APP-423 And APP-424) are

efence Scheme, Phase 4B - Coastline harf Eastern Road (19/01368/FUL) ctober – March) so will not disturb have been adopted by other plans or vintering bird features of the SPA or and 16.16 of the ES (APP-423 and Proposed Development Order Limits Island Coastal Flood Defence Scheme e option around Milton Common is sures do not form part of the proposed in connection with the planning

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					permission with reference 19/01368/FUL as submitted to discharge the relevant plannin As such, it is considered that there is no po- integrity from disturbance and displacement other project and plans (for full details see A intregrity matrices for the SPA and Appendi
		Accidental spills and Litter	Supporting habitat: quality of supporting non- breeding habitat	Maintain the structure, function and availability of the following habitats which support the assemblage feature for all stages (moulting, roosting, loafing, feeding) of the non- breeding period: intertidal sediments, intertidal seagrass beds, intertidal rock, saltmarsh, subtidal sediments, coastal lagoons, reedbeds, grazing marsh, water column, improved grassland and arable fields.	 Unplanned oil or chemical spillages may or decommissioning phases. Spills have the passemblage utilising intertidal and other sup Unplanned disposal of industrial or user pladecommissioning phases also has the potenthrough ingestion or entanglement. However, standard best practice in terms of waste maters of waste practice in terms of waste maters of the set chapter 27: Waste and Maters will ensure that these events are prevented adverse effect. Measures detailed in Chapter Outline CEMP (APP-505 Rev002)Rev004). Management Plan ('MMP') and Site Waste matters of the SWMP are to: Identify the volume of waste streams like establish the potential for reuse and record identify opportunities for waste minimisate. Identify the most significant opportunitier rates; Identify suitable waste management licences, permits, waste transfer notes notes; and Consider appropriate site practices suct and the measures that will be used for ratio or waste reduction, reuse and recycling. Best practice recommendations for the prevoutlined in more detail in a detailed CEMP sand agreed with relevant statutory consulte construction works. Measures detailed in C and further captured in the Onshore Outline include: Designated areas for the storage of haz



as per the most recent documents ing conditions.

ootential for adverse effects on site ent, either alone or in combination with Appendix 1 for the screening and dix 5 for the Ramsar site).

poccur during the construction and potential to directly affect the waterfowl upporting habitats resulting in mortality. lastic during construction and tential to cause waterfowl mortality ver, routine mitigation measures of nanagement, pollution prevention aterial Resources of the ES APP-142) ed and will therefore not result in an oter 27 are summarised in the Onshore 2 and detail incorporating a Materials e Management Plan ('SWMP'). The key

ikely to be produced during the works to ecycling;

be 'designed out;

sation and management;

nities to increase re-use and recycling

t contractors and record appropriate es and hazardous waste consignment

uch as how materials will be segregated raising awareness among site operative ng.

evention of contamination will be P specific to the works to be undertaken tees prior to commencement of Chapter 19: Groundwater (APP-134) ne CEMP (APP-505 <u>Rev002<u>Rev004</u>)</u>

azardous materials, fuels and chemicals;

WSP/Natural Power

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 On-site availability of oil spill clean-up er and inflatable booms for use in the even Use of drip trays under mobile plant; and Drain socks to trap sediment entering the Therefore, it is considered that potential effectives resulting from accidental spills and/or litter for alone will not result in an adverse effect on Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be locali Given the requirement to adhere to similar to adverse effects on site integrity from accide combination with other project and plans (for integrity matrices at Appendix 1 for the SPA
Supporting habitat (freshwater and grazing marsh)	Maintaining or restoring the extent, distribution, structure, function and supporting processes of the habitats of the qualifying features	Indirect effects	Supporting habitat: extent and distribution of supporting habitat for the non- breeding season	Maintain the structure, function and availability of the following habitats which support the assemblage feature for all stages (moulting, roosting, loafing, feeding) of the non- breeding period: intertidal sediments, intertidal seagrass beds, intertidal rock, saltmarsh, subtidal sediments, coastal lagoons, reedbeds, grazing marsh, improved grassland and arable fields.	No habitat within the SPA/Ramsar site will be temporary basis as a result of onshore consi Several SWBGS sites do however lie within P11, P23A, P23B and P23R. SWBGS are a importance to over-wintering waterbirds in the said to be functionally linked to the Special L including Chichester and Langstone Harbout Construction work within these sites will res- varying extents which would impact the ava- resource to dark-bellied brent goose. Restoration measures will be implemented of sward re-established to provide a suitable for geese return to the Solent to winter. The following two approaches are considered Re-seeding. Reinstate areas within SWE May where practicable. This is the easier Re-turfing. Where not practicable to re-so- This is a more costly option but allow growth in a shorter timescale.



equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse.

ffects on the waterfowl assemblage from the Proposed Development n site integrity. plans or projects which have temporal velopment (APP-423 and APP-424)) od Defence Scheme, Phase 4B -

endall's Wharf Eastern Road

lised and temporary.

best practice measures which could onsidered that there is no potential for lental spills and litter, either alone or in for full details see the screening and A and Appendix 5 for the Ramsar site).

I be lost on either a permanent or nstruction / decommissioning activities. in the Order Limits, namely: P08A, a areas that are of fundamental the Solent Region. SWBGS can be al Protection Area (SPA) network ours SPA / Ramsar site.

esult in temporary habitat loss to vailability of foraging and roosting

d which require completion and grass food resource by October when brent

ered for restoration of SWBGS sites:

VBGS with grass seed before the end of siest and most cost effective option;

e-seed, turf will be laid and established. ows re-establishment and good sward

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					The choice of restoration approach is primar within the summer growing season for imple be the optimal technique after May so that for month, re-turfing would be implemented. The preparation, establishment and aftercare are Outline CEMP (APP-505 <u>Rev002Rev004</u>).
					P211, P23A and P23 R will be subject to re- appropriate timescales to allow reestablishm subject to either re-seeding or re-turfing.
					Components of P08A will not be restored up no construction activities will take place on S winter season so that visual and noise distu- impact brent geese. National census data ga Ornithology (BTO) through their Wetland Bir that numbers present in England during Oct during the peak month of January. Additional important factors to consider inclu- require restoration in October and the propo- and the wider network.
					The October restoration area accounts for:
					 12 % of the P08A SWBGS;
					 1.2 % of SWBGS core sites; and
					0.2 % of the entire SWBGS network.
					On this basis, it is determined that the restor October would not impair the SWBGS netwine impact the non-breeding brent goose popular unavailability of 12% of the SWBGS, brent go therefore the functionality of the P08A SWB extensive remaining habitat
					The temporary habitat loss accounts for just 0.2% of the SWBGS network. Brent geese wo f Farlington SWBGS, which in itself forms j SWBGS network available.
					The loss of habitat will be temporary, covering breeding season and during a period when the population would not be present. The P08A for in advance of when the peak numbers of



arily dependent on the time available lementation. Re-seeding is not likely to for any restoration works after this hese measures including details of site re provided in the revised Onshore

e-turfing restoration within the ment prior to October. P23B will be

until the month of October. However, SWBGS sites in the non-breeding urbance associated with these will not gathered by the British Trust for Bird Survey (WeBS) Scheme shows ctober are approximately 30% of those

clude the amount of habitat that will portion that it is of the SWBGS sites

oration of 1.7 ha during the month of work and specifically it would not lation. Irrespective of the temporary geese would not be disturbed and BGS would not be lost due to the

st 1.2% of the SWBGS core sites and will still be able to utilise the majority just a small component of the

ring at most 17% of a single nonthe majority of the Solent brent goose A SWBGS will be restored it its entirety of geese are present in the region.

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Therefore, it is considered that potential indiresulting from temporary loss of functionally Development alone will not result in an adverse Potential effects resulting from the limited pl and spatial overlap with the Proposed Development to be localised and temporare considered to be localised and temporare. The North Portsea Island Coastal Flood Defe Between Milton Common and Kendall's What includes a similar commitment to restore all season (October – March) so will not disturb As such, it is considered that there is no pot integrity from indirect effects, either alone or and plans (for full details see Appendix 1 for for the SPA and Appendix 5 for the Ramsar
		Accidental spills and Litter	Supporting habitat: quality of supporting non- breeding habitat	Maintain the structure, function and availability of the following habitats which support the assemblage feature for all stages (moulting, roosting, loafing, feeding) of the non- breeding period: intertidal sediments, intertidal seagrass beds, intertidal rock, saltmarsh, subtidal sediments, coastal lagoons, reedbeds, grazing marsh, improved grassland and arable fields.	 Unplanned oil or chemical spillages from construction and decommissioning phases. affect prey species within supporting habitate effects. Unplanned disposal of industrial plata also has the potential to affect prey species. However, routine mitigation measures of stamanagement, pollution prevention measures. Material Resources of the ES APP-142) will prevented and will therefore not result in an Chapter 27 are summarised in the Onshore Rev002)Rev004) and detail incorporating a and Site Waste Management Plan ('SWMP' to: Identify the volume of waste streams like establish the potential for reuse and recy
					Identify possible options for waste to be
					Identify opportunities for waste minimisa
					 Identify the most significant opportuniti rates;
					 Identify suitable waste management licences, permits, waste transfer notes notes; and
					 Consider appropriate site practices such and the measures that will be used for ra for waste reduction, reuse and recycling



ndirect effects on supporting habitat Ily linked SWBGS from the Proposed Iverse effect on site integrity.

plans or projects which have temporal /elopment (APP-4234 and APP-424) rary.

efence Scheme, Phase 4B - Coastline /harf Eastern Road (19/01368/FUL) all SWBGS before the non-breeding urb dark-bellied brent goose.

ootential for adverse effects on site or in combination with other project for the screening and intregrity matrices ar site).

construction activity may occur during s. Spills have the potential to directly tats through a range of biological lastic during all development phases es through ingestion or entanglement. standard best practice in terms of waste res (see Chapter 27: Waste and rill ensure that these events are an adverse effect. Measures detailed in re Outline CEMP (APP-505 a Materials Management Plan ('MMP') P'). The key matters of the SWMP are

kely to be produced during the works to ecycling;

e 'designed out;

ation and management;

nities to increase re-use and recycling

t contractors and record appropriate es and hazardous waste consignment

ch as how materials will be segregated raising awareness among site operative ng.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Best practice recommendations for the prev outlined in more detail in a detailed CEMP s and agreed with relevant authority prior to co Measures detailed in Chapter 19: Groundwa in the Onshore Outline CEMP include:
					 Designated areas for the storage of haza
					 On-site availability of oil spill clean-up ed and inflatable booms for use in the even
					Use of drip trays under mobile plant; and
					 Drain socks to trap sediment entering th
					Therefore, it is considered that potential effe from accidental spills and/or litter from the P result in an adverse effect on site integrity.
					Potential effects resulting from the limited pl and spatial overlap with the Proposed Deve plus the North Portsea Island Coastal Flood Coastline Between Milton Common and Ker (19/01368/FUL), are considered to be localis
					Given the requirement to adhere to similar b contribute to in combination effects, it is con adverse effects on site integrity from accider
Osmalusia		4	ha a successful and a structure of the	han fuano tha Duana and I	combination with other project and plans (fo integrity matrices at Appendix 1 for the SPA Development alone, or in combination with other plan

Conclusion: No adverse effect on site integrity can be concluded, either from the Proposed Development alone, or in combination with other pla and Langstone Harbours SPA/Ramsar site.



evention of contamination will be specific to the works to be undertaken commencement of construction works. water (APP-134) and further captured

zardous materials, fuels and chemicals.;

equipment including absorbent material ent of an oil spill or leak;

nd

the watercourse.

ffects on supporting habitat resulting Proposed Development alone will not

plans or projects which have temporal velopment (APP-423 and APP-424) od Defence Scheme, Phase 4B endall's Wharf Eastern Road alised and temporary.

r best practice measures which could onsidered that there is no potential for dental spills and litter, either alone or in (for full details see the screening and PA and Appendix 5 for the Ramsar site). ans or projects, for the Chichester

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10.4. MARINE: SOLENT AND DORSET COAST SPA

10.4.1. **OVERVIEW**

- 10.4.1.1. Solent and Dorset Coast SPA is located on the south coast within the Channel. The site is approximately 255.2 nautical miles squared ('nmi²') 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 SPA 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.
- 10.4.1.2. 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 SPA. 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 SPA. 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 SPA.

10.4.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

- 10.4.2.1. Site-specific SACO is not currently available for the Solent and Dorset Coast SPA. As such, SACO available for the Chichester and Langstone Harbours SPA⁴⁵, which is adjacent to the SPA, has been used as a basis for the assessment.
- 10.4.2.2. Table 10.5 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	

Table 10.5 - SACO attributes screened in for assessment

⁴⁵<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)



Feature	Impact for which LSE could not be excluded	Equivalent attribute
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

10.4.2.3. 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.
- 10.4.2.4. 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.



10.4.3. 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 Table 10.6 below.
- 10.4.3.2. It is concluded that there will be no adverse effect on site integrity for the Solent and Dorset Coast SPA, either from the Proposed Development alone, or in combination with other plans or projects

Table 10.6 - Assessment of potential adverse effects on site integrity for the Solent and Dorset Coast SPA 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 disturbat (Garthe & Hüppop, 2 Within Langstone and colonies of little tern known to forage in re- breeding colonies, of Langstone Harbour (Proposed Developm HDD3) have potentiat foraging given its mo- sea. Of the three ons Kendall's Wharf is the breeding colony, locat from the Baker's Islat therefore disturb and unpredictable noise of However, these work industrialised setting duration (two hours f noise levels from the Baker's Island, given the distance is doubl associated with consist be noticeable above Langstone Harbour (2009). In the event the disturbed from foragi works within Langston sites are present else Harbours which will the Development. Given further away from litte considered that there onshore HDD works located above MHW4 Outside of Langstone Harbour. There is the be disturbed and dis events and visual dis activities at the marin



e scored as being of moderate ance and therefore displacement 2004; Bradbury *et al*., 2014).

nd Chichester Harbours, breeding a are present. Given that little terns are relatively close proximity to their onshore HDD works within the (see Chapter 3 Description of the nent for locations of HDD1, HDD2 and ial to displace this species during oderate sensitivity to disturbance at ashore HDD locations, HDD3 at the closest location to a little tern cated at a minimum distance of *c*.2 km and colony. Sheet piling at HDD3 may d displace foraging birds through events.

rks will be above MHWS in an already g. Vibro-hammering will be very short in for installation at each location) and e EMV at HDD3 will be *c.*40 dB at n that SPLs reduce by 6 dB each time bled. Noise and visual disturbance struction activities at HDD3 are will not e baseline levels of disturbance within (Cutts & Allen, 1999; Cutts et al., that little terns were temporarily ging in proximity to the onshore HDD one Harbour, other equivalent foraging sewhere in Chichester and Langstone be unaffected by the Proposed n that HDD1 and HDD2 are located ttle tern breeding colonies, it is re is no potential for impact from s at these locations, both of which are /S in an urban environment.

ne Harbour, little terns may be present re waters at the mouth of Langstone herefore potential for foraging birds to splaced by both unpredictable noise isturbance associated with construction ine HDD location off Eastney.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Vibro-hammering at in duration and noise pipe-driving machine SPLs will not be notion setting. Since little te whilst feeding (RPS, to any underwater no and pipe driving mach background underwater around the UK range Merchant <i>et al.</i> , 2016
					A single jack-up vess vessel, a crew transf may be present at th weeks, with a total of over this period. Gro between KP 1.0 and of up to 4 weeks. The levels of disturbance within the area.
					Given that the foragin nearshore waters up Parsons <i>et al.</i> , 2015) range will not impact that there may be up for the marine HDD v construction period of majority of these will terns.
					Furthermore, vessel are already high with on a daily basis (Cha Other Marine Users, use the Marine Cable to such levels of dist
					During operation, a w Cables would require Repairs will be under timeframe (weeks to disturbance and disp operation and mainter construction. Therefore, potential of



t the marine HDD location will be short be generated by the vibro-hammers and e will be non-percussive and airbourne ticeable above the baseline in this urban erns plunge dive to a maximum of 1 m b, 2011), it is considered that exposure noise resulting from the vibro-hammer achine will not be discernible above vater noise levels (median noise levels be from 81.5 to 95.5 dB re 1 μ Pa; 16).

ssel, together with a multicat, a safety offer vessel and up to four workboats he marine HDD location for up to 44 of 636 vessel movements predicted ounding of cable lay barges at low tide d KP 4.7 will occur over a short duration his will not be noticeable above baseline e from the existing high levels of traffic

ging range of little tern is restricted to p to c.10 km (Thaxter *et al.*, 2012; 5), construction activities beyond this ct this feature. Although it is anticipated p to c.825 vessel movements , including works, over the anticipated 30-month of the Proposed Development, the II be outside the foraging area of little

I traffic levels in the Channel and Solent th 300 to 400 vessels transiting the area hapter 13, Shipping, Navigation and s, APP-128). As such, little terns which ble Corridor to forage will be habituated sturbance.

worst-case failure rate of the Marine re repair once every 10-12 years. ertaken by a single vessel, over a short o months). Thus, the potential for placement effects on little tern during tenance would be less than during

disturbance and displacement from the nent alone will not result in an adverse

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					effect on the integrity this SPA. Potential effects resu temporal and spatial Development (Table highly localised and that there will be no
			0		alone or in combinat Appendix 1 PINS ma
		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 effect shellfish populations moderate sensitivity Hüppop, 2004; Brad (and therefore the pri- may be temporarily of resulting in effective visual foragers and a in turbidity which car sea surface. Activitie the potential to relea during cable installat Within Langstone Han numbers may be hig points of the drill are no pathway for the w suspended sedimen the works will not af in Langstone Harbou Outside of Langston HDD pits (KP 1.0-1.0 potential for the liber between KP 5 and 1 transport the finest s point. However, SSC mg/l) and therefore r which ranges from a areas. There will be of prey species at th disturbance and incr in duration and small Elsewhere within the foraging little tern de (Parsons <i>et al.</i> , 2015)



ty of little tern as a qualifying feature of

sulting from plans or projects which have al overlap with the Proposed e 4 of Appendix 3) are considered to be I temporary. As such, it is considered adverse effect on site integrity either ation with other project and plans (see natrices for further details).

ctively top predators of benthos, fish and is and are considered likely to be of y to habitat disturbance (Garthe & dbury *et al.*, 2014). If seabed habitats orey species) are disturbed, the area y 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 ease sediment into the water column ation and associated works.

Harbour where foraging little tern igh, HDD will be used. The entry/exit re expected to be onshore, thus there is works to result in an increase in nt or resultant smothering. Therefore, affect the availability of tern prey species bur.

ne 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 6C at these distances will be low (< 5 not discernible above natural variation, approximately <5 to 75 mg/l in coastal e no adverse effects on the availability of he Landfall since both habitat creases in SSC will be temporary, short all in extent.

e Marine Cable Corridor, where ensities are likely to be much lower 5), the area of disturbed habitat for anticipated to be a maximum of 3.6

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
Feature	Conservation Objectives	Effect	Attribute	Target	Assessment km² along the entire Breeding little tern ar KP 21 given their me 2.4 km; Thaxter et al. (KP 0 – 21), it is preding/I may be observent trench/HDD pit) and the persist for several hold construction activities be transported up to which point concentrates SSC is expected to reding following complexies are able to the sediment owing to free fluctuations in sedime background levels of already (Guillou et al.) During operation, with considered that there onshore nature of the Outside of Langstone be no permanent loss as a result of cable ne effect on prey available limited in spatial exteres. During operation, repunlikely, may be requirate of the Marine Cation-12 years. Cable references and uring considered that there on increases in SSC word use to the smaller set and the market of the Marine Cation and adverse aadverse effects as during considered that there on permanent loss as a result of cable ne effect on prey available limited in spatial exteres. During operation, repunctively, may be requirate of the Marine Cation and adverse aadverse effects as during considered the smaller set of



A Marine Cable Corridor (c.6%). are not expected to be present beyond bean-maximum foraging range ($6.3 \text{ km} \pm al.$, 2012). Within this nearshore area edicted that a peak SSC of up to 200 red locally (i.e. within 2 km of the cable at these concentrations could potentially hours 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 oletion of these activities. Most prey tolerate a degree of suspended requent exposure to storm induced nent concentrations, together with high of suspended sediment in the Solent al., 2017).

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

The Harbour during operation, there will ss of fish, shellfish and benthic habitat non-burial protection and no adverse ability since these measures will be tent (c.0.7 km²).

epair or replacement of cables, although quired. An indicative worst-case failure Cables could require a repair once every repair has the potential to have similar nstruction. However, the potential ould be lower than during construction scale of a repair, with works being of d more localised, which will not result in effect on site integrity.

ial for impact from reduced prey from seabed disturbance and rom the Proposed Development alone esult in an adverse effect on site

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

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					that there is no poter either alone or in cor (see Appendix 1 PIN
			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 by an increase in tur- prey. They are consi- habitat disturbance (associated with cons- works have the poter column during cable HDD pit excavation. However, since HDD Harbour, with an ons- suspended material Outside of Langstone HDD pits (KP 1.0-1.6 potential for the liber between KP 5 and 14 transport the finest s point. However, SSC mg/l) and therefore r which ranges from a areas. Elsewhere within the foraging little tern de (Parsons <i>et al.</i> , 2015 route preparation is a km ² along the entire Breeding little tern ar KP 21, given their me ± 2.4 km; Thaxter <i>et</i> (KP 0 – 21), it is prec- mg/l may be observed trench/HDD pit) and persist for several ho construction activities be transported up to which point concentr SSC is expected to r days following comp



ential for adverse effects on site integrity ombination with other project and plans INS matrices for further details).

al foragers and are likely to be affected urbidity which can make it harder to see sidered to be moderately sensitive to e (Bradbury *et al.*, 2014). Activities instruction, repair and maintenance tential to release sediment into the water le installation and associated works e.g. n.

DD will be used within Langstone inshore exit point, the volume of al is considered to be negligible. one Harbour, excavation at the marine 1.6), 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 SC at these distances will be low (< 5

e not discernible above natural variation, approximately <5 to 75 mg/l in coastal

ne UK Marine Cable Corridor, where lensities are likely to be much lower 15), the area of disturbed habitat for anticipated to be a maximum of 3.6 e Marine Cable Corridor (c.6%). are not expected to be present beyond mean-maximum foraging range (6.3 km et al., 2012). Within this nearshore area edicted that a peak SSC of up to 200 ved locally (i.e. within 2 km of the cable d these concentrations could potentially hours following completion of ies. Sediment plumes are also likely to to 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.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Most prey species ar suspended sediment induced fluctuations i with high background Solent already (Guillo During operation, rep unlikely, may be requ rate of the Marine Ca 10-12 years. Cable re effects as during con increases in SSC wo due to the smaller sc shorter duration and any adverse effect or As such, the potentia availability resulting f Proposed Developme effect on site integrity Potential effects result temporal and spatial Development (Table highly localised and the As such, it is consider on site integrity from water column from in combination with other 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 che occur during all deve potential to directly a through direct oiling r Unplanned disposal of development phases tern mortality through However, routine mit practice in terms of w prevention measures prevent these events that, in consideration no adverse effect on Given the scale and the projects and the requi-



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

epair or replacement of cables, although quired. An indicative worst-case failure cables could require a repair once every repair has the potential to have similar nstruction. However, potential

ould be lower than during construction cale of a repair, with works being of d more localised, which will not result in on site integrity.

ial for impacts from reduced prey from increased turbidity from the nent alone will not result in an adverse ty.

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

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

lered that there will be no adverse effect n impacts on prey species within the increased turbidity, either alone or in her project and plans (see Appendix 1 urther details).

emical spillages from vessels may elopment phases. Spills have the affect little terns utilising the sea surface resulting in mortality.

l of industrial or user plastic during all is also has the potential to cause little gh ingestion or entanglement.

itigation measures of standard best waste management, pollution as and strict navigational protocols will

is occurring and therefore it is predicted n of mitigation measures, there will be n site integrity for the project alone.

I nature of other potential plans and puirement to adhere to similar best which could contribute to in combination

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					effects, there will be combination with oth PINS matrices for fu
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 fish and shellfish po be of moderate sens Hüppop, 2004; Brad (and therefore the pi may be temporarily resulting in effective visual foragers and a in turbidity which can sea surface. Activitie the potential to relea during cable burial a Within Langstone Ha entry/exit points of th thus there is no path increase in suspend Therefore, the works species in Langston Outside of Langston HDD pits (KP 1.0-1.1) potential for the liber between KP 5 and 1 transport the finest s point. However, SSC mg/l) and therefore for which ranges from a areas. There will be prey species at the I and increases in SS and small in extent. Elsewhere within the foraging Sandwich to <i>al.</i> , 2014), the area of preparation is anticip along the entire Mar the predicted usage (2014), high densitie expected beyond KF



e no adverse effect on site integrity in ther plans and projects (see Appendix 1 further details).

e effectively top predators of benthos, opulations and are considered likely to nsitivity 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 l are likely to be affected by an increase an make it harder to see prey from the ties associated with construction have ease sediment into the water column and associated works.

Harbour, HDD will be used. The the drill are expected to be onshore, thway for the works to result in an ided sediment or resultant smothering. ks are not predicted to affect tern prey ne Harbour.

ne Harbour, excavation at the marine 1.6), 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 SC at these distances will be low (< 5 e not discernible above natural variation, approximately <5 to 75 mg/l in coastal e no adverse effects on the availability of a Landfall since both habitat disturbance SC will be temporary, short in duration

he Marine Cable Corridor, where tern densities may be lower (Wilson *et* a of disturbed habitat for route cipated to be a maximum of 3.6 km² arine Cable Corridor (c.6%). Based on e distributions presented in Wilson *et al.*, ties of breeding Sandwich terns are not KP 21. Within the area of highest use (KP

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					0-21), it is predicted be observed locally (trench/HDD pit) and persist for several ho construction activities be transported up to which point concentr SSC is expected to r days following comp Most prey species an suspended sediment induced fluctuations with high background
					Solent already (Guill During operation, wit considered that there onshore nature of the Outside of Langstone be no adverse effect a result of cable non measures will be lim
					During operation, rep unlikely, may be requ rate of the Marine Ca 10-12 years. Cable r effects as during cor increases in SSC wo due to the smaller so shorter duration and any adverse effect of As such, the potentia
					availability resulting increased turbidity fr will not result in any
					Potential effects result temporal and spatial Development (Table highly localised and that there is no poten from in combination Appendix 1 PINS ma



d that a peak SSC of up to 200 mg/l may (i.e. within 2 km of the cable d these concentrations could potentially hours following completion of ies. Sediment plumes are also likely to to 5 km from the cable trench/HDD pit at htrations of 5 to 10 mg/l are predicted; o return to background levels within a few appletion of these activities.

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

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

one Harbour during operation, there will ct on the availability of prey species as on-burial protection since these mited in spatial extent (c.0.7 km²).

epair or replacement of cables, although quired. An indicative worst-case failure Cables could require a repair once every e repair has the potential to have similar onstruction. However, potential vould be lower than during construction scale of a repair, with works being of ad more localised, which will not result in on site integrity..

tial for effects from reduced prey g from seabed disturbance and from the Proposed Development alone g adverse effect on site integrity.

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

Feature	Conservation Objectives	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.	Sandwich terns are v 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 onsi suspended material is 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, SSC mg/l) and therefore n
					which ranges from ap areas.Elsewhere within the foraging Sandwich te
					lower (Wilson <i>et al.</i> , 2 route preparation is a km ² along the entire I on the predicted usag
					al., (2014), high dens not expected beyond (KP 0-21), it is predic may be observed loca
					trench/HDD pit) and t persist for several hor construction activities be transported up to s which point concentra SSC is expected to re
					days following completed Most prey species are suspended sediment induced fluctuations i with high background Solent already (Guillo
					During operation, rep unlikely, may be requ



visual foragers and are likely to be ase 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 in during cable installation and g. HDD pit excavation.

D will be used within Langstone shore exit point, the volume of 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 C at these distances will be low (< 5 not discernible above natural variation, approximately <5 to 75 mg/l in coastal

e Marine Cable Corridor, where tern densities are likely to be much 2014), the area of disturbed habitat for anticipated to be a maximum of 3.6 Marine Cable Corridor (*c*.6%). Based age distributions presented in Wilson et sities of breeding Sandwich terns are d KP 21. Within the area of highest use icted that a peak SSC of up to 200 mg/l cally (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 trations of 5 to 10 mg/l are predicted; return to background levels within a few pletion of these activities.

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

epair or replacement cables, although quired. An indicative worst-case failure

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					rate of the Marine C 10-12 years. Cable effects as during con increases in SSC we due to the smaller s shorter duration and any adverse effect of As such, the potenti a result of the Propo in any adverse effect Potential effects res temporal and spatia Development (Table highly localised and As such, it is conclu adverse effects on s on prey species with PINS matrices for fu
		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 occur during all deve potential to directly a surface through dire Unplanned disposal development phases Sandwich tern morta However, routine mi practice in terms of v prevention measures prevent these event predicted that, in con there will be no adve Proposed Project all Given the scale and projects and the req practice measures w effects, it is predicted
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 e and shellfish popula moderate sensitivity Hüppop, 2004; Brad (and therefore the pr may be temporarily o



- Cables could require a repair once every repair has the potential to have similar onstruction. However, potential
- vould be lower than during construction scale of a repair, with works being of id more localised, which will not result in on site integrity.
- tial for effects from increased turbidity as posed Development alone will not result ects on site integrity.
- sulting from plans or projects which have al overlap with the Proposed
- le 4 of Appendix 3) are considered to be d temporary.
- uded that there is no potential for site integrity from in combination effects thin the water column (see Appendix 1 further details).
- nemical spillages from vessels may velopment phases. Spills have the affect Sandwich terns utilising the sea rect oiling resulting in mortality. al of industrial or user plastic during all es also has the potential to cause tality through ingestion or entanglement. nitigation measures of standard best f waste management, pollution es and strict navigational protocols will nts occurring and therefore it is onsideration of mitigation measures, verse effects on site integrity from the alone.
- d nature of other potential plans and quirement to adhere to similar best which could contribute to in combination red that there will be no adverse effect on abination with other plans and projects.
- effectively top predators of benthos, fish ations and are considered likely to be of y to habitat disturbance (Garthe & dbury *et al.*, 2014). If seabed habitats prey species) are disturbed, the area y devoid of any potential food sources,

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					resulting in effective I visual foragers and a in turbidity which can sea surface. Activities the potential to releas during cable installati Within Langstone Ha entry/exit points of the thus there is no pathy increase in suspende Therefore, the works species in Langstone 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, SSC mg/l) and therefore n which ranges from ap areas. There will be r prey speciesble since increases in SSC will small in extent. Elsewhere within the foraging common tern <i>al.</i> , 2014), the area o preparation is anticip along the entire Marin common tern are not in high densities, give range (15.2 km ± 11.1 nearshore area (KP 0 of up to 200 mg/l may of the cable trench/H could potentially pers completion of constru- also likely to be trans trench/HDD pit at wh are predicted; SSC is levels within a few da activities. Most prey species an suspended sediment



e habitat loss. Furthermore, terns are are likely to be affected by an increase an make it harder to see prey from the es associated with construction have ase sediment into the water column ation and associated works.

larbour, HDD will be used. The the drill are expected to be onshore, hway for the works to result in an ded sediment or resultant smothering. as are not predicted to affect tern prey the Harbour.

ne 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 C at these distances will be low (< 5 not discernible above natural variation, approximately <5 to 75 mg/l in coastal e no adverse effects on the availability of ce both habitat disturbance and vill be temporary, short in duration and

e Marine Cable Corridor, where ern densities may be lower (Wilson et of disturbed habitat for route ipated to be a maximum of 3.6 km² rine Cable Corridor (*c*.6%). Breeding ot expected to be present beyond KP 21 ven their mean-maximum foraging 1.2 km; 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 rsist for several hours following ruction activities. Sediment plumes are sported up to 5 km from the cable hich point concentrations of 5 to 10 mg/l is expected to return to background lays following completion of these

are able to tolerate a degree of nt owing to frequent exposure to storm

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					induced fluctuations with high background Solent already (Guille During operation, with considered that there onshore nature of the Outside of Langstone be no adverse effect prey availability since spatial extent (c.0.7 H During operation, rep unlikely, may be requ rate of the Marine Ca 10-12 years. Cable re effects as during com increases in SSC wo due to the smaller so and the more localise effects on site integri As such, the potentia availability resulting f increased turbidity fre is not considered to r integrity. Potential effects resu temporal and spatial Development (Table highly localised and the As such, it is consider effects on site integri projects on prey availability resulting f
			Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	for further details). 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



s in sediment concentrations, together nd levels of suspended sediment in the llou *et al*., 2017).

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

the Harbour during operation, there will at as a result of non-burial protection on the these measures will be limited in km²).

epair or replacement of cables, although quired. An indicative worst-case failure Cables could require a repair once every repair has the potential to have similar nstruction. However, potential ould be lower than during construction scale of a repair, the shorter duration sed nature of work, with no adverse rity.

ial for effects from reduced prey from seabed disturbance and rom the Proposed Development alone result in any adverse effects on site

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

lered that there will be no adverse rity in combination with other plans and ailability (see Appendix 1 PINS matrices

visual foragers and are likely to be ase 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 in during cable installation and .g. HDD pit excavation.

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

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Outside of Langstone HDD pits (KP 1.0-1.6 potential for the liberal between KP 5 and 18 transport the finest se point. However, SSC mg/l) and therefore n which ranges from ap areas. Elsewhere within the foraging common tern (Wilson <i>et al.</i> , 2014), preparation is anticip along the entire Marin common tern are not in high densities, give range (15.2 km ± 11. nearshore area (KP 0 of up to 200 mg/l may of the cable trench/H could potentially pers completion of constru- also likely to be trans- trench/HDD pit at wh are predicted; SSC is levels within a few da activities. Most prey species an suspended sediment induced fluctuations is with high background Solent already (Guillo During operation, rep unlikely, may be requ- rate of the Marine Ca 10-12 years. Cable re effects as during con increases in SSC wo due to the smaller sc and the more localise effect on site integrity As such, the potential



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 C at these distances will be low (< 5 not discernible above natural variation, approximately <5 to 75 mg/l in coastal

e Marine Cable Corridor, where ern densities are likely to be much lower), the area of disturbed habitat for route pated to be a maximum of 3.6 km² rine Cable Corridor (c.6%). Breeding ot expected to be present beyond KP 21 ven their mean-maximum foraging .2 km; 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 rsist for several hours following ruction activities. Sediment plumes are sported up to 5 km from the cable hich point concentrations of 5 to 10 mg/l is expected to return to background lays following completion of these

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

epair or replacement of cables, although quired. An indicative worst-case failure cables could require a repair once every repair has the potential to have similar nstruction. However, potential ould be lower than during construction scale of a repair, the shorter duration sed nature of work, with no adverse ty.

ial for effects from increased turbidity Development alone will not result in any site integrity.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Potential effects result temporal and spatial Development (Table highly localised and As such, it is conside effects on site integr species within the wa (see Appendix 1 PIN
		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 occur during all deve potential to directly a surface through direc Unplanned disposal development phases common tern mortali
					However, routine mit practice in terms of v prevention measures prevent these preven it is concluded that, i measures, there will
					Given the scale and projects and the requ practice measures w effects, it is conclude on site integrity alone and 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 habitats. High turbidi in warmer months. L impacts on key prey can adversely affect qualifying feature fee Activities associated maintenance works h and increase turbidit associated works. However, since HDD Harbour, with an ons suspended material Outside of Langston HDD pits (KP 1.0-1.6 potential for the liber



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

dered that there will be no adverse grity from in combination effects on prey water column from increased turbidity INS matrices for further details).

nemical spillages from vessels may velopment phases. Spills have the affect common terns utilising the sea ect oiling resulting in mortality. al of industrial or user plastic during all es also has the potential to cause ality through ingestion or entanglement. nitigation measures of standard best waste management, pollution es and strict navigational protocols will entthese events occurring and therefore , in consideration of mitigation ill be no adverse effects on site integrity. d nature of other potential plans and quirement to adhere to similar best which could contribute to in combination ded that there will be no adverse effect ne or in combination with other plans

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

ed with construction, repair and s have the potential to release sediment lity during cable installation and

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

ne Harbour, excavation at the marine 1.6), and cable installation (due to the eration and dispersal of fines identified

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					between KP 5 and 1 transport the finest s point. However, SSC mg/l) and therefore r which ranges from a areas.
					Elsewhere within the disturbed habitat for maximum of 3.6 km ² Corridor (c.6%). It is 200 mg/l may be obs cable trench/HDD pit potentially persist for construction activities be transported up to which point concentr SSC is expected to r days following comp species are able to to sediment owing to fro fluctuations in sedim background levels of already (Guillou <i>et al</i>
					During operation, rep unlikely, may be requ rate of the Marine Ca 10-12 years. Cable r effects as during cor in SSC would be low smaller scale of a re works and the more adverse effects on s
					As such, the potentia the water column res Proposed Developm effects on site integri Potential effects resu temporal and spatial Development (Table
					highly localised and As such, it is conside effects on site integr



15, and in other isolated locations) will sediments up to 10 km from the release SC at these distances will be low (< 5 a not discernible above natural variation, approximately <5 to 75 mg/l in coastal

ne Marine Cable Corridor, the area of r route preparation is anticipated to be a ² along the entire Marine Cable is predicted that a peak SSC of up to oserved locally (i.e. within 2 km of the bit) and these concentrations could or several hours following completion of ies. Sediment plumes are also likely to to 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. Most prey tolerate a degree of suspended frequent exposure to storm induced ment concentrations, together with high of suspended sediment in the Solent *al.*, 2017).

epair or replacement of cables, although quired. An indicative worst-case failure Cables could require a repair once every e repair has the potential to have similar onstruction, however, potential increases ower than during construction due to the repair project, the shorter time-span of e localised focus of work, with no site integrity.

tial for impact on key prey species within esulting from a drop in DO from the ment alone will not result in any adverse grity.

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

le 4 of Appendix 3) are considered to be d temporary.

dered that there will be no adverse grity from in combination effects on prey

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					species within the wa Appendix 1 PINS ma
			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, suc clogging the filtering of This in turn can adve suitability of qualifying associated with const the potential to release during cable installati However, since HDD
					Harbour, with an onsi suspended material is 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, SSC mg/l) and therefore n which ranges from ap
					areas. Elsewhere within the disturbed habitat for r maximum of 3.6 km ² (c.6%). It is predicted may be observed loca trench/HDD pit) and t persist for several ho construction activities be transported up to
					which point concentra SSC is expected to re days following compl species are able to to sediment owing to fre fluctuations in sedime background levels of already (Guillou <i>et al</i>



vater column from a drop in DO (see natrices for further details).

se in turbidity through sediment release otential implications for prey species in such as affecting fish health and g organs of suspension feeding animals. versely affect the availability and ing feature feeding habitat. Activities instruction and maintenance works have ease sediment and increase turbidity ation and associated works.

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

The Harbour, excavation at the marine (1.6), 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 SC at these distances will be low (< 5 e not discernible above natural variation, approximately <5 to 75 mg/l in coastal

he Marine Cable Corridor, the area of r route preparation is anticipated to be a ² along the entire Marine Cable Corridor ed that a peak SSC of up to 200 mg/l cally (i.e. within 2 km of the cable these concentrations could potentially ours 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. Most prey tolerate a degree of suspended requent exposure to storm induced nent concentrations, together with high of suspended sediment in the Solent *al*., 2017).

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					During operation, re although unlikely, m case failure rate of t once every 10-12 ye have similar effects potential increases i construction due to t duration and the mo adverse effects on s As such, the potentia the water column re Proposed Developm effects on site integr Potential effects res temporal and spatia Development (Table highly localised and As such, it is consid effects on site integr increased turbidity fr 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 occur during all deve potential to directly a column through a ra disposal of industria phases also has the ingestion or entangle However, routine mi practice in terms of prevention measure prevent these events concluded that, in co there will be no adve Given the scale and projects and the req practice measures w effects, it is predicte

Conclusion: No 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 SPA.



epair or replacement of cables failure, nay be required. An indicative worstthe Marine Cables could require a repair years. Cable repair has the potential to as during construction However,

in SSC would be lower than during the smaller scale of a repair, the shorter ore localised nature of work, with no site integrity.

tial for impact on key prey species within esulting from increased turbidity from the ment alone will not result in any adverse grity.

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

le 4 of Appendix 3) are considered to be d temporary.

dered that there will be no adverse grity from in combination effects of from other plans and projects (see natrices for further details).

nemical spillages from vessels may velopment phases. Spills have the affect prey species within the water range of biological effects. Unplanned al or user plastic during all development e potential to affect prey species through glement.

nitigation measures of standard best f waste management, pollution es and strict navigational protocols will nts occurring and therefore it is consideration of mitigation measures, verse effects on site integrity.

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.

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10.5. ONSHORE AND MARINE: PORTSMOUTH HARBOUR SPA/RAMSAR SITE

10.5.1. **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. MARINE CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.5.2.1. Site-specific SACO is available for the Portsmouth Harbour SPA⁴⁶. Table 10.7 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.1 – Marine 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;

⁴⁶https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9011051&SiteName=portsmouth

harbour&SiteNameDisplay=Portsmouth+Harbour+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCA Area=&NumMarineSeasonality=4 (Accessed August 2020)

- 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.

10.5.3. ONSHORE CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES)

10.5.3.1. Table 10.8 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 10.8 – OnshoreSACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Dark-bellied brent goose	Disturbance and displacement	Disturbance caused by human activity
Dark-bellied brent goose Dunlin Black-tailed godwit	Accidental spills and Litter	Supporting habitat: food availability
Supporting habitat (freshwater and coastal grazing marsh)	Indirect effects	Supporting habitat: extent and distribution of supporting habitat for the non-breeding season
	Accidental spills and Litter	Supporting habitat: food availability

10.5.4. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.5.4.1. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10.9 below.
- 10.5.4.2. Following the application of standard best practice mitigation measures, no 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 10.9 – Marine 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 through However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occu- in consideration of mitigation measures, site integrity from the Proposed Develop 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 throu However, routine mitigation measures of waste management, pollution prevention protocols will prevent events occurring a predicted that, in consideration of mitigate adverse effects on site integrity from the 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

Conclusion: Following the application of standard best practice mitigation measures, no 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 curring and therefore it is predicted that, s, there will be no adverse effects on opment alone.

tential plans and projects and the practice measures which could is predicted that there will be no adverse vith 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 ough ingestion or entanglement.

of standard best practice in terms of on measures and strict navigational and occurringand therefore it is gation measures, there will be no he Proposed Development alone.

tential 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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Table 10.10 – Onshore 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
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.	 Dark-bellied brent goose is considered to (Cutts <i>et al.</i>, 2013). Therefore, construct works in Langstone Harbour and Onshot to SWBGS sites have the potential to dis roosting and foraging components of the setting of the Proposed Development (S Owens (1977) describes the effects of an geese wintering on the Essex coast near Airport at Maplin Sands. The report cond became habituated to most sounds, but gunshots from wildfowlers, usually put th shots of the day at nearby army gunnery area, but they quickly returned and ignor Extremely loud but regular bangs made little reaction after the first few weeks. Specific surveys for this species for the F notable numbers in both intertidal and te Study Area (APP-421). Furthermore, giv Proposed Development, construction an considered to have the potential to displa from favoured foraging and roosting hab events. Construction work within the SW of grassland foraging habitat where the owinter season when dark-bellied brent ge qualifying features of the SPA are presel al. 2019). Work within the sites during with the sites as foraging areas. The following SV components of the Proposed Development. P23B – University of Portsmouth, Lang P23B – University of Portsmouth, Lang P23R – Milton Common north 1; P23R – Milton Common north 2; P11 – Kendall's Wharf playing fields.



to be of high sensitivity to disturbance ction activities associated with HDD ore Cable Route works in and adjacent listurb dark-bellied brent geese at both eir daily cycle despite the industrial SWBGS Steering Group, 2018). anthropogenic disturbances on brent ar the site of the then proposed London ncluded that brent geese quickly it unexpected sounds, such as nearby the geese to flight. Similarly, the first ry ranges caused the birds to leave the ored all subsequent firings for that day. e during nearby weapon testing caused

Proposed Development recorded errestrial (i.e. SWBGS) areas of the iven the proximity of these areas to the nd decommissioning works are blace wintering dark-bellied brent goose bitat through unpredictable noise NBGS sites will reduce the availability construction stage overlaps with the geese and other wintering birds that are ent, October to March (Carboneras et winter would produce direct disturbance of construction vehicles and bility of remaining grassland within the SWBGS sites overlap with onshore nent:

gstone Campus;

: and

ichester and Langstone Harbour SPA ity will be avoided by restricting works

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					within the winter season, defined as Octor qualifying species such as dark-bellied by grounds (Snow and Perrins, 1998). A def restrictions were provided in Chapter 16: 16.14: Winter Working Restriction for Fea Harbours SPA (APP-421) and then subject with Natural England which are captured CEMP (APP-505 Rev002) <u>Rev004</u>). The incorporated into working methods: .
					 Principle 1: Construction works can categorised as either core, primary su candidate) sites that overlap with the during October – March. An exception that is already disturbed by movemen no functional habitat for brent geese Chichester and Langstone Harbour SI
					 Principle 2: Where HDD works are t site (e.g. at Eastney Landfall) no direc the restriction does not apply.
					 Principle 3: Elements of the Onshore the SPA are not included in any restrict
					Principle 4: Construction noise event
					 Principle 5: Construction works of 55 to a major road and/or adjacent to in dB) of existing noise can be underta noise levels from the Proposed Dev instances.
					 Principle 6: Percussive piling or work resulting in a noise level in excess of 69 receptor) should be avoided during the to March inclusive. The sensitive rece any SPA supporting habitat (e.g. high
					Adoption of Principle 1 (and reference to on those SWBGS sites that lie within the these sites will not be subject to works in by SPA birds), and effects of noise and v



ctober to March (the period when SPA brent goose arrive from their breeding letailed overview of the working 6: Onshore Ecology and Appendix features of Chichester & Langstone oject to revisions following consultation ed in the updated Outline Onshore here are six principles that will be

cannot take place in SWBGS (those support, secondary support, low use or e Proposed Developments Order Limits on is the gravel car park within site P11 ents of cars, lorries and plant, and offers se or other waterbirds associated with SPA.

e to take place underneath the SWBGS ect impacts are considered to occur and

re Cable Route that are over 400 m from rrction.

nts of <55 dB can occur unrestricted.

55 – 72 dBLAmax immediately adjacent industrial sites with notable levels (>60 taken unrestricted. It is considered that evelopment would be masked in these

works with heavy machinery (i.e. plant 69dbLAmax – measured at the sensitive he bird overwintering period (i.e. October ceptor is the nearest point of the SPA or ph tide roosting site).

to Principle 2) will offset direct effects the Order Limits as detailed above (as in the winter period when they are used I vibration on birds within the SPA itself.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Adoption of Principle 1 (and reference to no adverse effects on those SWBGS site detailed above (as these sites will not be when they are used by SPA birds), and e within the SPA itself.
					Trenching / road saw noise at 69dbLAma SWBGS sites. However, SWBGS sites F affected due to the minimal overlap of the dB from trenching / road saw works. It is are situated between the construction wo buffer the noise so that in reality, there w consequence, these two sites are exclude the remaining 12 sites and adjacent area likely that Principle 5 applies in this highl work is restricted during October – March
					The percussive activities at HDD component are anticipated to comprise the insertion mounted vibrator at HDD-1, HDD-2, HDD the reception pit at HDD-4.
					In accordance with the requirements of t m high around the perimeter of the HDD purpose of noise mitigation. <u>Example scr</u> plate 6.1 of the OOCEMP (APP-505 Rev
					affords has been included in 3D noise m proximity to the SWBGS sites. Construct <u>LAmax</u> as a result of this screening only HDD-4 and HDD-6.
					The SPA is in an urban setting and recend disturbance does not have a significant in close to conurbations (Goss-Custard et a perimeter of HDD compounds will however indistinguishable levels regardless of the
					With the combination of the seasonal rest the potential effects on dark-bellied bren displacement from the Proposed Develo adverse effect on site integrity.
					Potential effects resulting from the limited temporal and spatial overlap with the Pro APP-424) are considered to be localised



to Principle 2) will ensure that there are ites that lie within the Order Limits as be subject to works in the winter period d effects of noise and vibration on birds

nax has the potential to affect fourteen P54 and P29 will not be adversely the site areas with noise exceeding 69 is also considered that the buildings that works and SWBGS sites will effectively will be no overlap of noise effects. In uded from the restriction. In relation to eas of the SPA, although it considered hly urbanised environment, construction rch.

ounds in proximity to the SWBGS sites n of sheet piles via an excavator DD-3 and HDD-6 and via a piling rig for

the OOCEMP, screening of at least 2 D compounds is required for the <u>creening solutions are presented in</u> <u>ev004).</u> The benefit this screening modelling for the HDD works in ction noise at over <u>69dbLAmax 69db</u> y occurs outside of the compounds for

ent research has established that visual t impact on waterbirds in an estuary t al., 2019). The screening at the ever also reduce visual disturbance to the baseline environment.

estriction and noise-mitigation measures nt goose resulting from disturbance and opment alone will not result in an

ted plans or projects which have Proposed Development (APP-423 and ed and temporary.

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					The North Portsea Island Coastal Flood Coastline Between Milton Common and (19/01368/FUL) includes a full winter wo will not disturb dark-bellied brent goose. by other plans or projects identified as p features of the SPA or SWBGS, as outli the ES (APP-423 and APP-424). Potent Development Order Limits and mitigation Coastal Flood Defence Scheme Phase 4 option around Milton Common is taken. measures do not form part of the propos provided in connection with the planning 19/01368/FUL as per the most recent do relevant planning conditions. As such, it is considered that there is no integrity from disturbance and displacem with other project and plans (for full deta and integrity matrices for the SPA and A
		Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (e.g. <i>Zostera, Enteromorpha</i> ,	Unplanned oil or chemical spillages may decommissioning phases. Spills have th bellied brent geese utilising intertidal and mortality. Unplanned disposal of industri and decommissioning phases also has t brent goose mortality through ingestion of



bd Defence Scheme, Phase 4B nd Kendall's Wharf Eastern Road working restriction (October – March) so e. Such restrictions have been adopted potentially affecting wintering bird itlined in Appendices 16.15 and 16.16 of ntial overlap between the Proposed ion areas for the North Portsea Island e 4b would occur if the southern route n. However, those compensation osed mitigations/compensations to be ng permission with reference documents submitted to discharge the

no potential for adverse effects on site ement, either alone or in combination tails see Appendix 1 for the screening Appendix 5 for the Ramsar site).

ay occur during the construction and the potential to directly affect darkand other supporting habitats resulting in strial or user plastic during construction s the potential to cause dark-bellied n or entanglement. However, routine

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Ulva lactuca, Spergularia, Puccinellia, Triglochin, Aster trifolium, Plantago, Salicornia spp, Agrostis stolonifera, Lolium perenne, Trifolium	mitigation measures of standard best pra pollution prevention measures (see Cha Resources of the ES APP-142) will ensu and will therefore not result in an advers 27 are summarised in the Onshore Outli and detail incorporating a Materials Man
repens) at preferred sizes.	 Management Plan ('SWMP'). The key m Identify the volume of waste streams to establish the potential for reuse at Identify possible options for waste to Identify opportunities for waste minint Identify the most significant opportunates; Identify suitable waste management licences, permits, waste transfer not notes; and Consider appropriate site practice segregated and the measures that wis site operative for waste reduction, re Best practice recommendations for the poutlined in more detail in a detailed ICEM undertaken and agreed with relevant aur construction works. Measures detailed in and further captured in the Onshore Out include: Designated areas for the storage chemicals; On-site availability of oil spill clear material and inflatable booms for use Use of drip trays under mobile plant; Drain socks to trap sediment enterin Therefore, it is considered that potential resulting from accidental spills and/or litt alone will not result in an adverse effect



practice in terms of waste management, apter 27: Waste and Material sure that these events are prevented rse effect. Measures detailed in Chapter tline CEMP (APP-505 <u>Rev002Rev004</u>) anagement Plan ('MMP') and Site Waste matters of the SWMP are to:

is likely to be produced during the works and recycling;

to be 'designed out;

imisation and management;

unities to increase re-use and recycling

ent contractors and record appropriate otes and hazardous waste consignment

ces such as how materials will be will be used for raising awareness among reuse and recycling.

Prevention of contamination will be EMP specific to the works to be uthority prior to commencement of in Chapter 19: Groundwater (APP-134) utline CEMP (APP-505 Rev002<u>Rev004</u>)

e of hazardous materials, fuels and

ean-up equipment including absorbent se in the event of an oil spill or leak;

t; and

ng the watercourse.

al effects on dark-bellied brent goose tter from the Proposed Development t on site integrity.

ed plans or projects which have roposed Development (APP-423 and

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					APP-424) plus the North Portsea Island Phase 4B - Coastline Between Milton C Road (19/01368/FUL), are considered to Given the requirement to adhere to simil contribute to in combination effects, it is for adverse effects on site integrity from or in combination with other project and for the screening and integrity matrices Ramsar site).
Dunlin	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (eg. <i>Nereis, Macoma,</i> <i>Hydrobia, Crangon,</i> <i>Carcinus,</i> dipertan flies, beetles, caddisfly, wasps, sawflies, mayflies) at preferred sizes.	 Unplanned oil or chemical spillages may decommissioning phases. Spills have the bellied brent geese utilising intertidal and mortality. Unplanned disposal of industriand decommissioning phases also has a brent goose mortality through ingestion mitigation measures of standard best pripollution prevention measures (see Char Resources of the ES APP-142) will ensure and will therefore not result in an adverse 27 are summarised in the Onshore Outliand detail incorporating a Materials Mar Management Plan ('SWMP'). The key more identify the volume of waste streams to establish the potential for reuse and identify opportunities for waste minime identify the most significant opportunitates; Identify suitable waste management plan ('Sump'). The key more is a significant opportunities for waste the interference of the most significant opportunitates for waste minime is the operative for waste transfer not notes; and Consider appropriate site practice segregated and the measures that we site operative for waste reduction, reduction in more detail in a detailed ICER undertaken and agreed with relevant aut construction works. Measures detailed is supported and the measures in the potential operative for waste management we show the relevant aut construction works. Measures detailed is the potential operative for waste management and state and the measures detailed is the potential operative for waste reduction, reduction works.



d Coastal Flood Defence Scheme, Common and Kendall's Wharf Eastern to be localised and temporary.

nilar best practice measures which could is considered that there is no potential m accidental spills and litter, either alone d plans (for full details see Appendix 1 s for the SPA and Appendix 5 for the

ay occur during the construction and the potential to directly affect darkand other supporting habitats resulting in strial or user plastic during construction is the potential to cause dark-bellied in or entanglement. However, routine practice in terms of waste management, hapter 27: Waste and Material sure that these events are prevented erse effect. Measures detailed in Chapter atline CEMP (APP-505 <u>Rev002</u><u>Rev004</u>) anagement Plan ('MMP') and Site Waste matters of the SWMP are to:

ns likely to be produced during the works and recycling;

to be 'designed out;

nimisation and management;

tunities to increase re-use and recycling

ent contractors and record appropriate notes and hazardous waste consignment

ices such as how materials will be will be used for raising awareness among reuse and recycling.

e prevention of contamination will be EMP specific to the works to be authority prior to commencement of I in Chapter 19: Groundwater (APP-134)

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					and further captured in the Onshore Out include:
					 Designated areas for the storage chemicals;
					On-site availability of oil spill clear material and inflatable booms for use
					Use of drip trays under mobile plant;
					Drain socks to trap sediment enterin
					Therefore, it is considered that potential resulting from accidental spills and/or litt alone will not result in an adverse effect
					Potential effects resulting from the limite temporal and spatial overlap with the Pro APP-424) plus the North Portsea Island Phase 4B - Coastline Between Milton Co Road (19/01368/FUL), are considered to
					Given the requirement to adhere to simil contribute to in combination effects, it is for adverse effects on site integrity from or in combination with other project and for the screening and integrity matrices to Ramsar site).
Black-tailed godwit	Maintaining or restoring the populations of qualifying features, and the distribution of qualifying features within the site.	Accidental spills and Litter	Supporting habitat: food availability	Maintain the distribution, abundance and availability of key food and prey items (eg. earthworm, leatherjacket, chironomids, <i>Macoma</i> , <i>Cardium</i> , <i>Nereis</i>) at preferred sizes.	Unplanned oil or chemical spillages may decommissioning phases. Spills have the bellied brent geese utilising intertidal and mortality. Unplanned disposal of industri and decommissioning phases also has to brent goose mortality through ingestion of mitigation measures of standard best pra- pollution prevention measures (see Cha- Resources of the ES APP-142) will ensu- and will therefore not result in an advers 27 are summarised in the Onshore Outli- and detail incorporating a Materials Man- Management Plan ('SWMP'). The key m
					 Identify the volume of waste streams to establish the potential for reuse and



outline CEMP (APP-505 Rev002<u>Rev004</u>)

ge of hazardous materials, fuels and

ean-up equipment including absorbent use in the event of an oil spill or leak;

nt; and

ing the watercourse.

al effects on dark-bellied brent goose litter from the Proposed Development ct on site integrity.

ited plans or projects which have Proposed Development (APP-423 and Id Coastal Flood Defence Scheme, Common and Kendall's Wharf Eastern to be localised and temporary.

nilar best practice measures which could is considered that there is no potential m accidental spills and litter, either alone d plans (for full details see Appendix 1 s for the SPA and Appendix 5 for the

ay occur during the construction and the potential to directly affect darkand other supporting habitats resulting in strial or user plastic during construction s the potential to cause dark-bellied n or entanglement. However, routine practice in terms of waste management, hapter 27: Waste and Material sure that these events are prevented erse effect. Measures detailed in Chapter utline CEMP (APP-505 <u>Rev002Rev004</u>) anagement Plan ('MMP') and Site Waste matters of the SWMP are to:

ns likely to be produced during the works and recycling;

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					 Identify possible options for waste to I
					 Identify opportunities for waste minimit
					 Identify the most significant opportun rates;
					 Identify suitable waste management licences, permits, waste transfer note notes; and
					 Consider appropriate site practices segregated and the measures that will site operative for waste reduction, reu
					Best practice recommendations for the pr outlined in more detail in a detailed CEM undertaken and agreed with relevant auth construction works. Measures detailed in and further captured in the Onshore Outli include:
					 Designated areas for the storage chemicals;
					 On-site availability of oil spill clear material and inflatable booms for use
					Use of drip trays under mobile plant; a
					Drain socks to trap sediment entering
					Therefore, it is considered that potential erresulting from accidental spills and/or litter alone will not result in an adverse effect or
					Potential effects resulting from the limited temporal and spatial overlap with the Pro APP-424) plus the North Portsea Island C Phase 4B - Coastline Between Milton Co Road (19/01368/FUL), are considered to
					Given the requirement to adhere to simila contribute to in combination effects, it is c for adverse effects on site integrity from a or in combination with other project and p



- to be 'designed out;
- imisation and management;
- unities to increase re-use and recycling

ent contractors and record appropriate otes and hazardous waste consignment

ces such as how materials will be vill be used for raising awareness among euse and recycling.

prevention of contamination will be MP specific to the works to be uthority prior to commencement of in Chapter 19: Groundwater (APP-134) utline CEMP (APP-505 Rev002<u>Rev004</u>)

e of hazardous materials, fuels and

ean-up equipment including absorbent se in the event of an oil spill or leak;

- t; and
- ng the watercourse.

al effects on dark-bellied brent goose tter from the Proposed Development at on site integrity.

ed plans or projects which have roposed Development (APP-423 and d Coastal Flood Defence Scheme, Common and Kendall's Wharf Eastern to be localised and temporary.

ilar best practice measures which could s considered that there is no potential n accidental spills and litter, either alone d plans (for full details see Appendix 1

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					for the screening and integrity matrices f Ramsar site).
Supporting habitat (freshwater and coastal grazing marsh)	Maintaining or restoring the extent, distribution, structure, function and supporting processes of the habitats of the qualifying features	Indirect effects	Supporting habitat: extent and distribution of supporting habitat for the non- breeding season	Restore the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non- breeding/wintering period (moulting, roosting, loafing, feeding)	 No habitat within the SPA/Ramsar site witemporary basis as a result of onshore cactivities. Several SWBGS sites do howen namely: P08A, P11, P23A, P23B and P2 fundamental importance to over-wintering SWBGS can be said to be functionally life (SPA) network including Chichester and site. Construction work within these sites will varying extents which would impact the aresource to dark-bellied brent goose. Restoration measures will be implement sward re-established to provide a suitable brent geese return to the Solent to winter the following two approaches are considered. Re-seeding. Reinstate areas within S of May where practicable. This is the set of the set of
					available within the summer growing sea not likely to be the optimal technique after works after this month, re-turfing would k including details of site preparation, esta in the revised Onshore Outline CEMP (A P211, P23A and P23 R will be subject to appropriate timescales to allow reestablic subject to either re-seeding or re-turfing. Components of P08A will not be restore
					no construction activities will take place of winter season so that visual and noise d not impact brent geese. National census Ornithology (BTO) through their Wetland that numbers present in England during those during the peak month of January.



for the SPA and Appendix 5 for the

will be lost on either a permanent or construction / decommissioning wever lie within the Order Limits, P23R. SWBGS are areas that are of ring waterbirds in the Solent Region. linked to the Special Protection Area ad Langstone Harbours SPA / Ramsar

Il result in temporary habitat loss to availability of foraging and roosting

nted which require completion and grass ble food resource by October when ter.

sidered for restoration of SWBGS sites:

SWBGS with grass seed before the end re easiest and most cost effective option;

re-seed, turf will be laid and established. llows re-establishment and good sward

primarily dependent on the time eason for implementation. Re-seeding is after May so that for any restoration d be implemented. These measures stablishment and aftercare are provided (APP-505 <u>Rev002Rev004</u>). to re-turfing restoration within the blishment prior to October. P23B will be tog.

red until the month of October. However, e on SWBGS sites in the non-breeding disturbance associated with these will us data gathered by the British Trust for nd Bird Survey (WeBS) Scheme shows g October are approximately 30% of ry.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Additional important factors to consider in require restoration in October and the pre- and the wider network. The October restoration area accounts for
					• 12 % of the P08A SWBGS;
					• 1.2 % of SWBGS core sites; and
					• 0.2 % of the entire SWBGS network.
					On this basis, it is determined that the re October would not impair the SWBGS n impact the non-breeding brent goose po disturbed and therefore the functionality due to the extensive remaining habitat.
					Brent geese will still be able to utilise the itself forms just a small component of the
					This assessment is further supported by temporary, covering at most 17% of a sir a period when the majority of the Solent present. The P08A SWBGS will be restowhen the peak numbers of geese are present.
					Therefore, it is considered that potential resulting from temporary loss of function. Development alone will not result in an a
					Potential effects resulting from the limited temporal and spatial overlap with the Pro APP-424)) are considered to be localised
					The North Portsea Island Coastal Flood Coastline Between Milton Common and (19/01368/FUL) includes a similar comm the non-breeding season (October – Mai brent goose.
					As such, it is considered that there is no integrity from indirect effects, either alone and plans (for full details see Appendix 1 matrices for the SPA and Appendix 5 for
		Accidental spill and Litter	ls Supporting habitat: extent and distribution of	Restore the extent and distribution of suitable habitat (either within or	Unplanned oil or chemical spillages from during construction and decommissionin directly affect prey species within suppor



r include the amount of habitat that will proportion that it is of the SWBGS sites

for:

restoration of 1.7 ha during the month of network and specifically it would not opulation.Brent geese would not be y of the P08A SWBGS would not be lost

ne majority of P08A SWBGS, which in he SWBGS network available.

by the fact that the loss of habitat will be single non-breeding season and during nt brent goose population would not be tored it its entirety for in advance of present in the region.

al indirect effects on supporting habitat onally linked SWBGS from the Proposed adverse effect on site integrity.

ed plans or projects which have Proposed Development (APP-423 and ed and temporary.

d Defence Scheme, Phase 4B d Kendall's Wharf Eastern Road mitment to restore all SWBGS before larch) so will not disturb dark-bellied

o potential for adverse effects on site one or in combination with other project a 1 for the screening and intregrity or the Ramsar site).

m construction activity may occur ing phases. Spills have the potential to orting habitats through a range of

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
			supporting habitat for the non- breeding season	outside the site boundary) which supports the features for all necessary stages of the non- breeding/wintering period (moulting, roosting, loafing, feeding) at: Intertidal Sediment = 831 Ha, Intertidal Seagrass = 77 Ha, Saltmarsh = 40 Ha, Freshwater and Coastal Grazing Marsh = 9 Ha and Coastal Lagoons = Unquantified.	 biological effects. Unplanned disposal of development phases also has the potent ingestion or entanglement. However, roubest practice in terms of waste manager (see Chapter 27: Waste and Material Reensure that these events are prevented adverse effect. Measures detailed in ChaOnshore Outline CEMP (APP-505 Revolumaterials Management Plan ('MMP') and ('SWMP'). The key matters of the SWMF Identify the volume of waste streams to establish the potential for reuse ar Identify opportunities for waste minin Identify the most significant opportunities; Identify suitable waste management not notes; and Consider appropriate site practice segregated and the measures that with the suitable waste management has a stream in the measures that with the measures the measures the measures that with the m
					site operative for waste reduction, red Best practice recommendations for the p outlined in more detail in a detailed CEM undertaken and agreed with relevant aut construction works. Measures detailed in and further captured in the Onshore Outl
					 Designated areas for the storage chemicals.; On-site availability of oil spill clea material and inflatable booms for use
					Use of drip trays under mobile plant;
					Drain socks to trap sediment entering
					Therefore, it is considered that potential from accidental spills and/or litter from the not result in an adverse effect on site interest.



of industrial plastic during all ential to affect prey species through outine mitigation measures of standard ement, pollution prevention measures Resources of the ES APP-142) will dand will therefore not result in an hapter 27 are summarised in the <u>r002)Rev004)</u> and detail incorporating a nd Site Waste Management Plan *M*P are to:

ns likely to be produced during the works and recycling;

to be 'designed out;

imisation and management;

unities to increase re-use and recycling

ent contractors and record appropriate otes and hazardous waste consignment

ces such as how materials will be will be used for raising awareness among reuse and recycling.

prevention of contamination will be MP specific to the works to be uthority prior to commencement of in Chapter 19: Groundwater (APP-134) utline CEMP include:

e of hazardous materials, fuels and

ean-up equipment including absorbent se in the event of an oil spill or leak;

it; and

ng the watercourse.

al effects on supporting habitat resulting the Proposed Development alone will ntegrity.

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					Potential effects resulting from the limiter temporal and spatial overlap with the Pro APP-424) plus the North Portsea Island Phase 4B - Coastline Between Milton Co Road (19/01368/FUL), are considered to Given the requirement to adhere to simil contribute to in combination effects, it is for adverse effects on site integrity from or in combination with other project and and integrity matrices at Appendix 1 for Ramsar site).

Conclusion: Following the application of standard best practice mitigation measures, no 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.



ited plans or projects which have Proposed Development (APP-423 and nd Coastal Flood Defence Scheme, Common and Kendall's Wharf Eastern I to be localised and temporary.

milar best practice measures which could is considered that there is no potential m accidental spills and litter, either alone nd plans (for full details see the screening or the SPA and Appendix 5 for the

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10.6. MARINE: 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 SPA⁴⁷. Table 10.11 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 10.11- 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:

⁴⁷https://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 10.12 below.
- 10.6.3.2. Following the application of standard best practice mitigation measures, no 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 10.12 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 prevent these preventthese 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 prace 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 b management, pollution prevention measu will prevent these events occurring and o that, in consideration of mitigation measu site integrity from the Proposed Developm 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 place
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 prevent these events occurr consideration of mitigation measures, the integrity from the Proposed Development Given the scale and nature of other poter requirement to adhere to similar best prace



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ential plans and projects and the actice measures which could contribute that there will be no adverse effect on lans and projects.

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					to in combination effects, it is predicted th site integrity in combination with other pla
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 during potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occurr consideration of mitigation measures, the integrity from the Proposed Development 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 place
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 during potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occur in consideration of mitigation measures, to integrity from the Proposed Development 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 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 during potential to affect prey species through in However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occur predicted that, in consideration of mitigati effects on site integrity from the Proposed Given the scale and nature of other poter requirement to adhere to similar best predicted



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ential plans and projects and the actice measures which could contribute

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					to in combination effects, it is predicted the site integrity in combination with other plan

Conclusion: Following the application of standard best practice mitigation measures, no 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. MARINE: PAGHAM HARBOUR SPA/RAMSAR SITE

10.7.1. **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 SPA⁴⁸. Table 10.13 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.2- 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;

⁴⁸<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.

10.7.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.7.3.1. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10.14 below.
- 10.7.3.2. Following the application of standard best practice mitigation measures, no 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 10.3 - 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 prevent these events occu- predicted that, in consideration of mitigate adverse effects on site integrity from the Given the scale and nature of other poter 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 throu However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occu in consideration of mitigation measures, site integrity from the Proposed Develop 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 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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10.8. MARINE: LITTORAL SEINO-MARIN SPA

10.8.1. **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 10.15 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 10.4 - 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.

10.8.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.8.3.1. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10.16 below.
- 10.8.3.2. Following the application of standard best practice mitigation measures, no 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 10.5- 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 po- within the water column through a range disposal of industrial or user plastic durin the potential to affect prey species throu However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occu- predicted that, in consideration of mitiga- adverse effects on site integrity from the 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 wit
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 po- within the water column through a range disposal of industrial or user plastic durin the potential to affect prey species throu However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occu- predicted that, in consideration of mitiga- adverse effects on site integrity from the 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 wit
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.	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 throu However, routine mitigation measures of waste management, pollution prevention protocols will prevent these events occur in consideration of mitigation measures, site integrity from the Proposed Develop Given the scale and nature of other pote requirement to adhere to similar best pra-



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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 prevent these events occur predicted that, in consideration of mitigat adverse effects on site integrity from the Given the scale and nature of other poter requirement to adhere to similar best pra contribute to in combination effects, it is p effect on site integrity in combination with

Conclusion: Following the application of standard best practice mitigation measures, no 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.



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10.9. MARINE: ALDERNEY WEST COAST AND BURHOU ISLANDS RAMSAR SITE

10.9.1. **OVERVIEW**

- 10.9.1.1. The Alderney West and Burhou Islands Ramsar site covers some 4.4 nm² 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 10.17 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.6 SACO attributes screened in for assessment

Feature	Impact for which LSE could not be excluded	Equivalent attribute
Gannet Storm petrel Lesser black-backed gull	Accidental spills and Litter	Supporting habitat: water quality - contaminants

- 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.

10.9.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.9.3.1. For those designated features where no LSE could not be concluded, an assessment of potential adverse effects on site integrity is presented in Table 10.18 below.
- 10.9.3.2. Following the application of standard best practice mitigation measures, no 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 10.18 - 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 maphases. Spills have the potential to directly affect protection of biological effects. Unplanned displant development phases also has the potential to affect entanglement. However, routine mitigation measures of standard bornanagement, pollution prevention measures and stratters events occurring and therefore it is predicted to measures, there will be no adverse effects on site in Development alone. Given the scale and nature of other potential plans a adhere to similar best practice measures which coull 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 protection of biological effects. Unplanned displant development phases also has the potential to affect entanglement. However, routine mitigation measures waste management, pollution prevention measures prevent these events occurring and therefore it is primitigation measures, there will be no adverse effects 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 protection of biological effects. Unplanned dispall development phases also has the potential to affect entanglement. However, routine mitigation measures waste management, pollution prevention measures prevent these events ocurring and therefore it is premitigation measures, there will be no adverse effects Development alone. Given the scale and nature of other potential plans a adhere to similar best practice measures which coul it is predicted that there will be no adverse effect on plans and projects.



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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 redicted that, in consideration of cts on site integrity from the Proposed

and projects and the requirement to uld contribute to in combination effects. on site integrity in combination with other

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment

Conclusion: Following the application of standard best practice mitigation measures, no 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. MARINE: 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 SAC⁴⁹.
- 10.10.2.2. Table 10.19 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 10.19 - 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 within the site 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 mixed 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 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 – undesiral



ts ninants	
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 into the AA.
- 10.10.2.4. The assessment for potential adverse effects on integrity for the Solent Maritime SAC (Table 10.20) 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 10.20 below.
- 10.10.3.2. It is concluded that there will be no adverse effect 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
re Th dis qu ha of sp Th fun typ qu ha Th fun ha qu ha sp Th fun ha sp Th fun typ qu ha sp Th sp Th fun typ qu ha sp Th fun typ typ qu ha sp Th fun typ typ qu ha sp Th fun typ typ qu ha sp Th fun typ typ typ typ typ typ typ typ typ typ	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 will be no adverse effects or invasive species. Due to the lack of predicted effects, all practice measures employed for any o concluded that no in combination adve feature as a 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 habitats of qualifying species rely The populations of each of the qualifying species The distribution of	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 fr development phases. However, routin practice in terms of waste manageme 10.2.5) and strict navigational protoco <u>occurringand</u> therefore will not result i Given the scale and nature of other por requirement to adhere to similar best
		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 the integrity in combination with other plan
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically \geq 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) show that, at this between increased SSC / sediment plu disposal of dredge material. For activities in addition to the depositi activities which will lead to increased S the HDD pit(s) (between KP1 and KP1

Table 10.20 - Assessment of potential adverse effects on site integrity for the Solent Maritime SAC across all phases of the Proposed Development



d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure on the integrity of the site as a result of

along with the application of any similar best other plan and project identified, it is verse effects on site integrity will arise on this s.

rom vessels may occur during all ne mitigation measures of standard best ent, polution prevention measures (Section ols will prevent these events occurring and in adverse effects on Site integrity.

potential plans and projects and the practice measures which could contribute to that there will be no adverse effects on site ans and projects.

ment disposal activities to outwith WFD ts of sediment plume dispersion modelling is distance, there will be no connectivity olumes and the SAC resulting from the

ition of dredged material, the worst-case SSC are considered to be the excavation at 91.6), and cable installation (due to the

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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.	potential for the liberation and dispersa and in other isolated locations). Peak SSCs levels of up to 200 mgl ⁻¹ w cable trench or HDD pit) with these con following completion of construction ac transported up to 5 km away from the t will be in the range of 5 to 10 mgl ⁻¹ . So within a few days following completion The finest sediments will be transported however SSCs at these distances will discernible above natural variations in
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Natural variations in SSC ranges from areas, with annual averages of betwee waters.
		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 propose location). SSC variability within the har frequent exposure to storm induced f 2017). Suspended sediments within L
		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 ⁻¹ (Humby and Dunn, 1975 – cir therefore, the peak SSCs resulting from exceed natural levels of variation within In addition, estuarine qualifying feature considered sensitive to this pressure (s are highly tolerant to the levels of incre Development which will only persist for adverse effects on site integrity resultin from increased SSC on estuary feature turbidity, DO, or nutrients are predicted effects on inorganic nitrogen levels are Considering the indiscernible effects p alone, the general lack of sensitivity to activities which may result in in combin in extent and magnitude, it is conclude site integrity from in combination increased site integrity from in combination increased



sal of fines identified between KP 5 and 15,

will be observed locally (i.e. within 2 km of the oncentrations persisting for several hours activities. Sediment plumes will be to be a trench or pit at which point concentrations SSC levels will return to background levels n of these activities.

ted up to 6-10 km in the nearshore area, I be low (< 5 mgl⁻¹) and therefore not n background SSCs.

n approximately <5 to 75 mgl⁻¹ in coastal een 5 – 15 mgl⁻¹ observed within surface

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at its closest possible arbour is high, owing to its tidal nature and luctuations (New Forest District Council, _angstone harbour have been measured at cited in New Forest District Council, 2017), om the Proposed Development would not hin the estuary at Langstone Harbour.

re habitats present within the SAC, are not (see sub-feature assessments below), and reased SSC as a result of the Proposed for a short duration. Therefore, there will be no ting from the Proposed Development alone tres. Negligible effects on the natural levels of ed following cessation of the activity, and no re predicted.

predicted by the Proposed Development o the impact, and the fact that all other ination effects are likely to be similar or lesser led that there will be no adverse effects on eases 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 disposal Deposition from other cable installation between KP1 and KP1.6) will not be sideposited rapidly (i.e. within several hus sediment will be dispersed across a grathroughout the tidal cycle. However, due be liberated into the water column and considered that there will be no discernary resuspended and redistributed under the tidal the tid
		Sediment compositi	Structure: substrate composition and distribution	ure: substrateMaintain the distribution,osition andcomposition andutioncharacter of substrateacross the feature (and	
				each of its subfeatures).	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 alone will be 'light', temporary in nature the Estuary feature, most of the habita level. No discernible effects on normal composition are predicted.
					Considering the indiscernible effects in the Proposed Development alone, and result in in combination effects are like magnitude, it is concluded that there w from in combination deposition of sedin
Atlantic Salt Meadows (<i>Glauco-</i> <i>Puccinellietalia</i>)	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 p followed by all contractors and vessels introduction of INIS introduction as far that there will be no adverse effects on invasive species.
	qualifying natural habitats and habitats of the qualifying			changes in surface condition, soils, nutrient levels or changes to	Due to the lack of predicted effects, alo practice measures employed for any o



ment disposal activities to outwith WFD equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix ice, there will be no sediment deposition within sal activities.

on activities (including excavation of HDD pits significant, with any coarse material mobilised hundred metres of the cable trench). Finer greater spatial extent, transiently depositing due to the low volumes of sediment likely to nd significant dispersion of fine sediment, it is ernible deposition with sediments quickly r 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 resulting from the Proposed Development ure and will not adversely affect the integrity of tats of which are not sensitive to effects at this al sediment and water movement, or sediment

-<u>indiscernibleeffects</u> predicted to result from nd the fact that all other activities which may kely to be similar or lesser in extent and will not be an adverse effect on site integrity diment (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 on the integrity of the site as a result of

along with the application of any similar best other plan and project identified, it is

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	species The structure and function (including typical species) of			hydrology: Spartina anglica, Phragmites australis.	concluded that no in combination adve feature as a result of invasive species.
	qualifying natural habitats The structure and function of the habitats of the qualifying 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.	Mitigation is proposed to restrict sedim 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 S HDD pits, and cable installation (due to
	The supporting processes on which qualifying natural	Increased SSC	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	of fines identified between KP 5 and 18 It is predicted that peak SSCs of up to within 2 km of the cable trench or HDD
	habitats and the habitats of qualifying species rely The populations of	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.	potentially persist for several hours foll 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 The distribution of 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	 The finest sediments will potentially be area, however SSCs at these distance discernible above natural variation. Natural variation ranges from approximannual averages of between 5 – 15 mg The mouth of Langstone harbour (the context of the section of the section
		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.	approximately 1 km from the proposed location), and the closest areas of saltr from the entrance. SSC variability within the harbour is high
		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).



verse effects on site integrity will arise on this s.

ment disposal activities to outwith WFD ts 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. 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 ces will be low (< 5 mgl-1) and therefore not

imately <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 Iltmarsh 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,

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				(offshore / eroding cliffs, etc).	Saltmarsh plants are tolerant of a degr turbidity. It is recognised that turbidity however the plants photosynthesise at that experience reduced photosynthes air and low tides (Tyler Walters, 2004). Therefore, the slight increases in SSC Development alone will not affect the g meadows within the Solent Maritime S predicted. No effect on the natural level cessation of the activity, and negligible ability of this feature to transition or flue
					Considering the indiscernible effects in Proposed Development alone, the gen fact that all other activities which may be similar or lesser in extent and magn adverse effects on site integrity as a re- combination with other plans and proje
		Deposition of sediment (Smothering)	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 (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 sedime 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 saltr from the entrance. Therefore, any dep



gree of increased SSC, and the resulting y reduces the light attenuation through water, at low tide Any species covered by high tide, esis, will be able compensate when exposed to 4).

C predicted to arise from the Proposed e growth or distribution of Atlantic salt SAC and no adverse effects on integrity are vels of turbidity are predicted following ble effects on sediment composition or the luctuate in extent are predicted.

indiscernibleeffects predicted for the eneral lack of sensitivity to the impact, and the result in in combination effects are likely to gnitude, it is concluded that there will be no result of increases in SSC, either alone or in jects.

ment disposal activities to outwith WFD is of sediment plume dispersion modelling istance, 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 l extent, transiently depositing throughout the mes 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

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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.	within the natural variation of the sedir plants are adapted to accreting environ Due to the negligible levels of sedimer any material will beredistributed throug sediment deposition from the Propose
		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	affect the integrity of the site. Considering the indiscernible effects p Development alone, and the fact that combination effects are likely to be sin concluded that there will be no advers deposition of sediment (smothering).
		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.	and water movement, or sediment cor habitat connectivity or their ability to tr
		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 protoco in adverse effects on site integrity as a alone.
				necessary conditions to support the feature.	Given the scale and nature of other por requirement to adhere to similar best in combination effects, it is predicted to 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



diment regime present in the area. Saltmarsh ronments (Tyler-Walters, 2004).

nent predicted to be deposited, and the fact that bugh normal tidal conditions, it is concluded that sed Development alone will not adversely

a predicted to result from the Proposed at all other activities which may result from in similar or lesser in extent and magnitude, it is rse effects on site integrity from in combination . No discernible effects on normal sediment omposition are predicted, and no effects on transition are predicted.

from vessels may occur during all tine mitigation measures of standard best nent, pollution prevention measures (Section cols will ensure that these events will not result s a result from the Proposed Development

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.

d procedures (see section 10.2.5) will be els. This will reduce the potential for ar as is reasonably practicable and will ensure

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	The extent and distribution of qualifying natural habitats and habitats of the qualifying species			species and pathogens, and their impacts.	that there will be no adverse effects or invasive species. Due to the lack of predicted effects, all practice measures employed for any c concluded that no in combination adve arise on this feature as a result of inva
	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 in adverse effects on site integrity as a alone. 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
	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 replenishment of habitats that rely on the sediment supply.	The Natural England Advice on Operation sensitive to increase in SSC or deposition or decommissioning. Therefor adverse effects on the integrity of the of sediment on this sub-feature.	
		Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution	Maintain the presence and spatial distribution of estuary communities.	



on the integrity of the site as a result of

along with the application of any similar best o other plan and project identified, it is verse effects on the integrity of the site will vasive species.

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will ensure that these events will not result a result from the Proposed Development

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.

rations package lists this sub-feature as not sition of sediment at any stage of construction, efore, it is concluded that there is no potential f the site to arise as a result of the deposition

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					•
Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
			of biological 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 ≥ 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) do not affect the integrity of the site and features.	



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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		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.	
		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 qualifying natural habitats and habitats of the qualifying	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 vessel is reasonably practicable and will ens the integrity of the site as a result of in Development alone. Due to the lack of predicted effects, a practice measures employed for any
	species				concluded that no in combination adv arise on this feature as a result of inva
	The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of 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	Unplanned oil or chemical spillages fr development phases. However, routin practice in terms of waste manageme 10.2.5) and strict navigational protoco therefore will not result in adverse effe Development alone. Given the scale and nature of other p requirement to adhere to similar best



nd procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as insure that there will be no adverse effects on invasive species from the Proposed

, along with the application of any similar best by other plan and project identified, it is dverse effects on the integrity of the site will nvasive species.

from vessels may occur during all utine mitigation measures of standard best ment, pollution prevention measures (Section cols will prevent these events occurring and effects on site integrity from the Proposed

potential plans and projects and the st practice measures which could contribute to

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	qualifying species The supporting processes on which qualifying natural			be maintained below the ERL of 1.2 mg per kg.	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	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 (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 ea Marine Cable Corridor. Results of sedin 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.e
		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).	



that there will be no adverse effect on site ans and projects.

ment disposal activities to outwith WFD equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix ice, there will be no sediment deposition with sal activities.

on activities (including excavation of HDD pits icted 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 concluded that majority of sediment is deposited.

nporary nature of the deposition of sediments ost species present in such habitats to survive h light smothering events (Tillin and Ashley, f sediment resulting from the Proposed y affect the integrity of the sub-feature. No

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
					discernible effects on normal sedimen composition are predicted. Considering the indiscernible effects p
					Development alone, the general lack of activities which may result in in combining in extent and magnitude, it is conclude 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 sedin waters (plus a buffer of 3 km). Results (Appendix 6.2 of ES) indicate that, at
		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 pl 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 plum 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 will be low (< 5 mgl ⁻¹) and therefore no Natural variation ranges from approxir 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
			Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.



ent and water movement, or sediment

predicted to result from the Proposed of sensitivity, and the fact that all other bination effects are likely to be similar or lesser ded that there will be no adverse effects on bosition of sediment (smothering) resulting d other project and plans.

iment disposal activities to outwith WFD ts 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 d SSC are considered to be excavation at the 6), 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⁻¹ may be the cable trench or HDD pit) and these sist for several hours following completion of mes are also likely to be transported up to 5 hich point concentrations of 5 to 10 mgl⁻¹ are to background levels within a few days es. The finest sediments will potentially be arshore area, however SSCs at these distances not discernible above natural variation.

kimately <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 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

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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.	mgl ⁻¹ (Portsmouth) (Humby and Dunn, 2017). According to in the Advice on Operation considered sensitive to nutrients or org
			Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. 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 indiscernible effects por general lack of sensitivity to the effect, may result in in combination effects are magnitude, it is concluded that there we from in combination increases in SSC.
Intertidal Mud	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 as far as is reasonably pra- adverse effects on the integrity of the s Due to the lack of predicted effects, all practice measures employed for any of concluded that no in combination adver result of invasive species.
	The structure and function (including typical species) of qualifying natural	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 the between increased SSC / sediment plus disposal of dredge material.
	habitats The structure and				For activities other than the deposition activities which will lead to increased S HDD pit(s) (between KP1 and KP1.6),



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.

predicted by the Proposed Development, the ct, and the fact that all other activities which are likely to be similar or lesser in extent and will be no adverse effects on site integrity C.

d procedures (see section 10.2.5) will be els. This will prevent the introduction of INIS practicable and will ensure that there will be no e site as a result of invasive species.

along with the application of any similar best other plan and project identified, it is verse effects will arise on this feature as a

iment disposal activities to outwith WFD ts 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

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	function of the habitats of the				for the liberation and dispersal of fines in other isolated locations).
	qualifying species The supporting processes on which qualifying natural habitats and the				It is predicted that peak SSCs of up to 2 within 2 km of the cable trench or HDD p potentially persist for several hours follo Sediment plumes are also likely to be tra or pit at which point concentrations of 5 background levels within a few days follo
	habitats of qualifying species rely The populations of				The finest sediments will potentially be t area, however SSCs at these distances discernible above natural variation.
	each of the qualifying species				Natural variation ranges from approxima annual averages of between 5 – 15 mgl
	The distribution of qualifying species within the site				The mouth of Langstone harbour (which within the SAC) is approximately 1 km fit their closest possible location). SSC var its tidal nature and frequent exposure to District Council, 2017). Suspended sedi measured at 200 mgl ⁻¹ , while measured recorded up to 100 mgl ⁻¹ (Portsmouth) (Forest District Council, 2017).
					The qualifying features present within the levels of increased SSC, which will only concluded that there will be no adverse SSC from the Proposed Development a Indiscernible effects on the natural level predicted following cessation of the activ
					Considering the indiscernible effects res alone, the general lack of sensitivity to the activities which may result from in comb lesser in extent and magnitude, it is con on site integrity from in combination incr



s identified between KP 5 and 15, and in

200 mgl⁻¹ may be observed locally (i.e.
D pit) and these concentrations could
llowing completion of construction activities.
transported up to 5 km away from the trench
5 to 10 mgl⁻¹ are predicted. SSC will return to
following completion of these activities.

e transported up to 6-10 km in the nearshore es will be low (< 5 mgl⁻¹) and therefore not

mately <5 to 75 mgl⁻¹ in coastal areas, with ngl⁻¹ observed within surface waters.

ich contains the closest intertidal mud feature in from the proposed HDD entry/exit pits (at variability within the harbour is high, owing to to storm induced fluctuations (New Forest ediments within Langstone harbour have been ed SSC in nearby harbours have been) (Humby and Dunn, 1975 – cited in New

the SAC, are highly tolerant of the predicted hly persist for a short duration. Therefore, it is se effects on site integrity from increased t alone on intertidal mud features. vels of turbidity, DO, TOC, or nutrients are ctivity.

resulting from the Proposed Development of the impact, and the fact that all other mbination effects are likely to be similar or oncluded that there will be no adverse effects increases in SSC.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		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 in adverse effects on site integrity as a 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
		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 (Smothering)	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 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
		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 ti
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	of sediment likely to be liberated into fine sediment, it is considered that o quickly resuspended and redistribut



rom vessels may occur during all ne mitigation measures of standard best ent, pollution prevention measures (Section ols will ensure that these events do notresult a result from the Proposed Development.

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 equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix ice, there will be no sediment deposition with sal activities.

on activities (including excavation of HDD pits icted 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.

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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).	The mouth of Langstone harbour (the or 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) light s that any deposition of sediment resultin will not adversely affect the integrity of normal sediment and water movement
					Considering the indiscernible effects in the Proposed Development alone, the all other activities which may result in i or lesser in extent and magnitude, it is effect on site integrity from in combinat 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),
		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)	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 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 will be low (< 5 mgl ⁻¹) and therefore no



e closest Estuary feature within the SAC, approximately 1 km from the proposed HDD e location), and therefore it is considered that najority of sediment is deposited.

porary nature of the deposition of sediments st species present in such habitats to survive smothering events (Ashley, 2016) ensures ing from the Proposed Development alone of the sub-feature. No material effects on nt, or sediment composition are predicted.

indiscernibleeffects predicted to result from e general lack of sensitivity, and the fact that in combination effects are likely to be similar s concluded that there will be no adverse ation 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 , and cable installation (due to the potential s identified between KP 5 and 15, and in d that peak SSCs of up to 200 mgl⁻¹ may be the 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⁻¹ are to background levels within a few days s. The finest sediments will potentially be shore area, however SSCs at these distances ot discernible above natural variation.

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Increased SSC Increased SSC Increased SSC	Distribution: presence and spatial distribution of biological communities Structure: species composition of component communities Supporting Processes: water quality - turbidity	 do not affect the integrity of the site and features. Maintain the presence and spatial distribution of estuary communities. Restore the Species composition of component communities. Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat. 	Natural variation ranges from approxim annual averages of between 5 – 15 mg 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 nea mgl ⁻¹ (Portsmouth) (Humby and Dunn, 2017). According to in the Advice on Operation considered sensitive to nutrients or org present in these littoral mixed sediment sediment loading, being in the main bu sediments with a high degree of fine se immersion by tides (Ashley, 2016). The SSC, which will only persist for a short are not considered to lead to adverse of natural levels of turbidity, DO, or nutries activity.
					Development, the general lack of sense activities which may result in in combin lesser in extent and magnitude, it is co on site integrity from in combination in
Intertidal sand and muddy sand	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying	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 far as is reasonably practicable and wi on the integrity of the site as a result of Due to the lack of predicted effects, all practice measures employed for any of concluded that in combination impacts integrity.



timately <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 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

s predicted to result from the Proposed insitivity to the effect, and the fact that all other pination effects are predicted to be similar or concluded that there will be no adverse effects increases in SSC.

d procedures (see section 10.2.5) will be els. This will prevent the introduction of INIS as will ensure that there will be no adverse effects of invasive species.

along with the application of any similar best other plan and project identified, it is ts will not result in an adverse effect on site

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	species 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 from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocols <u>occurringand</u> therefore will not result in of the Proposed Development alone. 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
	The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The populations of each of the qualifying species The distribution of qualifying species within the site	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 the replenishment of habitats that rely on the sediment supply.	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km); which even 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 di transiently depositing throughout the tie 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 within which mudflat features exist) is a
		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 ols will prevent these events occurring and in adverse effects on site integrity as a result

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.

ment disposal activities to outwith WFD equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix ice, there will be no sediment deposition with sal activities.

on activities (including excavation of HDD pits icted 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

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Sediment composition and compositin and composition and composition and composition and compos	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 ma The highly limited magnitude and temp predicted, along with the ability of mos or recover quickly from light smothering ensures that any deposition of sediment alone will not adversely affect the integ normal sediment pathways are predicted.	
					Considering indiscernible effects indisc Proposed Development, the general la activities which may result in in combin in extent and magnitude, it is conclude site integrity from in combination depos
		Increased SSC	Supporting Processes: water quality - DO	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) do not affect the integrity of the site and features.	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 t or pit at which point concentrations of S to return to background levels within a activities.



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 ing events (Tyler-Walters and Marshall, 2006) nent resulting from the Proposed Development egrity of the sub-feature. No effects on the cted, and no materialchanges to sediment ed.

<u>scernibleeffects</u> predicted to result from the lack of sensitivity, and the fact that all other pination effects are likely to be similar or lesser ded that there will be no adverse effects on position of sediment (smothering).

ment disposal activities to outwith WFD ts 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

to 200 mgl⁻¹ 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 f 5 to 10 mgl⁻¹ are predicted. SSC is expected a few days following completion of these

WSP/Natural Power

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 estuary communities.	The finest sediments will potentially be area, however SSCs at these distance discernible above natural variation. 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 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	Supporting Processes: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	2017). Suspended sediments within La 200 mgl ⁻¹ , while measured SSC in nea mgl ⁻¹ (Portsmouth) (Humby and Dunn 2017). According to in the Advice on Operation considered sensitive to nutrients. Furth mixed sediments are typically highly to
		Increased SSC	Structure: sediment TOC content	Maintain TOC content in the sediment at existing levels.	in the main burrowing species with a p of fine sediments which are mobilised and Marshall, 2006). Therefore, the pr from the Proposed Development alone before returning to normal levels are n site integrity. No effect on the natural I cessation of the activity, and discernib sediments or inorganic nitrogen levels
					Considering the indiscernible effects in the Proposed Development alone, the the fact that all other activities which m to be similar or lesser in extent and ma potential for adverse effects on site int
Intertidal seagrass beds	Maintaining or restoring: The extent and	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 is reasonably practicable and will ensu- integrity of the site as a result of invasi



be transported up to 6-10 km in the nearshore ces will be low (< 5 mgl⁻¹) and therefore not

imately <5 to 75 mgl⁻¹ in coastal areas, with ngl⁻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 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 preference for sediments with a high degree d readily on immersion by tides (Tyler-walters predicted levels of increased SSC resulting ne, which will only persist for a short duration not considered to lead to adverse effects on I level of turbidity is predicted following ible changes to the organic content of the Is are predicted.

-<u>indiscernibleeffects</u> predicted as a result of e general lack of sensitivity to the effect, and may result in in combination effects are likely nagnitude, it is concluded that there is no ntegrity from in combination increases in SSC.

d procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as sure that there will be no adverse effect on the sive species.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	distribution of qualifying natural habitats and habitats of the qualifying				Due to the lack of predicted effects, all practice measures employed for any o considered that no in combination adve arise on this feature as a result of inva
	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. Reduce aqueous contaminants to levels	Unplanned oil or chemical spillages from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocol in adverse effects on site 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 plant
	qualifying natural habitats and the habitats of qualifying species rely The populations of		contaminants	equating to High / Good Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
	each of the qualifying species	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
The distribution of 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 sedi 6.2 of ES) indicate that, at this distance the SAC resulting from dredge dispose	
		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 on the integrity of the site will vasive species.

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section ols will ensure that these events will not result

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,

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	transiently depositing throughout the till of sediment likely to be liberated into the fine sediment, it is considered that dep quickly resuspended and redistributed
				across the feature (and each of its subfeatures).	The mouth of Langstone harbour (the containing this sub-feature) is approxinentry/exit pits (at their closest possible it will be outwith the area where the matrix
					Therefore, any deposition of sediment alone will be 'light', temporary in nature the sub-feature, which due to its prese accretion will be tolerant of the very low
					Considering the very small and localise Proposed Development alone, and the in in combination effects are likely to b is concluded that there will be no adve 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.	
		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 or pit at which point concentrations of s to return to background levels within a activities.



tidal cycle. However, due to the low volumes the water column and significant dispersion of eposition will be indiscernible 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.

nt resulting from the Proposed Development are and will not adversely affect the integrity of sence within an area of natural sediment ow levels of deposition predicted.

sed effects predicted to result from the ne fact that all other activities which may result be similar or lesser in extent and magnitude, it rerse effects on site integrity from in sediment (smothering).

ment disposal activities to outwith WFD is of sediment plume dispersion modelling this distance, there will be no connectivity plumes 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

o 200 mgl⁻¹ may be observed locally (i.e. D pit) and these concentrations could ollowing completion of construction activities. e transported up to 5 km away from the trench f 5 to 10 mgl⁻¹ are predicted. SSC is expected a few days following completion of these

WSP/Natural Power

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 SSCs at these distance discernible above natural variation. 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 of 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 such short term isolated events as word Proposed Development (D'Avack, et a over a kilometre from the mouth of the very high levels of SSC with received I levels, and lower than peak levels exper are also able to photosynthesise during seagrass bed function or distribution a result of the Proposed Development. In Operations for this SAC, this sub feature deoxygenation. Therefore, the predicted Proposed Development alone, which w returning to normal levels are not cons- integrity. No discernible effect on the m cessation of the activity, and no effects p
					Development alone, the general lack of other activities which may result in in o lesser in extent and magnitude, it is co on site integrity from in combination in



be transported up to 6-10 km in the nearshore ces will be low (< 5 mgl⁻¹) and therefore not

imately <5 to 75 mgl⁻¹ in coastal areas, with ngl⁻¹ 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 frequent exposure to storm induced ncil, 2017). Suspended sediments within ured at 200 mgl⁻¹, while measured SSC in d up to 100 mgl⁻¹ (Portsmouth) (Humby and strict Council, 2017).

to very high or long term increases in SSC and reduced oxygen levels), are tolerant to ould be experienced as a result of the al., 2019a). Seagrass beds are also located he harbour and as such will not be affected by l levels likely well within normal background perienced in this environment. Littoral beds ing periods of exposure. No changes to littoral are therefore considered likely to arise as a In addition, according to in the Advice on ture is not considered sensitive to ted levels of increased SSC resulting from the will only persist for a short duration before nsidered to lead to adverse effects on site natural level of turbidity is predicted following cts in inorganic nitrogen levels are predicted.

predicted as a result of the Proposed of sensitivity to the effect, and the fact that all combination effects are likely to be similar or concluded that there will be no adverse effects increases in SSC.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
Salicornia and other annuals colonising mud and sand	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species	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 p followed by all contractors and vessels is reasonably practicable and will ensu the integrity of the site as a result of inv Development alone. Due to the lack of predicted effects, alo practice measures employed for any of concluded that no in combination adve arise on this feature as a result of invas
	 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 The distribution of 	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 sediments (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this distincreased SSC and the SAC. For activities other than the deposition activities which will lead to increased SHDD pits, and cable installation (due to of fines identified between KP 5 and 19 lit 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 SSCs at these distances discernible above natural variation. Natural variation ranges from approximannual averages of between 5 – 15 mg. The mouth of Langstone harbour (the approximately 1 km from the proposed)
		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 other habitats seaward and landward.	
		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 for colonisation each year of the annual species that comprise the habitat.	



d procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as sure that there will be no adverse effects on invasive species from the Proposed

along with the application of any similar best other plan and project identified, it is verse effects on the integrity of the site will vasive species.

ment disposal activities to outwith WFD ts of sediment plume dispersion modelling listance, 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 ollowing completion of construction activities. e transported up to 5 km away from the trench f 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 ces will be low (< 5 mgl-1) and therefore not

imately <5 to 75 mgl-1 in coastal areas, with ngl-1 observed within surface waters.

e closest Estuary feature within the SAC) is ed HDD entry/exit pits (at their closest possible

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	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: <i>Aster tripolium</i> , <i>Puccinellia maritima</i> , Salicornia species, <i>Sueada maritima</i> and <i>Atriplex portulacoides</i> . SM27 also includes Sagina	location). SSC variability within the had 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 (excav affected by high levels of SSC with red background levels. Saltmarsh plants are tolerant of a degr turbidity. It is recognised that turbidity
		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.	however salt marsh vegetation is imm able to photosynthesize. Therefore, sl from the Proposed Development will r Salicornia and other annuals colonisir
		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).	SAC. No effects on normal sediment a composition are predicted, and no effect transition are predicted. Therefore, it is effects on site integrity from increased Considering the indiscernible effects in the Proposed Development, the gener fact that all other activities which may be similar or lesser in extent and mage 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
		Deposition of sediment	Supporting Processes: tidal Processes	Maintain the degree of tidal immersion and emersion and tidal flows	rapidly (i.e. within several hundred me be dispersed across a greater spatial e tidal cycle. However, due to the volum water column and significant dispersio



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 nn, 1975 – cited in New Forest District Council,

support this feature are located over 2 km avation of HDD pits), and as such will not be eceived levels being within beingwithin 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 not affect the growth or distribution of ing mud and sand within the Solent Maritime and water movement, or sediment fects on habitat connectivity or their ability to is concluded that there will be no adverse ed SSC on this feature.

-<u>indiscernibleeffects</u> predicted as a result of eral lack of sensitivity to the impact, and the y result in in combination effects are likely to gnitude, it is concluded that there will be no in combination increases in SSC.

ment disposal activities to outwith WFD ts of sediment plume dispersion modelling listance, there will be no connectivity for

on activities (including excavation of HDD pits) any coarse material mobilised deposited tetres 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, deposition will be

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
				that supports the function of the habitat type.	negligible with sediments quickly resu of tidal flows. The mouth of Langstone harbour (the
		Deposition of Sediment (Smothering)	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 other habitats seaward and landward.	approximately 1 km from the proposed location), and the closest area of estu- over 2 km from the HDD pits. Therefor majority of sediment is deposited. The light, and likely within the natural varia area. Saltmarsh plants, particularly pic
		Deposition of Sediment (Smothering)	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	environments and may not be adverse month (Tyler-Walters, 2001). Therefor predicted to be deposited, and the fac through normal tidal conditions, it is co
		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.	of the Proposed Development will not Considering the indiscernible effects in the Proposed Development, and the fa in combination effects are predicted to
		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: Aster tripolium, Puccinellia maritima, Salicornia species, Sueada maritima and Atriplex portulacoides. SM27 also includes Sagina	magnitude, it is concluded that there v from in combination effects of depositi
		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.	



uspended and redistributed under the forcing

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 fore, it will be outwith the area where the erefore, any deposition of sediment will be iation of the sediment regime present in the bioneer species, are adapted to accreting sely affected by smothering events for up to a ore, due to the negligible levels of sediment act that any material will be redistributed concluded that sediment deposition as a result of adversely affect the integrity of the feature.

-<u>indiscernibleeffects</u> predicted as a result of fact that all other activities which may result in to be similar or lesser in extent and will be no adverse effects on site integrity ition of sediment (smothering).

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		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 necessary conditions to support the feature.	Unplanned oil or chemical spillages from development phases. However, routing practice in terms of waste management 10.2.5) and strict navigational protocol <u>occurringand</u> therefore will not result in of the Proposed Development alone. Given the scale and nature of other por requirement to adhere to similar best point in combination effects, it is predicted the integrity from in combination effects with
Spartina swards (Spartinion maritimae)	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying species The structure and	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 is reasonably practicable and will ensu- integrity of the site as a result of invasi Due to the lack of predicted effects, all practice measures employed for any of concluded that no in combination adve- arise on this feature as a result of invasi
	function (including typical species) of qualifying natural habitats The structure and function of the habitats of the	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 /sediment plumes with For activities other than the deposition activities which will lead to increased S



from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will prevent these events occurring and t in adverse effects on site integrity as a result

botential plans and projects and the t practice measures which could contribute to that there will be no adverse effect on site with other plans and projects.

d procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as sure that there will be no adverse effect on the sive species.

along with the application of any similar best o other plan and project identified, it is verse effects on the integrity of the site will vasive species.

iment disposal activities to outwith WFD ts of sediment plume dispersion modelling listance, there will be no connectivity for thin the SAC.

on of dredged material, the worst-case I SSC are considered to be excavation at the

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	qualifying species The supporting processes on which qualifying natural	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.	HDD pits, and cable installation (due to of fines identified between KP 5 and 15 It is predicted that peak SSCs of up to 2 within 2 km of the cable trench or HDD
	habitats and the 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.	potentially persist for several hours follo Sediment plumes are also likely to be t or pit at which point concentrations of 5 to return to background levels within a
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.	activities. The finest sediments will potentially be area, however SSCs at these distances discernible above natural variation. Natural variation ranges from approxim
	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: <i>Spartina</i> <i>maritima</i> , <i>S. alterniflora</i> , <i>S. townsendii</i> , <i>Arthrocnemum perenne</i> , <i>Puccinellia maritima</i> , Salicornia species, <i>Sueada maritima</i>	 annual averages of between 5 – 15 mg The mouth of Langstone harbour (the or approximately 1 km from the proposed location). SSC variability within the hard frequent exposure to storm induced flue 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 surfrom the closest marine activity (excavar affected by high levels of SSC with recomposition).
		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.	levels. Saltmarsh plants are tolerant of a degree turbidity. It is recognised that turbidity is however salt marsh vegetation is immer able to photosynthesize. Therefore, slig from the Proposed Development alone distribution of Spartina swards within the natural levels of turbidity are predicted effects on water quality or availability, so feature to transition or fluctuate in exter



to the potential for the liberation and dispersal 15, and in other isolated locations).

o 200 mgl-1 may be observed locally (i.e. D pit) and these concentrations could ollowing completion of construction activities. e transported up to 5 km away from the trench f 5 to 10 mgl-1 are predicted. SSC is expected a few days following completion of these

e transported up to 6-10 km in the nearshore es will be low (< 5 mgl-1) and therefore not

mately <5 to 75 mgl-1 in coastal areas, with ngl-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 luctuations (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,

support this feature are located over 2 km vation of HDD pits), and as such will not be eceived levels likely within normal background

gree of increased SSC, and the resulting y reduces the light attenuation through water, hersed for the majority of the tidal cycle and light increases in SSC as predicted to arise he will not adversely affect the growth or the Solent Maritime SAC. No effect on the d following cessation of the activity, and no , sediment composition, or the ability of this tent are predicted. Therefore, it is concluded

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
					that there will be no adverse effects on feature.
					Considering the indiscernible effects in the Proposed Development alone, the the fact that all other activities which m to be similar or lesser in extent and ma adverse effects on site integrity from in
		Deposition of sediment	Supporting Processes: sedimentary Processes	Maintain the sedimentary processes (suspended sediment, sediment transfer, etc)	Mitigation is proposed to restrict sedim waters (plus a buffer of 3 km). Results (Appendix 6.2) indicate that, at this dist sediment deposition with the SAC.
				that sustain the elevation and topography of the marsh surface.	Therefore, any deposition of sediment variation of the sediment regime prese to accreting environments and will not
		Deposition of sediment	Supporting Processes: tidal Processes	Maintain the degree of tidal immersion and emersion that supports the function of the habitat type.	for up to a month (Tyler-Walters, 2001) Deposition from other cable installation is not predicted to be significant with an rapidly (i.e. within several hundred met be dispersed across a greater spatial e
		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.	tidal cycle. However, due to the volume water column and significant dispersion deposition will be indiscernible with sec redistributed under the forcing of tidal f
		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.	The mouth of Langstone harbour (the capproximately 1 km from the proposed location), and the closest area of estua swards is over 2 km from the HDD pits
		Deposition of Sediment (Smothering)	Extent of the feature within the site	Restore the total extent of saltmarsh features to at least 1,095 hectares.	outwith the area where the majority of s effects on the integrity of the site will ar from deposition of sediment on <i>Spartin</i> Considering the very small and localise
		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	Proposed Development alone, and the in in combination effects are likely to be is concluded that there will be no adver



n site integrity from increased SSC on this

ndiscernibleeffects predicted as a result of e general lack of sensitivity to the impact, and may result in in combination effects are likely agnitude, it is concluded that there will be no in combination increases in SSC.

ment disposal activities to outwith WFD s of sediment plume dispersion modelling stance, there will be no connectivity for

t will be light, and likely within the natural ent in the area. Saltmarsh plants are adapted t be adversely affected by smothering events 1).

on activities (including excavation of HDD pits) any coarse material mobilised deposited etres of the cable trench). Finer sediment will extent, transiently depositing throughout the nes of sediment likely to be liberated into the on of fine sediment, it is considered that ediments quickly resuspended and flows.

a closest Estuary feature within the SAC) is d HDD entry/exit pits (at their closest possible parine habitat that could support Spartina is. Therefore, it is concluded that it will be f sediment is deposited and no adverse arise from the Proposed Development alone *ina* swards.

sed effects predicted as a result of the e fact that all other activities which may result be similar or lesser in extent and magnitude, it erse effects on site integrity from in

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		Deposition of Sediment (Smothering)	Structure and function (including its typical species): key structural, influential and distinctive species	suitability of surrounding areas for colonisation. 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,	combination deposition of sediment (s sediment and water movement, or sec effects on habitat connectivity, emersion predicted.
		Pollution	Supporting Processes: water quality	Sueada maritima 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, routing practice in terms of waste management 10.2.5) and strict navigational protocol and therefore will not result in adverse 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 The structure and	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 as is reasonably practicable and will e the integrity of the site as a result of in Due to the lack of predicted effects, all practice measures employed for any of concluded that no in combination adve arise on this feature as a result of inva
		Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations	Unplanned oil or chemical spillages fro development phases. However, routin practice in terms of waste management



(smothering). No discernible effects on normal ediment composition are predicted, and no sion regimes, or their ability to transition are

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section cols will ensure that these events fo not occur se effects on site integrity.

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.

nd procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far I ensure that there will be no adverse effect on i invasive species.

along with the application of any similar best o other plan and project identified, it is verse effects on the integrity of the site will vasive species.

from vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	function (including typical species) of qualifying natural habitats			where they are not adversely impacting the infauna of the sub- feature.	10.2.5) and strict navigational protocols and therefore will not result in adverse Given the scale and nature of other po requirement to adhere to similar best p
	The structure and function of the habitats of the qualifying species The supporting processes on which qualifying natural	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 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 	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 estuary communities.	sediments quickly resuspended and re
		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	



ols will ensure that these events do not occur se effects on Site integrity.

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.

ment 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 tetres 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' and temporary in nature. The nvironment with a relatively high natural level is not sensitive to effects at the predicted erse effect on site integrity arising from in the Proposed Development alone on subtidal

predicted as a result of the Proposed t all other activities which may result in in imilar or lesser in extent and magnitude, it is trse effects on site integrity from effects from in (smothering).

WSP/Natural Power

	Conservation Objective	Effect	Attribute	Target	Assessment
				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 ≥ 5.7 mg L-1 (at 35 salinity) for 95 % of year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedin 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 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 SSCs at these distance discernible above natural variation. 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 Coarse sediment habitats have a low s present are naturally found within high mobility is common (McQuillan and Til composition or distribution are predicte on Operations package lists this sub-fe stage of construction, operation or dec expected to be outwith normal levels a temporary and short term, returning to
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	



ment disposal activities to outwith WFD ts of sediment plume dispersion modelling listance, 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 ollowing completion of construction activities. 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 ces will be low (< 5 mgl-1) and therefore not

imately <5 to 75 mgl⁻¹ in coastal areas, with ngl⁻¹ observed within surface waters.

y sensitivity to increases in SSC as the species gh energy environments were sediment Fillin, 2006), as such no effects on species cted. Furthermore, the Natural England Advice -feature as not sensitive to nutrients at any ecommissioning. Changes DO are not and any effects to this attribute would be to background on cessation of the activity. No

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		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.	effects on inorganic nitrogen levels are discreet events predicted which will be experienced, it is concluded that there from increased SSC on this sub feature Considering the very small and localise Proposed Development, the lack of set other activities which may result in in c lesser in extent and magnitude, it is co on site integrity from in combination inc
Subtidal mixed sediments	 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 	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 is reasonably practicable and will ensu the integrity of the site as a result of inv Due to the lack of predicted effects, all practice measures employed for any of concluded that no in combination adve on this feature as a result of invasive s
		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, routine practice in terms of waste management 10.2.5) and strict navigational protocols occurand therefore will not result in add 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
		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.	



re predicted. Therefore, considering the be similar to natural variation already re will be no adverse effects on site integrity ure.

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 concluded that there will be no adverse effects increases in SSC.

I procedures (see section 10.2.5) will be ls. This will prevent INIS introduction as far as sure that there will be no adverse effects on nvasive species.

along with the application of any similar best other plan and project identified, it is verse effect on the integrity of the site will arise species.

rom vessels may occur during all ne mitigation measures of standard best ent, pollution prevention measures (Section ols will ensure that these events do not dverse effects on Site integrity.

potential plans and projects and the practice measures which could contribute to that there will be no adverse effect on site ans and projects.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	 qualifying natural habitats and the habitats of qualifying species rely The populations of each of the qualifying species The distribution of qualifying species 	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 sedime waters (plus a buffer of 3 km). Results of (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 metric comparable habitat types). Finer sedimes spatial extent, transiently depositing the volumes of sediment likely to be liberated dispersion of fine sediment, it is considered
	within the site	Deposition of Sediment (Smothering)	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	with sediments quickly resuspended an flows. Therefore, any deposition of sediment v feature is present in environments with
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	movement, and as such is not sensitive there will be no adverse effect on site in Development alone from deposition of features. Considering the indiscernible effects pr
	Sediment compos	Structure: substrate composition and distribution	Maintain the distribution, composition and character of substrate across the feature (and each of its subfeatures).	Development alone, and the fact that a combination effects are likely to be sim concluded that there will be no adverse effects of deposition of sediment (smoth	
		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 % of the year), avoiding deterioration from existing levels.	Mitigation is proposed to restrict sedime waters (plus a buffer of 3 km). Results of (Appendix 6.2) indicate that, at this dista- increased SSC with the SAC. For activities other than the deposition of activities which will lead to increased SS 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 ment will be dispersed across a greater hroughout the tidal cycle. However, due to the ated into the water column and significant dered that deposition will be indiscernible and redistributed under the forcing of tidal

t will be 'light' and temporary in nature. The h a relatively high natural level of sediment ve to effects at the predicted level. Therefore integrity arising from the Proposed f sediment on subtidal course sediment

oredicted as a result of the Proposed all other activities which may result in in milar or lesser in extent and magnitude, it is se effects on site integrity from in combination othering).

ment disposal activities to outwith WFD s of sediment plume dispersion modelling stance, there will be no connectivity from

n 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).

WSP/Natural Power

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 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. The finest sediments will potentially be area, however SSCs at these distance discernible above natural variation.
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Natural variation ranges from approxim annual averages of between 5 – 15 mg Mixed sediment habitats have a low se present are naturally found within high mobility is common (Readman, 2016),
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	composition or distribution are predicted Furthermore, the Natural England Adv feature as not sensitive to nutrients at decommissioning. Changes DO are no
	Increas	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.	any effects to this attribute would be to background on cessation of the activit predicted. Therefore, considering the o similar to natural variation already exp adverse effect on site integrity from ino Considering the indiscernible effects in the Proposed Development, the lack of all other activities which may result in or lesser in extent and magnitude, it is effect on site integrity from in combina
Subtidal sand	Maintaining or restoring: The extent and	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 is reasonably practicable and will ensu- the integrity of the site as a result of inv



to 200 mgl⁻¹ 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⁻¹ are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore ces will be low (< 5 mgl-1) and therefore not

imately <5 to 75 mgl⁻¹ in coastal areas, with ngl⁻¹ observed within surface waters.

sensitivity to increases in SSC as the species h energy environments where sediment), as such no significant effects on species ted.

dvice on Operations package lists this subat any stage of construction, operation or not 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 concluded that there will be no ncreased SSC on this sub feature.

-<u>indiscernibleeffects</u> predicted as a result of of sensitivity to the impact, and the fact that n in combination effects are likely to be similar is concluded that there will be no adverse nation effects from increases in SSC.

d procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as sure that there will be no adverse effects on invasive species.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	distribution of qualifying natural habitats and habitats of the qualifying				Due to the lack of predicted effects, alc practice measures employed for any of concluded that no in combination adve arise on this feature as a result of invas
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 sub- feature.	Unplanned oil or chemical spillages fro development phases. However, routine practice in terms of waste managemen 10.2.5) and strict navigational protocols <u>occurringand</u> therefore will not result in Given the scale and nature of other pot requirement to adhere to similar best p	
	The structure and function of the habitats of the qualifying species The supporting processes on which qualifying natural	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 and the habitats of qualifying species rely The populations of each of the qualifying species The distribution of qualifying species within the site 	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 sedime 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 sedime 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 nature



along with the application of any similar best other plan and project identified, it is verse effects on the integrity of the site will vasive species.

rom vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section ols will prevent these events occurring and in an adverse effect on site integrity.

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.

ment 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 tetres 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

WSP/Natural Power

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 sediment and water movement, or sed Considering the indiscernible effects in the Proposed Development, and the fa
		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).	in combination effects are likely to be s 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 15
		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 to or pit at which point concentrations of to to return to background levels within a activities. The finest sediments will potentially be area, however SSCs at these distance discernible above natural variation. Natural variation ranges from approxim
			Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.



evel. No discernible effects on normal ediment composition are predicted.

-<u>indiscernibleeffects</u> predicted as a result of fact that all other activities which may result in e similar or lesser in extent and magnitude, it is erse effects on site integrity from in sediment (smothering).

ment disposal activities to outwith WFD ts 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⁻¹ 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⁻¹ are predicted. SSC is expected a few days following completion of these

be transported up to 6-10 km in the nearshore ces will be low (< 5 mgl-1) and therefore not

imately <5 to 75 mgl⁻¹ in coastal areas, with ngl⁻¹ observed within surface waters.

nsitivity to increases in SSC as the species th energy environments were sediment

WSP/Natural Power

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 (Tillin, 2016), as su 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	decommissioning. Changes DO are not any effects to this attribute would be te background on cessation of the activity predicted. Therefore, considering the of similar to natural variation already exp adverse effects on site integrity from in
			m. m	material) across the habitat.	Considering the indiscernible effects p Development, the lack of sensitivity to activities which may result in in combin in extent and magnitude, it is conclude integrity from in combination increases
Subtidal seagrass beds	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	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 is reasonably practicable and will ensu integrity of the site as a result of invasi
					Due to the lack of predicted effects, all practice measures employed for any o concluded that no in combination adve arise on this feature as a result of inva
		Pollution	Supporting Processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the sub-	Unplanned oil or chemical spillages from development phases. However, routine practice in terms of waste management 10.2.5) and strict navigational protocol <u>ocuccirng</u> and therefore will not result in Circon the peak and patters of other pe
				feature.	Given the scale and nature of other po requirement to adhere to similar best p
	The structure and function of the habitats 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	in combination effects, it is predicted the integrity in combination with other plan



such no effects on species composition or

dvice on Operations package lists this subat any stage of construction, operation or not 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 concluded that there will be no increased SSC on this sub feature.

predicted as a result of the Proposed to the impact, and the fact that all other pination effects are likely to be similar or lesser ded that there will be no adverse effect on site es in SSC.

d procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as sure that there will be no adverse effect on the sive species.

along with the application of any similar best other plan and project identified, it is verse effects on the integrity of the site will vasive species.

rom vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section ols will prevent these events occurring It in adverse effects on Site integrity.

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.

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	The supporting processes on which qualifying natural			WFD), avoiding deterioration from existing levels.	
	habitats and the habitats of qualifying species rely	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
	The populations of each of the qualifying species	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
	The distribution of qualifying species within the site	Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component 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 ti of sediment likely to be liberated into th
		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).	fine sediment, it is considered that dep quickly resuspended and redistributed The mouth of Langstone harbour (the containing this sub-feature) is approxin entry/exit pits (at their closest possible it will be outwith the area where the ma
					Therefore, any deposition of sediment alone will be 'light', temporary in nature the sub-feature, which due to its prese accretion will be tolerant of the very low
				Considering the indiscernible effects p Development alone, and the fact that a combination effects are likely to be sim concluded that there will be no adverse effects of deposition of sediment (smo	
		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	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.



ment disposal activities to outwith WFD equates to disposal seaward of KP21 of the diment plume dispersion modelling (Appendix ice, there will be no sediment deposition with sal activities.

on activities (including excavation of HDD pits icted 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 kimately 1 km from the proposed HDD le location), and therefore it is considered that majority of sediment is deposited.

nt resulting from the Proposed Development ure and will not adversely affect the integrity of sence within an area of natural sediment ow levels of deposition predicted.

predicted to result from the Proposed t all other activities which may result from in imilar or lesser in extent and magnitude, it is rse effects on site integrity from in combination othering).

iment disposal activities to outwith WFD ts of sediment plume dispersion modelling t this distance, there will be no connectivity plumes and the SAC resulting from the

WSP/Natural Power

Feature/Sub- features	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 pit(s) (between KP1 and KP1.6), for the liberation and dispersal of fines other isolated locations).
		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. The finest sediments will potentially be area, however SSCs at these distance discernible above natural variation.
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.	Natural variation ranges from approxim annual averages of between 5 – 15 mg The mouth of Langstone harbour (the which this sub-feature is present) is ap
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	entry/exit pits (at their closest possible is high, owing to its tidal nature and fre fluctuations (New Forest District Coun Langstone harbour have been measur nearby harbours have been recorded
		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.	Dunn, 1975 – cited in New Forest Distri- Seagrass beds, although not tolerant to (due to a reduction in photosynthesis as such short term isolated events as word Proposed Development (D'Avack, et al over a kilometre from the mouth of the affected by very high levels of SSC with background levels, and lower than pea- Littoral beds are also able to photosynta adverse changes to littoral seagrass be considered likely to arise as a result of



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⁻¹ 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 f 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 ces will be low (< 5 mgl⁻¹) and therefore not

imately <5 to 75 mgl⁻¹ in coastal areas, with ngl⁻¹ 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⁻¹, while measured SSC in d up to 100 mgl⁻¹ (Portsmouth) (Humby and strict Council, 2017).

t to very high or long term increases in SSC and reduced oxygen levels), are tolerant to ould be experienced as a result of the al., 2019). Seagrass beds are also located he harbour and as such are unlikely to be with received levels well within normal eak levels experienced in this environment. withesise during periods of exposure. No bed function or distribution are therefore of the Proposed Development. In addition,

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
					according to in the Advice on Operation considered sensitive to deoxygenation predicted following cessation of the ac- levels are predicted. Therefore, the pre- only persist for a short duration before considered to lead to adverse effects of Considering the indicernible effects pre- Development, the general lack of sens- other activities which may result in in of lesser in extent and magnitude, it is co- on site integrity from in combination effects
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 The structure and function (including typical species) of qualifying natural habitats The structure and function of the 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 is reasonably practicable and will ensu- the integrity of the site as a result of in Due to the lack of predicted effects, allo practice measures employed for any of concluded that no in combination adve- arise on this feature as a result of inva-
		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 therefore will not result in adverse effect 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
		Pollution	Supporting Processes: water quality - contaminants	Reduce aqueous contaminants to levels equating to High / Good	



ions for this SAC, this sub feature is not on. No effect on the natural level of turbidity is activity, and no effects in inorganic nitrogen redicted levels of increased SSC, which will e returning to normal levels are not on site integrity.

redicted as a result of the Proposed asitivity to the impact, and the fact that all combination effects are likely to be similar or concluded that there will be no adverse effects effects of increases in SSC.

d procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as sure that there will be no adverse effects on invasive species.

along with the application of any similar best other plan and project identified, it is verse effects on the integrity of the site will vasive species.

rom vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section ols will prevent these events occurring and fects on Site integrity.

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.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	habitats and the habitats of qualifying species rely The populations of			Status according to Annex VIII and X of the WFD, avoiding deterioration from existing levels.	
	each of the qualifying 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 replenishment of the feature, and / or replenishment of habitats that rely on the sediment supply from the feature.	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 libera dispersion of fine sediment, it is conside sediments quickly resuspended and rest Therefore, any deposition of sediment alone will be 'light', temporary in nature the feature which is not sensitive to effect Considering the indiscernible effects in the Proposed Development alone, and result in in combination effects are like magnitude, it is concluded that there w from any in combination effects of dep
		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



iment disposal activities to outwith WFD Its of sediment plume dispersion modelling t this distance, there will be no connectivity for

tion activities (including excavation of HDD pits) in any coarse material mobilised deposited netres of the cable trench and within diment will be dispersed across a greater throughout the tidal cycle. However, due to the erated into the water column and significant sidered that deposition will be negligible with redistributed under the forcing of tidal flows.

ent resulting from the Proposed Development ure and will not adversely affect the integrity of effects at this level.

<u>indiscernibleeffects</u> predicted as a result of nd the fact that all other activities which may kely to be similar or lesser in extent and will be no adverse effects on site integrity leposition of sediment (smothering).

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).

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
		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.	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. The finest sediments will potentially be
		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.	 area, however SSCs at these distance discernible above natural variation. Natural variation ranges from approxin annual averages of between 5 – 15 mg Mudflat and sandflat habitats are not s in SSC. Therefore, considering the dis to natural variation already experience effects on site integrity from increased no adverse effects on faunal communi
		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.	effect on the natural level of turbidity o activity, and no effects on inorganic nit Considering the indiscernible effects in the Proposed Development, the lack o all other activities which may result in i or lesser in extent and magnitude, it is effects on site integrity from in combina
		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.	



to 200 mgl-1 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 f 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 ces will be low (< 5 mgl-1) and therefore not

imately <5 to 75 mgl-1 in coastal areas, with ngl-1 observed within surface waters.

sensitive or have low sensitivity to increases liscreet events predicted which will be similar ced, it is considered that there will be no ed SSC on mudflat and sandflat features and nity structure or distribution. No discernible or DO is predicted following cessation of the nitrogen levels are predicted.

-<u>indiscernibleeffects</u> predicted as a result of of sensitivity to the impact, and the fact that n in combination effects are likely to be similar is concluded that there will be no adverse ination increases in SSC.

WSP/Natural Power

Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
Sandbanks slightly covered by seawater all the time	Maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of the qualifying	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 is reasonably practicable and will ensu- integrity of the site as a result of invasi Due to the lack of predicted effects, all practice measures employed for any of concluded that no in combination adve- result of invasive species.
	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 (and each of 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 <u>occurringand</u> therefore will not result in Given the scale and nature of other por requirement to adhere to similar best p in combination effects, it is predicted the
	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 The distribution of qualifying species within the site	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.	integrity in combination with other plan
		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 liberar



d procedures (see section 10.2.5) will be els. This will prevent INIS introduction as far as sure that there will be no adverse effect on the sive species.

along with the application of any similar best other plan and project identified, it is verse effects will arise on this feature as a

rom vessels may occur during all ine mitigation measures of standard best ent, pollution prevention measures (Section ols will prevent these events occurring and in adverse effects on Site integrity.

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.

ment 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 tetres of the cable trench and within iment will be dispersed across a greater throughout the tidal cycle. However, due to the rated into the water column and significant

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Feature/Sub- features	Conservation Objective	Effect	Attribute	Target	Assessment
	Deposition of SedimentDistribution, presence maintain the presenceMaintain the presence sedimentSediment (Smothering)and spatial distribution of biological communitiesand spatial distribution of 	dispersion of fine sediment, it is consid sediments quickly resuspended and re Therefore, any deposition of sediment alone will be 'light', temporary in nature the feature which is not sensitive to eff			
		Deposition of Sediment (Smothering)	Structure: species composition of component communities	Restore the Species composition of component communities.	normal sediment and water movement Considering the indiscernible effects in the Proposed Development alone, and result from in combination effects are l
		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.	magnitude, it is concluded that there w from in combination effects of deposition
		Increased SSC	Supporting Processes: water quality - DO	Maintain the DO concentration at levels equating to High Ecological Status (specifically \geq 5.7 mg per	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
				litre (at 35 salinity) for 95 % of the year), avoiding deterioration from existing levels.	activities which will lead to increased S HDD pits, and cable installation (due to of fines identified between KP 5 and 15
		Increased SSC	Supporting Processes: water quality - nutrients	Restore water quality to mean winter dissolved inorganic nitrogen levels at which biological indicators of	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 \$



sidered that deposition will be negligible with redistributed under the forcing of tidal flows.

nt resulting from the Proposed Development ure and will not adversely affect the integrity of effects at this level. No discernible effects on nt, or sediment composition are predicted.

-<u>indiscernibleeffects</u> predicted as a result of nd the fact that all other activities which may e likely to be similar or lesser in extent and will be no adverse effects on site integrity ition of sediment (smothering).

ment disposal activities to outwith WFD ts 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).

o 200 mgl-1 may be observed locally (i.e. D pit) and these concentrations could ollowing completion of construction activities. e transported up to 5 km away from the trench f 5 to 10 mgl-1 are predicted. SSC is expected

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.	to return to background levels within a activities. The finest sediments will potentially be area, however SSCs at these distance discernible above natural variation.
	and spatial distribution and spatial distribution subtidal sandbank communities communities accor	Maintain the presence and spatial distribution of subtidal sandbank communities according to the map.	Natural variation ranges from approxin annual averages of between 5 – 15 mg Mudflat and sandflat habitats are not s in SSC. Therefore, considering the dis		
		Increased SSC	Structure: species composition of component communities	Restore the Species composition of component communities.	to natural variation already experience distribution are predicted. Furthermore package lists this sub-feature as not se construction, operation or decommission
		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.	outwith normal levels and any effects term, returning to background on ces nitrogen levels are predicted. It is the effects on site integrity from increase seawater all the time. Considering the indiscernible effects the Proposed Development, the lack all other activities which may result in or lesser in extent and magnitude, it i effects on site integrity from in combin

Conclusion: No 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.



a few days following completion of these

be transported up to 6-10 km in the nearshore ces will be low (< 5 mgl-1) and therefore not

imately <5 to 75 mgl-1 in coastal areas, with ngl-1 observed within surface waters.

sensitive or have low sensitivity to increases iscreet events predicted which will be similar ed, no effects on species composition or re, the Natural England Advice on Operations sensitive to nutrients at any stage of sioning. Changes DO are not expected to be to this attribute would be temporary and short station of the activity. No effects on inorganic refore concluded that there will be no adverse d SSC on Sandbanks slightly covered by

indiscernibleeffects predicted as a result of of sensitivity to the impact, and the fact that in combination effects are likely to be similar is concluded that there will be no adverse nation increases in SSC.

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10.11. MARINE: 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 SAC⁵⁰.
- 10.11.2.2. Table 10.21 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

⁵⁰

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	Increased SSC	Supporting processes: sedimentation rate		
Circalittoral rock Infralittoral rock Intertidal rock Subtidal stony reef	Deposition of sediment (smothering)	 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 Structure: physical structure of rocky substrate 		
	Pollution	Supporting processes: water quality – contaminants Supporting processes: sediment contaminants		
	Invasive Species	Structure: non-native species and pathogens		
Submerged or partially	Pollution	Supporting processes: sediment contaminants		
submerged sea caves	Invasive Species	Structure: non-native species and pathogens		
	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 		

Table 10.21 - SACO attributes screened in for assessment



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- 10.11.2.3. All other attribute/receptor combinations present within the Supplementary Advice on Conservation Objectives for this SAC were deemed to not be relevant to the effects screened into the AA.
- 10.11.3. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY
- 10.11.3.1. 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 10.22 below.
- 10.11.3.2. It is concluded that there will be no adverse effect 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.

Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
Reefs	fsmaintaining 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 	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 prevent INIS introduce and will ensure that there will be no adverse effects on invasive species. Due to the lack of predicted effects, along with the apple measures employed for any other plan and project iden 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 acti buffer of 3 km); which equates to disposal seaward of k Results of sediment plume dispersion modelling (Appen distance, 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 a 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 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 each of the qualifying species	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 indiscernible effects indiscernible 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 10.22 - 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 ction as far as is reasonably practicable n the integrity of the site as a result of

plication of any similar best practice entified, it is concluded that no in as a result of invasive species.

ctivities to outwith WFD waters (plus a 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 I that deposition will be negligible with er the forcing of tidal flows.

tely 3.3 km from the proposed HDD herefore it is considered that it will be posited. Therefore, any deposition of adversely affect the integrity of the In cessation of activities normal rates of nd composition of communities, or on the cted.

cts predicted to result from the Proposed ch may result in in combination effects are it is concluded 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 a However, routine mitigation measures of standard best management, pollution prevention measures (Section 7 will make prevent these events occurring and therefore 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 action buffer of 3 km). Results of sediment plume dispersion of that, at this distance, there will be no connectivity between and the SAC resulting from the disposal of dredge match For activities other than the deposition of dredged match 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 to It is predicted that peak SSCs of up to 200 mgl-1 may the the cable trench or HDD pit) and these concentrations hours following completion of construction activities. Set



/ occur during all development phases. st practice in terms of waste

n 10.2.5) and strict navigational protocols re will not result in adverse effects on Site

nd projects and the requirement to adhere oute to in combination effects, it is ntegrity in combination with other plans

ctivities to outwith WFD waters (plus a 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 l locations).

i be observed locally (i.e. within 2 km of s could potentially persist for several Sediment plumes are also likely to be

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Feature/Sub- features		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 a 1 are predicted. SSC is expected to return to backge completion of these activities. The finest sediments will potentially be transported however SSCs at these distances will be low (< 5 m natural variation. Natural variation ranges from approximately <5 to 7 averages of between 5 – 15 mgl-1 observed within s Most habitats present within reef environments are a those that are sensitive considered tolerant to such experienced as a result of the Proposed Development Therefore, it is considered that there will be no advect SSC on reef features. On cessation of activities, non and effects on distribution and composition of comr
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	nitrogen, are not predicted. Considering the indiscernible effects indiscerniblepred Development alone, the general lack of sensitivity to the activities which may result in in combination effects are and magnitude, it is concluded that there will be no adv combination increases 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 (e.g. concentrations of suspended sediment, plankton and other material)	



which point concentrations of 5 to 10 mglound levels within a few days following

p to 6-10 km in the nearshore area, gl-1) and therefore not discernible above

mgl-1 in coastal areas, with annual urface waters.

ot sensitive to increases in SSC, with short-term isolated events as would be nt (see sub-feature assessments below). rse effects on site integrity from increased mal levels of turbidity and DO will return, nunities, or on the levels of inorganic

<u>edicted</u> as a result of the Proposed the impact, and the fact that all other are likely to be similar or lesser in extent dverse effects on site integrity from in

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Feature/Sub- features	Conservation Objective	Effect	Attribute taken through to AA	Target	Assessment
				across the habitat.	
Circalittoral Rock	0	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 preventINIS introduce and will ensure that there will be no adverse effects or 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 (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 d However, due to the volumes of sediment likely to be I 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 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 dep sediment will be light, temporary in nature and will not
	habitats of qualifying species rely the populations of each of the qualifying species	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 indiscernible effects indiscernibleeffect 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 ef- (smothering).



ee section 10.2.5) will be followed by all action as far as is reasonably practicable on the integrity of the site as a result of

oplication of any similar best practice lentified, it is concluded 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 h any coarse material mobilised deposited le trench). Finer sediment will be depositing throughout the tidal cycle. e liberated into the water column and d 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 activities normal rates of nd composition of communities, or on the icted.

ects predicted to result from the Proposed ich may result in in combination effects are it is concluded that there will be no effects of deposition of sediment

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 action buffer of 3 km). Results of sediment plume dispersion of that, at this distance, there will be no connectivity betwo and the SAC resulting from the disposal of dredge mate 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 to It is predicted that peak SSCs of up to 200 mgl-1 may to 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	hours following completion of construction activities transported up to 5 km away from the trench or pit a 1 are predicted. SSC is expected to return to backg completion of these activities. The finest sediments will potentially be transported however SSCs at these distances will be low (< 5 m natural variation. Natural variation ranges from appr with annual averages of between 5 – 15 mgl-1 obse The closest reef feature within the SAC is approxim entry/exit pits (at their closest possible location), an outwith the area of highest SSC. Increases in SSC species and can increase scour in tide swept areas levels of sediment at the location of this subfeature within the natural background concentrations prese to be well adapted to this level of effect. No change
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	will arise Therefore, it is concluded that there will be no adverse SSC on reef features resulting from the Proposed Deve activities, normal levels of turbidity and DO will return, a nitrogen are not predicted.



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 l locations).

y 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 mglbund levels within a few days following

p to 6-10 km in the nearshore area, gl-1) and therefore not discernible above eximately <5 to 75 mgl-1 in coastal areas, ved within surface waters.

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 t, and as such the communities are likely in community composition or abundances

e effects on site integrity from increased evelopment alone. On cessation of a, and effects on the levels of inorganic

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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 indiscernible effects predicted as a re- the general lack of sensitivity to the impact, and the fac result in in combination effects are likely to be similar of concluded that there will be no adverse effects on site increases in SSC.
		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.	
Infralittoral Rock	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 prevent INIS introduce and will ensure that there will be no adverse effects on 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 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
	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 d However, due to the volumes of sediment likely to be li



esult of the Proposed Development alone, fact that all other activities which may or lesser in extent and magnitude, it is the integrity from in combination effects from

ee section 10.2.5) will be followed by all luction as far as is reasonably practicable on the integrity of the site as a result of

oplication of any similar best practice lentified, it is concluded 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 ne SAC resulting from dredge disposal

Huding 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

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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 approximate entry/exit pits (at their closest possible location), and the outwith the area where the majority of sediment is dependent
	habitats and the habitats of qualifying species rely the populations of each of the qualifying species the distribution of qualifying species	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 predict Considering the indiscernible effects indiscernibleeffect 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.
	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 prevent these events occurring and therefore will n 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 int 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 is 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 lo



d 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 posited. Therefore, any deposition of ot adversely affect the integrity of the On cessation of activities normal rates of nd composition of communities, or on the icted.

<u>ects</u> predicted to result from the Proposed ch may result in in combination effects are it is concluded 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 not result in adverse effects on Site

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 tween 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).

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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 w 1 are predicted. SSC is expected to return to background
		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	The finest sediments will potentially be transported up to however SSCs at these distances will be low (< 5 mgl-1 natural variation. Natural variation ranges from approxin with annual averages of between 5 – 15 mgl-1 observe The closest reef feature within the SAC is approximatel entry/exit pits (at their closest possible location), and th outwith the area of highest SSC. Increases in SSC can species and can increase scour in tide swept areas (Re levels of sediment at the location of this subfeature are concentrations present, and as such the communities w As such, no changes in community composition or abut Therefore, it is concluded that there will be no adverse SSC on reef features resulting from the Proposed Deve
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	 activities, within days normal levels of turbidity and DO of inorganic nitrogen are predicted. Considering the indiscernible effects predicted as a rest the general lack of sensitivity to the impact, and the fact result in in combination effects are likely to be similar or concluded that there will be no adverse effects on site it increases 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 (e.g.	



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, -1) and therefore not discernible above kimately <5 to 75 mgl-1 in coastal areas, red within surface waters.

ely 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 within the natural background s will bewell adapted to this level of effect. oundances will arise.

e effects on site integrity from increased velopment alone. On cessation of O will return, and no effects on the levels

esult of the Proposed Development alone, act that all other activities which may or lesser in extent and magnitude, it is e integrity from in combination effects from

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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 Rock	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 prevent INIS introduce and will ensure that there will be no adverse effects on 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 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
	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 d 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	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 app 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
	habitats of qualifying species rely the populations of	Deposition of Sediment (Smothering)	Structure: physical structure of rocky substrate	Maintain the surface and structural complexity, and	are considered possible. In addition, due to the fact that project alone through deposition of sediment, no in-cor possible.



ee section 10.2.5) will be followed by all fuction as far as is reasonably practicable on the integrity of the site as a result of

oplication of any similar best practice lentified, it is concluded 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 ne SAC resulting from dredge disposal

Huding 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 concluded that it will

ct the integrity of the feature as no effects hat no effects are predicted from the combination adverse effects are considered

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Feature/Sub- features	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 a However, routine mitigation measures of standard best management, pollution prevention measures (Section 4 will prevent these events occurring and occurring and the 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 activities of 3 km). Results of sediment plume dispersion in this distance, there will be no connectivity from increases. For activities other than the deposition of dredged material 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 hours following completion of construction activities. Set transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the trench or pit at we set the transported up to 5 km away from the
		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	 1 are predicted. SSC is expected to return to backgrou completion of these activities. The finest sediments will potentially be transported up however SSCs at these distances will be low (< 5 mgl-natural variation. The closest intertidal rock habitat within the SAC is app HDD entry/exit pits (at their closest possible location), a be outwith the area of significantly increased SSC, with within the natural background of variation present. Natural variation



y occur during all development phases. est practice in terms of waste n 10.2.5) and strict navigational protocols therefore will not result in adverse effects

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) indicate that, at ased SSC with the SAC.

aterial, the worst-case activities which will on at the HDD pits, and cable installation f 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 which point concentrations of 5 to 10 mglound levels within a few days following

p to 6-10 km in the nearshore area, gl-1) and therefore not discernible above

pproximately 10 km from the proposed and therefore it is considered that it will ith any received levels not discernible atural variation ranges from approximately

Feature/Sub- features	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, there will be no effects on turbid
		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 inc Considering the indiscernible effects predicted as a res lack of sensitivity to the impact, and the fact that all oth combination effects are likely to be similar or lesser in that there will be no adverse effects on site integrity fro 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 (e.g. 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 prevent INIS introduce and will ensure that there will be no adverse effects on 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 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 idity or DO and no effects on distribution inorganic nitrogen.

result of the Proposed Development, the other activities which may result in in n extent and magnitude, it is concluded from in combination effects from increases

ee section 10.2.5) will be followed by all luction as far as is reasonably practicable on the integrity of the site as a result of

oplication of any similar best practice lentified, it is concluded that no in as a result of invasive species.

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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 (Appe distance, 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 (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 de However, due to the volumes of sediment likely to be lis significant dispersion of fine sediment, deposition will be
	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.	resuspended and redistributed under the forcing of tida 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 depo- sediment will be light, temporary in nature and will not
	habitats and the habitats of qualifying species rely the populations of each of the qualifying species the distribution of	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 predict Considering the indiscernible effects indiscernible 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 eff (smothering).
	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 prevent these events occurring and therefore will n 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.



ctivities to outwith WFD waters (plus a f KP21 of the Marine Cable Corridor. bendix 6.2 of ES) indicate that, at this e SAC resulting from dredge disposal

uding excavation of HDD pits between n any coarse material mobilised deposited e trench). Finer sediment will be depositing throughout the tidal cycle. liberated into the water column and be negligible with sediments quickly dal flows.

ately 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 activities normal rates of and composition of communities, or on the cted.

ects predicted to result from the Proposed ch may result in in combination effects are it is concluded that there will be no effects from deposition of sediment

v occur during all development phases. st practice in terms of waste

10.2.5) and strict navigational protocols not result in adverse effects on site

nd projects and the requirement to adhere ute to in combination effects, it is ntegrity in combination with other plans

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Feature/Sub- 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 activities of 3 km). Results of sediment plume dispersion in that, at this distance, there will be no connectivity betwee and the SAC resulting from the disposal of dredge materies other than the deposition of dredged materies 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 is 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 to however SSCs at these distances will be low (< 5 mgl- natural variation. Natural variation ranges from approxin with annual averages of between 5 – 15 mgl-1 observe 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 affect feeding efficiency of filter f in tide swept areas (Readman, 2016). The likely receive this subfeature are however within the natural backgrout the communities are well adapted to this level of effect. composition or abundances are considered likely to arise
		Increased SSC	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal rock communities according to the map.	Therefore, it is considered that there will be no adverse SSC on reef features resulting from the Proposed Deve activities, normal levels of turbidity and DO will return, a nitrogen are predicted. Considering the indiscernible effects predicted as a res the general lack of sensitivity to the impact, and the fac



ctivities to outwith WFD waters (plus a 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).

v 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, I-1) and therefore not discernible above ximately <5 to 75 mgl-1 in coastal areas, ved within surface waters.

ely 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 ound concentrations present, and as such ct. As such, no changes in community rise.

se effects on site integrity from increased velopment alone. On cessation of , and no effects on the levels of inorganic

esult of the Proposed Development alone, act that all other activities which may

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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.	result in in combination effects are likely to be similar of concluded that there will be no adverse effects on site in SSC.
		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.	
Submerged or partially submerged sea caves	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 prevent INIS introdu and will ensure that there will be no adverse effects on 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 a
	of the qualifying species the structure and function (including typical species) of qualifying natural habitats the structure and function of the	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 prevent these events occurring and occurring and the 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.
	habitats of the qualifying species	Pollution	Supporting processes: water	Restrict aqueous contaminants to levels equating to	



r or lesser in extent and magnitude, it is the integrity from in combination increases

ee section 10.2.5) will be followed by all duction as far as is reasonably practicable on the integrity of the site as a result of

oplication of any similar best practice lentified, it is concluded that no in as a result of invasive species.

y occur during all development phases. est practice in terms of waste

n 10.2.5) and strict navigational protocols

nd projects and the requirement to adhere oute to in combination effects, it is integrity in combination with other plans

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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	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 (Appe distance, there no will be sediment deposition with the
	within the site	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 (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 de 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/exi 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 tha project alone through deposition of sediment, no in-cor possible.



ctivities 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

Adding excavation of HDD pits between th any coarse material mobilised deposited le trench). Finer sediment will be depositing throughout the tidal cycle. We 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 hat no effects are predicted from the combination adverse effects are considered

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Feature/Sub- features 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 to 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.	 1 are predicted. SSC is expected to return to background completion of these activities. The finest sediments will potentially be transported up to however SSCs at these distances will be low (< 5 mgl-1 natural variation. 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 any received levels not discernible within the natural background variation ranges from approximately <5 to 75 mgl-1 in the 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 background is an one offects on turbidity or DO are predicted, and no effect communities, or on the levels of inorganic nitrogen, are considering the indiscernible effects predicted as a rest of the i
	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 indiscernible effects predicted as a res lack of sensitivity to the impact, and the fact that all oth 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 n 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 f 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 which point concentrations of 5 to 10 mglbund levels within a few days following

p to 6-10 km in the nearshore area, JI-1) and therefore not discernible above

eaves feature within the SAC is exit pits (at their closest possible location), e area of significantly increased SSC, with background of variation present. Natural n coastal areas, with annual averages of s. Submerged and partially submerged v to increases in SSC, and considering the of the feature are predicted. As the background of SSC typically experienced, fects on distribution and composition of are envisaged.

esult of the Proposed Development, the ther activities which may result in in n extent and magnitude, it is concluded rom in combination effects from increases

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Feature/Sub- features	Effect	Attribute taken through to AA	Target	Assessme
	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 (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.	

Conclusion: No 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. MARINE: 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 SAC⁵¹. Table 10.23 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.23 - 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;

⁵¹ <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 10.24 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 10.24 - 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
Salmon The populations of qualifying species Increased SSC Population: Adult run size Restore the population to under un-impacted condit for natural fluctuations. This include a seasonal patter characteristic of the river maintenance of the multicomponent. Ensure that the exceeds its Conservation of 5 years The minimum despawning stock levels (exannual number of eggs debelow which stocks shoul allowed to fall. Conservat River Itchen is considered million eggs per year. Population: Juvenile Restore juvenile densities The structure and The structure and Supporting The movement of characteristic of the route and the structure and the	· ·	Adult run size Adult run size Population: Juvenile	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 installated SSC of 1000 mgl ⁻¹ could arise within 1 km free sediment is expected to fall out of suspensions significant reductions of SSC within hours of km from release, the passive plume which it generate SSC in the region of approximate of the prevailing flow out to a distance of c. background levels (<1 – 6 mg/l) within the the considered to be excavation at the HDD pitter of the the prevail of the pr	
			Juvenile	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 f and in other isolated locations). The marine approx. 1 km off the coast of Eastney (KP 2 using a backhoe dredger or Mass Flow Exc excavated is up to 2,700 m ³ . The finest sec
	The movement of characteristic biota should not be artificially constrained.	up to 10 km in the nearshore area, howe (<5 mg/l) and therefore not discernible a peak SSCs of up to 200 mg/l may be ob cable trench/HDD pit) and these concern			
			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.	several hours following completion of const are also likely to be transported up to 5 km point concentrations of 5 to 10 mg/l are pre background levels within a few days following SSCs can elicit a short and long-term response the quantity, quality and duration of the exp suspended sediment on migratory fish is or (Robertson <i>et al.</i> , 2007). This, in part, is due to move away from the impact. Given that se



elates to the sediment released as 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 ission quickly (almost immediately) with is of disposal at each location. Beyond 1 h is transported beyond this is likely to tely 20 mgl⁻¹, 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 ver SSCs at these distances will be low pove natural variation, It is predicted that erved locally (i.e. within 2 km of the rations could potentially persist for instruction activities. Sediment plumes m away from the trench/pit at which redicted; SSC is expected to return to wing completion of these activities.

ponse from aquatic biota depending on xposure. The greatest impact of on incubating eggs and larval stages due to their lack of mobility and inability it salmon spawn in freshwater there is no

Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					route to impact on salmon eggs or larvae. A 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 concluded 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 in 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 potent and smolts during their spawning or seawar pollution and preference for surface waters. However, routine mitigation measures of sta management, pollution prevention measure navigational protocols will prevent these ever result in adverse effects on site integrity. Given the scale and nature of other potential requirement to adhere to similar best praction in combination effects, it is predicted that the integrity in combination with other plans and
			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	



Adult salmon exhibit strong swimming or navigate around an impacted area so inherently tolerant of naturally high ided sediment (Heard, 2007). This is iverine environment and are frequently nent due to flood events and land run

e no adverse effects on site integrity he 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 concluded that will be no adverse on effects from increases in SSC.

vessels may occur during all ential to directly affect both adult salmon ard migrations given their sensitivity to rs.

standard best practice in terms of waste res (Section 10.2.5) and strict events occurring and therefore will not

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	Assess
	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 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. MARINE: 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 SAC⁵² Table 10.25 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
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

Table 10.25 - Conservation and Supplementary Advice attributes screened in for assessment

⁵² <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 10.26 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 10.26 - 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 S as a result of the cable installation and disposal activities, route cleara offshore and nearshore areas. The worst case for increased SSC is considered to arise through depo- required for sandwave clearance, p disposal, peak SSC of 1000 mgl ⁻¹ of point but coarser sediment expected (almost immediately) with significant disposal at each location. Beyond the significant which is transported beyond this is
functio		of the habitats	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 ⁻¹ , transported out to a distance of c. 25km. SSC i levels (<1 – 6 mg/l) within the time completion of disposal activities. The worst case for increased SSC 21) is considered to be excavation (due to the potential for the liberation
	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 SSCs at and therefore not discernible above peak SSCs of up to 200 mg/l may be the cable trench/HDD pit) and thes persist for several hours following of Sediment plumes are also likely to the trench/pit at which point concerned SSC is expected to return to back following completion of these activity



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 ted to fall out of suspension quickly ant 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 sing a backhoe dredger or Mass Flow me to be excavated is up to $2,700 \text{ m}^3$. ally be transported up to 10 km in the t these distances will be low (<5 mg/l) ve natural variation, It is predicted that be observed locally (i.e. within 2 km of ese concentrations could potentially completion of construction activities. o be transported up to 5 km away from entrations of 5 to 10 mg/l are predicted; ground levels within a few days vities.

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
					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, 19
					Therefore, it is concluded that there integrity from increased SSC on this Development alone.
					Considering the indiscernible effect result of the Proposed development impact, and the fact that all other ac combination effects are likely to be magnitude, it is concluded that there integrity from in combination effects
	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 level as indicated by the latest count or equivalent.	Unplanned oil or chemical spillages development phases. Spills have the sea lamprey and transformers during migrations given their sensitivity to However, routine mitigation measure of waste management, pollution pre- and strict navigational protocols will <u>occurringand</u> therefore will not resure 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 conditions and allowing for natural fluctuations.	adverse effect on site integrity in co projects.



is 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 rally contain up to several thousand mg/l 1998).

ere will be no adverse effects on site his feature from the Proposed

ets <u>indiscernibleeffects</u> predicted as a ent, the general lack of sensitivity to the activities which may result in in be similar or lesser in extent and ere will be no adverse effects on site cts from increases 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 prevent these events occurring and sult in adverse effects on site integrity.

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	
	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	expected under un-impacted conditions, allowing for natural fluctuations. This	The potential impact of increased s as a result of the cable installation and disposal activities, route cleara offshore and nearshore areas.		
					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.	The worst case for increased SSC is considered to arise through depo- required for sandwave clearance, disposal, peak SSC of 1000 mgl ⁻¹ point but coarser sediment expected (almost immediately) with significa- disposal at each location. Beyond which is transported beyond this is approximately 20 mgl ⁻¹ , transported
				As a minimum, the Conservation Limit for the river system should be complied with.	out to a distance of c. 25km. SSC levels ($<1 - 6$ mg/l) within the time completion of disposal activities. The worst case for increased SSC	
			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	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 Excavator ('MFE'). The total volum The finest sediments will potential	



d SSC relates to the sediment released on and associated works such as dredge arance and rock placement for both the

⁵C in the offshore area (seaward of KP21) eposit of dredge material which may be e, prior to cable installation. During dredge ⁻¹ could arise within 1 km from the release cted to fall out of suspension quickly cant reductions of SSC within hours of d 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 heframe of a few days following

C 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 time to be excavated is up to 2,700 m³. ally be transported up to 10 km in the

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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	Restore the free movement of the typical species of the SAC feature through the site.	nearshore area, however SSCs at t and therefore not discernible above peak SSCs of up to 200 mg/l may b the cable trench/HDD pit) and these
			Structure and function: Supporting off-site habitat	Maintain habitats beyond the site boundary upon which characteristic biological communities of the SAC may depend	persist for several hours following c Sediment plumes are also likely to the trench/pit at which point concern SSC is expected to return to backge following completion of these activit
					SSCs can elicit a short- and long-ter depending on the quantity, quality a greatest impact of suspended sedim 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 to impacted area e.g. areas of increase tolerant of naturally high and variab sediment (Heard, 2007). This is also riverine environment and are freque suspended sediment due to flood e
					Therefore, it is concluded that there integrity from increased SSC on this Development alone.
					Considering the indicernible effects Developments, the general lack of s that all other activities which may re to be similar or lesser in extent and are no adverse effects on site integ SSC.



t these distances will be low (<5 mg/l) ve natural variation, It is predicted that v be observed locally (i.e. within 2 km of ese concentrations could potentially completion of construction activities. o be transported up to 5 km away from entrations of 5 to 10 mg/l are predicted; aground levels within a few days vities.

term response from aquatic biota y 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 calmon on the other hand exhibit strong to swim through or navigate around an ased SSC. They are also inherently able background levels of suspended lso 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

is predicted as a result of the Proposed of sensitivity to the impact, and the fact result in in combination effects are likely and magnitude, it is concluded that there egrity from in combination increases 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 spat their sensitivity to pollution and prefect However, routine mitigation measure of waste management, pollution pre- and strict navigational protocols will <u>occurringand</u> therefore will not resure 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	
	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 pawning or seaward migrations given reference for surface waters.

sures of standard best practice in terms prevention measures (Section 10.2.5) will prevent these events occurring and sult in adverse effects on site integrity.

er potential plans and projects and the pest practice measures which could its, 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: N projects.	No adverse effect on site	integrity can be concl	uded for the River Av	on SAC, arising from either th	e Proposed Development alone, or



or in combination with other plans or

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10.14. MARINE: 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 SAC⁵³. 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
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;

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⁵³ <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 10.28 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 10.28 - 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 spillages development phases. Spills have the sea lamprey and transformers during migrations given their sensitivity to However, routine mitigation measure of waste management, pollution pre- and strict navigational protocols will <u>occurringand</u> therefore will not resure 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.	
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.	



es from vessels may occur during all the potential to directly affect both adult ring their spawning or seaward to pollution.

sures of standard best practice in terms prevention measures (Section 10.2.5) will prevent these events occurring and sult in adverse effects on Site integrity.

er potential plans and projects and the pest practice measures which could its, 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: N projects.	No adverse effect on site	integrity can be concl	uded for the River Ax	e SAC, arising from either the	Proposed Development alone, or in



r in combination with other plans or

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10.15. MARINE: 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 SAC⁵⁴. 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
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;
 - 54

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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 10.30 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 spillages development phases. Spills have th 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 <u>occurringand</u> therefore will not resure from the Proposed Development and Given the scale and nature of other requirement to adhere to similar bear contribute to in combination effects adverse effect on site integrity in com-
	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 10.30 - 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 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

sures of standard best practice in terms prevention measures (Section 10.2.5) vill prevent these events occurring and sult in adverse effects on site integrity 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. MARINE: LITTORAL CAUCHOIS SAC

10.16.1. **OVERVIEW**

- 10.16.1.1. Littoral Cauchois SAC covers approximately 63 km² of the French coast from Le Treport to Le Havre. It is designated for both marine and terrestrial habitats and species (EEA, 2019a). The SAC 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 SAC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC⁵⁵ 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 SAC as these are site specific. Table 10.31 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.31 - 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

⁵⁵ <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)

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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 document⁵⁶;
 - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document⁵⁷;
 - Grey seal: Pembrokeshire Marine SAC document⁵⁸ and the SACOs page of Natural England's Designated Sites View website for the Humber SAC⁵⁹; and
 - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC⁶⁰.
- 10.16.3.2. Table10.32 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 10.32 - 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

⁵⁶ https://cdn.naturalresources.wales/media/687993/eng-cardigan-bay-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929023330000000

⁵⁷ http://jncc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf

⁵⁸ https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929024980000000

⁵⁹ <u>https://designatedsites.naturalengland.org.uk/</u>

⁶⁰ <u>https://designatedsites.naturalengland.org.uk/</u>



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 10.33 and 10.34 below.
- 10.16.4.2. It is concluded that there will be no adverse effects on site integrity for Littoral Cauchois SAC, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10.33 - Assessment of potential adverse effects on site integrity for Annex II fish species of the Littoral Cauchois 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
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 prevent these preventthese events occu adverse effects on 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 potential plans ar adhere to similar best practice measures which could is predicted that there will be no adverse effect on site plans and projects.
River lampreyThe populations of qualifying speciesPopulation: Juvenile densitiesThe structure and function of the habitats	Pollution events	Population: population abundance	N/A	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	N/A	However, routine mitigation measures of standard be management, pollution prevention measures (Section
			Supporting habitat: Biological connectivity	N/A	protocols will prevent these events occurring and occ adverse effects on site integrity.
			Supporting habitats: Integrity of off-site habitats	N/A	Given the scale and nature of other potential plans a adhere to similar best practice measures which coul is predicted that there will be no adverse effect on si plans and projects.
Sea lamprey The populations of qualifying species Pollution events The structure and function of the habitats of qualifying species Pollution events		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 sens
			Population: Juvenile densities	N/A	However, routine mitigation measures of standard be management, pollution prevention measures (Section protocols will prevent these events occurring and occ
	Supporting habitat: Biological connectivity	N/A	adverse effects on site integrity from the Proposed De Given the scale and nature of other potential plans ar adhere to similar best practice measures which could		



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 curring and therefore will not result in 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 curringand therefore will not result in

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 curringand therefore will not result in Development alone.

and projects and the requirement to Id contribute to in combination effects, it

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Feature	Conservation Objectives	Effect	Attribute	Target	Assessment
			Structure and function: Supporting off-site habitat	N/A	is predicted that there will be no adverse effect on site plans and projects.
Conclusion:	No adverse effect on site	integrity can be conc	luded for the Littoral (auchois SAC	arising from either the Proposed Development alc

onclusion: No adverse effect on site integrity can be concluded for the Littoral Cauchois SAC, arising from either the Proposed Development alone, or in combination with other plans or projects.

Table 10.34 - Assessment of potential adverse effects on site integrity for marine mammal species in the Littoral Cauchois SAC 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: The extent and distribution of 	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 effectively Similar best practice measures are employed for the
Grey seal	 species; The structure and function (including typical species) of qualifying natural habitats; 	Pollution	Supporting processes: water quality - contaminants	NA	which could contribute to in combination effects. Therefore, it is concluded that adhering to mitigation r no adverse effects on site integrity, either alone or in projects
Harbour seal	 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	Supporting processes: water quality - contaminants	NA	projects.

Conclusion: No 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

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

n measures will ensure that there will be n combination with other plans or

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10.17. MARINE: ESTUAIRES ET LITTORAL PICARDS (BAIES DE SOMME ET D'AUTHIE) SAC/ BAIE DE SOMME RAMSAR

10.17.1. **OVERVIEW**

- 10.17.1.1. Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC/Baie De Somme Ramsar 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 SAC does not overlap the UK Marine Cable Corridor and is 84.6 km distant at its closest point.
- 10.17.1.2. River lamprey is qualifying feature of the SAC 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) SAC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC⁶¹ 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) SAC as these are site specific. Table 10.35 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.35 - 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

⁶¹ <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)



- 10.17.2.2. 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;
 - 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 document⁶²;

⁶² <u>https://cdn.naturalresources.wales/media/687993/eng-cardigan-bay-reg-37-report-</u>2018.pdf?mode=pad&rnd=131929023330000000



- Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document⁶³;
- Grey seal: Pembrokeshire Marine SAC document⁶⁴ and the SACOs page of Natural England's Designated Sites View website for the Humber SAC⁶⁵; and
- Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC⁶⁶.
- 10.17.3.2. Table 10.36 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 10.36 - 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

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⁶³ http://jncc.defra.gov.uk/pdf/SNorthSea_ConsAdvice.pdf

⁶⁴ https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929024980000000

⁶⁵ <u>https://designatedsites.naturalengland.org.uk/</u>

⁶⁶ <u>https://designatedsites.naturalengland.org.uk/</u>



- 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

10.17.4. 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 10.37 and Table 10.38 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) SAC/Baie de Somme Ramsar, either from the Proposed Development alone, or in combination with other plans or projects

Table 10.37 - Assessment of potential adverse effects on site integrity for Estuaires et Littoral Picards (Baies de Somme et d'Authie) 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	
River lamprey	The 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 duri migrations given their sensitivity to	
	Population: Juvenile densities		Population: Juvenile densities	N/A	However, routine mitigation measur of waste management, pollution pre and strict navigational protocols will occurringand therefore will not resu	
	The structure and function of the habitats of qualifying species		of the habitats	Supporting habitat: Biological connectivity	N/A	from the Proposed Development alo Given the scale and nature of other
			Supporting habitats: Integrity of off-site habitats	N/A	requirement to adhere to similar best contribute to in combination effects, adverse effect on site integrity in co projects.	

Conclusion: No adverse effect on site integrity can be concluded for the Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC arising from either the Proposed Development alone, or in combination with other plans or projects.

Table 10.38 - Assessment of potential adverse effects on site integrity for the Estuaires et littoral picards (baies de Somme et d'Authie) SAC/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	Maintain or restore: The extent and distribution of	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 species;	Pollution	NA	NA	section 10.2.5). In the unlikely event of pollution even outlines procedures and responsibilities for effectively Similar best practice measures are employed for the o
Grey seal	The structure and function (including typical species) of qualifying natural habitats; The structure and function of the	Pollution	Supporting processes: water quality - contaminants	NA	which could contribute to in combination effects. Therefore, it is concluded that adhering to mitigation r no adverse effects on site integrity, either alone or in
Harbour seal	habitats of the qualifying species; The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;	Pollution	Supporting processes: water quality - contaminants	NA	projects



s 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 prevent these events occurring and sult in adverse effects on site integrity 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 very of the Proposed Development (see ents occurring, the same mitigation ely managing any events.

e other plans and projects identified

measures will ensure that there will be n combination with other plans and

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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.		5		

Conclusion: No adverse effect on site integrity can be concluded for the Estuaires et Littoral Picards (Baies de Somme et d'Authie) SAC/Baie de Somme Ramsar arising from either the Proposed Development alone, or in combination with other plans or projects.



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10.18. MARINE: BAIE DE CANCHE ET COULOIR DES TROIS ESTUAIRES SAC

10.18.1. **OVERVIEW**

- 10.18.1.1. Baie de Canche et Couloir des trois Estuaires SAC covers approximately 33,306 ha of the French coast from Ault to Camiers. It is designated for both marine and estuarine habitat and species (EEA, 2019c). The SAC 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 Estuaires SAC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC⁶⁷ 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 Estuaires SAC as these are site specific. Table 10.39 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.39 - 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

⁶⁷ <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)

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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 document⁶⁸;
 - Grey seal: Pembrokeshire Marine SAC document⁶⁹ and the SACOs page of Natural England's Designated Sites View website for the Humber SAC⁷⁰; and
 - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC⁷¹.
- 10.18.3.2. Table 10.40 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 10.40 - 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

⁶⁸ http://jncc.defra.gov.uk/pdf/SNorthSea ConsAdvice.pdf

⁶⁹ https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929024980000000

⁷⁰ <u>https://designatedsites.naturalengland.org.uk/</u>

⁷¹ <u>https://designatedsites.naturalengland.org.uk/</u>



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 10.41 and Table 10.42 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 Estuaires SAC, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10.41 - Assessment of potential adverse effects on site integrity for Baie de Canche et Couloir des trois Estuaires SAC across all phases of the Proposed Development both alone and in combination with other plans and projects

Feature	Conservation Objectives	Effects	Attribute	Target	Assessment
Salmon	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 measure of waste management, pollution pre- and strict navigational protocols will therefore occurringtherefore will not
	The structure and function of the habitats of qualifying species		Supporting habitat: biological connectivity	N/A	integrity from the Proposed Devel Given the scale and nature of othe requirement to adhere to similar b contribute to in combination effect adverse effect on site integrity in o projects.
	The supporting processes on which qualifying natural habitat and habitats of qualifying species rely		Supporting processes: integrity of off-site habitats	N/A	
Allis shad	The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillage development phases. Spills have to during their spawning migrations g However, routine mitigation measu of waste management, pollution pro and strict navigational protocols with <u>occurringand</u> therefore will not rest from the Proposed Development a
			Population: juvenile densities	N/A	
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	
	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 bawning or seaward migrations given reference for surface waters.

sures of standard best practice in terms prevention measures (Section 10.2.5) will prevent these events occurring not result in adverse effects on site lopment 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 prevent these events occurring and sult in adverse effects on site integrity 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	of waste mana	However, routine mitigation measu of waste management, pollution pre and strict navigational protocols wil
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	therefore <u>occurringtherefore</u> will not integrity from the Proposed Develop
			Supporting habitats: 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.
Sea lamprey	The populations of qualifying species	Pollution events	Population: Population abundance	N/A	Unplanned oil or chemical spillages development phases. Spills have th sea lamprey and transformers durin
			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 <u>occurringand</u> therefore will not resu from the Proposed Development al
			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 adverse effect on site integrity can be concluded for the Baie de Canche et couloir des trois estuaires SAC 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) will prevent these events occurring not result in adverse effects on site lopment 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 prevent these events occurring and sult in adverse effects on site integrity 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 10.42 - Assessment of potential adverse effects on site integrity for the Baie de Canche et couloir des trois estuaires SAC 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 pr preventing 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.
Harbour seal	 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	Supporting processes: water quality - contaminants	NA	Therefore, it is concluded that adhering to mitigation m no adverse effects on site integrity, either alone or in c

Conclusion: No adverse effect on site integrity can be concluded for the Baie de Canche et couloir des trois estuaires SAC 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

measures will ensure that there will be combination.

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10.19. MARINE: BAIE DE SEINE ORIENTALE SAC

10.19.1. **OVERVIEW**

- 10.19.1.1. Baie de Seine Orientale SAC covers approximately 44,402 ha of the French marine area off the coast of Ouistreham. It is designated for both marine habitats and species (EEA, 2019d). The SAC 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 SAC. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC⁷² 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 SAC as these are site specific. Table 10.43 lists those attributes which are considered to be equivalent to those impacts for which an LSE could not be excluded.

Table 10.43 - 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

⁷² <u>http://publications.naturalengland.org.uk/publication/6096799802589184</u> (Accessed: 17 October 2019)

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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 document⁷³;
 - Harbour porpoise: Southern North Sea SAC Conservation Advice and Advice on Operations document⁷⁴;

⁷³ https://cdn.naturalresources.wales/media/687993/eng-cardigan-bay-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929023330000000

⁷⁴ <u>http://jncc.defra.gov.uk/pdf/SNorthSea_ConsAdvice.pdf</u>



- Grey seal: Pembrokeshire Marine SAC document⁷⁵ and the SACOs page of Natural England's Designated Sites View website for the Humber SAC⁷⁶; and
- Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC⁷⁷.
- 10.19.3.2. Table 10.44 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 10.44 - 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

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⁷⁵ <u>https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-</u>

^{2018.}pdf?mode=pad&rnd=131929024980000000

⁷⁶ <u>https://designatedsites.naturalengland.org.uk/</u>

⁷⁷ https://designatedsites.naturalengland.org.uk/



- 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 10.45 and Table 10.46 below.
- 10.19.4.2. It is concluded that there will be no adverse effects on site integrity for Baie de Seine Orientale SAC, either from the Proposed Development alone, or in combination with other plans or projects.

Table 10.45 - Assessment of potential adverse effects on site integrity for Annex II fish species of Baie de Seine Orientale 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
Twaite shad	The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillage development phases. Spills have t shad during their spawning migrati However, routine mitigation measu of waste management, pollution pr
			Population: juvenile densities	N/A	
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	and strict navigational protocols will <u>occurringand</u> therefore will not result from the Proposed Development al
	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.
Salmon	The populations of qualifying species	Pollution events	Population: adult run size	N/A	Unplanned oil or chemical spillage development phases. Spills have salmon and smolts during their sp their sensitivity to pollution and pr However, routine mitigation meas of waste management, pollution p and strict navigational protocols w <u>occurringand</u> therefore will not res from the Proposed Development a
			Population: juvenile densities	N/A	
	The structure and function of the habitats of qualifying species		Supporting habitat: biological connectivity	N/A	
	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.
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 gi
			Population: juvenile densities	N/A	However, routine mitigation measu of waste management, pollution pr



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 prevent these events occurring and sult in adverse effects on site integrity 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 prevent these events occurring and sult in adverse effects on site integrity 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 will <u>occurringand</u> therefore will not resu from the Proposed Development al
	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 th 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 will <u>occurringand</u> therefore will not resu from the Proposed Development al
			Supporting habitats: 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.
Sea lamprey	The populations of qualifying species	Pollution events	Population: Population abundance	N/A	Unplanned oil or chemical spillages development phases. Spills have th
			Population: Juvenile densities	N/A	sea lamprey and transformers durin migrations given their sensitivity to
	The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	However, routine mitigation measured of waste management, pollution present and strict navigational protocols will occurring and therefore will not resured the strict management and strict navigational protocols will not resured the strict navigation and strict na
			Structure and function: Supporting off-site habitat	N/A	from the Proposed Development ale Given the scale and nature of other requirement to adhere to similar be contribute to in combination effects



vill prevent these events occurring and sult in adverse effects on site integrity 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) will prevent these events occurring and sult in adverse effects on site integrity 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) will prevent these events occurring and sult in adverse effects on site integrity 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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onservation ojectives	Effect	Attribute	Target	Assessment
				adverse effect on site integrity in co projects.

Conclusion: No adverse effect on site integrity can be concluded for the Baie de Seine orientale SAC arising from either the Proposed Development alone, or in combination with other plans or projects.

Table 10.46 - Assessment of potential adverse effects on site integrity for marine mammal features of the Baie de Seine orientale ZSC across all	ph
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 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	Pollution	NA	NA	Mitigation included in the dML requires that the best p preventing pollution events are followed during delive
Harbour porpoise		Pollution	NA	NA	section 10.2.5). In the unlikely event of pollution even 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. Therefore, it is concluded that adhering to mitigation r no adverse effects on site integrity, either alone or in
Harbour seal		Pollution	Supporting processes: water quality - contaminants	NA	projects.

Conclusion: No adverse effect on site integrity can be concluded for the Baie de Seine orientale SAC 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

t 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

n measures will ensure that there will be n combination with other plans or

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10.20. MARINE: 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 document⁷⁸;
 - Grey seal: Pembrokeshire Marine SAC document⁷⁹ and the SACOs page of Natural England's Designated Sites View website for the Humber SAC⁸⁰; and
 - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC⁸¹.
- 10.20.2.2. 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.

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 10.47 - SACO attributes screened in for assessment

⁷⁸ http://jncc.defra.gov.uk/pdf/SNorthSea_ConsAdvice.pdf

⁷⁹ https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929024980000000

⁸⁰ <u>https://designatedsites.naturalengland.org.uk/</u>

⁸¹ <u>https://designatedsites.naturalengland.org.uk/</u>



- 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 10.48 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 10.48 - Assessment of potential adverse effects on site integrity for the Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC 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 pro-
porpoise	The extent and distribution of qualifying natural habitats and habitats of the qualifying species; The structure and function (including typical species) of qualifying natural				preventing pollution events are followed during delivery section 10.2.5). In the unlikely event of pollution events
Grey seal		Pollution	Supporting processes: water quality -	NA	outlines procedures and responsibilities for effectively r
			contaminants		Similar best practice measures are employed for the could contribute to in combination effects.
Harbour	habitats;	Pollution	ution Supporting processes: water quality - contaminants	NA	Therefore, it is concluded that adhering to mitigation in no adverse effects on site integrity, either alone or in projects.
seal	The structure and function of the habitats of the qualifying species;	water qu			
	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 adverse effect on site integrity can be concluded for the Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC 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

measures will ensure that there will be combination with other plans or

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10.21. MARINE: ESTUAIRE DE LA SEINE SAC/MARAIS VERNIER RAMSAR

10.21.1. **OVERVIEW**

- 10.21.1.1. Estuaire de la Seine SAC/Marais Vernier Ramsar does not overlap the Marine Cable Corridor and is approximately 90 km from the Proposed Development.
- 10.21.1.2. Twaite shad, salmon, river lamprey, and sea lamprey are Annex II fish qualifying features of this site. Harbour porpoise, grey seal and harbour seal are qualifying features of the SAC but not the Ramsar.
- 10.21.2. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): ANNEX II MIGRATORY DIADROMOUS FISH SPECIES
- 10.21.2.1. Site-specific SACO is not available for the Estuaire de la Seine SAC / Marais Vernier Ramsar. As such, the Conservation Objectives and Supplementary Advice document for the River Wye SAC⁸² 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 Estuaire de la Seine SAC as these are site specific. Table 10.49 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
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

Table 10.49 - Conservation and Supplementary Advice attributes screened in for assessment.

82 http://publications.naturalengland.org.uk/publication/6096799802589184 (Accessed: 17 October 2019)

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Feature	Impact for which LSE could not be excluded	Equivalent attribute
		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

10.21.2.2. 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.

10.21.3. CONSERVATION OBJECTIVES (TARGETS AND ATTRIBUTES): MARINE MAMMAL SPECIES

- 10.21.3.1. 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 document⁸³;
 - Grey seal: Pembrokeshire Marine SAC document⁸⁴ and the SACOs page of Natural England's Designated Sites View website for the Humber SAC⁸⁵; and
 - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC⁸⁶.
- 10.21.3.2. Table 10.50 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.

⁸³ http://jncc.defra.gov.uk/pdf/SNorthSea_ConsAdvice.pdf

⁸⁴ https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929024980000000

⁸⁵ <u>https://designatedsites.naturalengland.org.uk/</u>

⁸⁶ <u>https://designatedsites.naturalengland.org.uk/</u>



Table 10.50 - SACO attributes sci	reened in for assessment
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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

10.21.3.3. 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

10.21.4. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS ON SITE INTEGRITY

- 10.21.4.1. For those designated features where LSE could not be excluded, an assessment of potential adverse effects on site integrity is presented in Table 10.51 and Table 10.52 below.
- 10.21.4.2. It should be noted that proxy targets have not been used because targets are sitespecific.
- 10.21.4.3. It is concluded that there will be no adverse effects on site integrity for the Estuaire de la Seine SAC / Marais Vernier Ramsar from either the Proposed Development alone or the Proposed Development in combination with other plans or projects.

Table 10.51 - Assessment of potential adverse effects on site integrity for Annex II fish species of the Estuaire de la Seine SAC/Marais Vernier Ramsar 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 development phases. Spills have th shad during their spawning migratic
			Population: juvenile densities	N/A	However, routine mitigation measu 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 <u>occurringand</u> therefore will not resu from the Proposed Development al
	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.
Salmon	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
			Population: juvenile densities	N/A	their sensitivity to pollution and pref However, routine mitigation measu
	The structure and function of the habitats of qualifying species		Supporting habitat: biological connectivity	N/A	of waste management, pollution pre and strict navigational protocols wil therefore will not result in adverse e Proposed Development alone.
	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 th river lamprey and transformers duri migrations given their sensitivity to
	Population: Juvenile densities		Population: Juvenile densities	N/A	



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 prevent these events occurring and sult in adverse effects on site integrity 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 reference for surface waters.

sures of standard best practice in terms prevention measures (Section 10.2.5) vill prevent these events occurring and effects on site integrity from the

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.

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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	However, routine mitigation measu of waste management, pollution pro and strict navigational protocols wil occurringand therefore will not resu
	li li	Supporting habitats: Integrity of off-site habitats	N/A	from the Proposed Development al 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 th
			Population: Juvenile densities	N/A	sea lamprey and transformers durin migrations given their sensitivity to
The structure and function of the habitats of qualifying species		Supporting habitat: Biological connectivity	N/A	However, routine mitigation measured of waste management, pollution preasured and strict navigational protocols will occurring and therefore will not resured the strict management.	
			Structure and function: Supporting	N/A	from the Proposed Development al
		off-site habitat		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 adverse effect on site integrity can be concluded for the Estuaire de la Seine ZSC/Marais Vernier Ramsar arising from either the Proposed Development alone, or in combination with other plans or projects.



sures of standard best practice in terms prevention measures (Section 10.2.5) vill prevent these events occurring and sult in adverse effects on site integrity 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 prevent these events occurring and sult in adverse effects on site integrity 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 10.52 - Assessment of potential adverse effects on site integrity for the Estuaire de la Seine SAC 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	Pollution	NA	NA	Mitigation included in the dML requires that the best pr preventing pollution events are followed during delivery
Grey seal	natural habitats and habitats of the qualifying species; The structure and function (including typical species) of qualifying natural	ts and habitats of the Pollution Supporting process water quality - contaminants	water quality -	NA	10.2.5). In the unlikely event of pollution events occu procedures and responsibilities for effectively manag Similar best practice measures are employed for the could contribute to in combination effects.
Harbour seal	habitats; The structure and function of the habitats of the qualifying species;	Pollution Supporting processes: water quality - contaminants	NA	Therefore, it is concluded that adhering to mitigation r no adverse effects on site integrity, either alone or in projects.	
	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 adverse effect on site integrity can be concluded for the Estuaire de la Seine SAC 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

measures will ensure that there will be combination with other plans or

WSP/Natural Power



10.22. MARINE: 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 document⁸⁷;
 - Grey seal: Pembrokeshire Marine SAC document⁸⁸ and the SACOs page of Natural England's Designated Sites View website for the Humber SAC⁸⁹; and
 - Harbour seal: SACOs page of Natural England's Designated Sites View website for The Wash and North Norfolk Coast SAC⁹⁰.
- 10.22.2.2. Table 10.53 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.

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 10.53 - SACO attributes screened in for assessment

10.22.2.3. The following non-equivalent attributes listed within the SACOs were screened out from further assessment:

⁸⁷ <u>http://jncc.defra.gov.uk/pdf/SNorthSea_ConsAdvice.pdf</u>

⁸⁸ https://cdn.naturalresources.wales/media/687999/eng-pembrokeshire-marine-reg-37-report-

^{2018.}pdf?mode=pad&rnd=131929024980000000

⁸⁹ https://designatedsites.naturalengland.org.uk/

⁹⁰ 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 10.54 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 10.54 - Assessment of potential adverse effects on site integrity for the Récifs Gris-Nez Blanc-Nez SAC 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 preventing pollution events are followed during deliv
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 r Similar best practice measures are employed for the ot could contribute to in combination effects.
Harbour seal	habitats; The structure and function of the habitats of the qualifying species;	Pollution	Supporting processes: water quality - contaminants	NA	Therefore, it is concluded that adhering to mitigation monopole adverse effects on site integrity, either alone or in concepts.
	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 adverse effect on site integrity can be concluded for the Récifs Gris-Nez Blanc-Nez SAC 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

measures will ensure that there will be combination with other plans and

WSP/Natural Power



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Modified Document	6.8.1 HRA - Vol 1 - Habitats Regulations Assessment Report Main Text Rev003.docx	

Comparison Statistics	
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