

The Great Grid Upgrade

Sea Link

Sea Link

Volume 9: Examination Submissions

Document 9.126: Areas of Safeguarded Water Depth - Consideration of Additional Installation Requirements

Planning Inspectorate Reference: EN20026

**Version: A
March 2026**

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1. Introduction

1.1 Background

1.1.1 Engagement with key shipping and navigation stakeholders has identified a requirement for the Proposed Project to commit to safeguarding water depths in specific locations identified as being of critical importance to present and future shipping and navigation activities along the Sea Link cable route.

1.1.2 Three Areas of Safeguarded Water Depth have been identified by Port of London Authority (PLA) in agreement with other key port stakeholders, as areas where specific water depth must be preserved along the Sea Link offshore cable route. The Areas of Safeguarded Water Depth are shown in Plate 1.1 and include:

- “Sunk Pilot Boarding Area” to a level of 22 metres below Chart Datum (CD), and
- “Long Sand Head Two-Way Route Crossing” to a level of 12.5 metres below CD, and
- “North East Spit Area” to a level of 12.5 metres below CD,
- and in each case allowance shall be made for an ‘over-dredge’ tolerance of 0.5 metres in addition to the stated depths attributable to standard dredging methodology.

1.1.3 Further engineering work has been completed as a result of further stakeholder representations, to establish the most appropriate method of installation for achieving the required Safeguarded Water Depths in the three areas. This includes a requirement for some additional pre-sweeping in the Sunk Pilot Boarding Area to ensure that the bundled cables can be installed to the required depth of lowering and preserve water depths to a level of 22.5m below CD, and at the NE Spit area to preserve water depths to a level of 13.0 m below CD. The additional installation requirements, including the requirements have been informed by the following documents:

- **Application Document 9.96 Water Depth Baseline Study – Shipping and Navigation Technical Note [REP4-093].**
- **Application Document 9.92 Outline Cable Specification and Installation Plan [REP4-090].**

1.2 Purpose of this Document

1.2.1 The requirement for additional installation options is a direct consequence of the need to safeguard water depths in the Sunk Pilot Boarding Area and the NE Spit area which has emerged during the examination process [**REP1-155** and **REP1-156**].

1.2.2 This technical note has been prepared to provide the Examining Authority and other key stakeholders with information and assessment of additional pre-sweeping requirements in the Sunk Pilot Boarding area and the use of additional cable burial techniques within the NE Spit area.

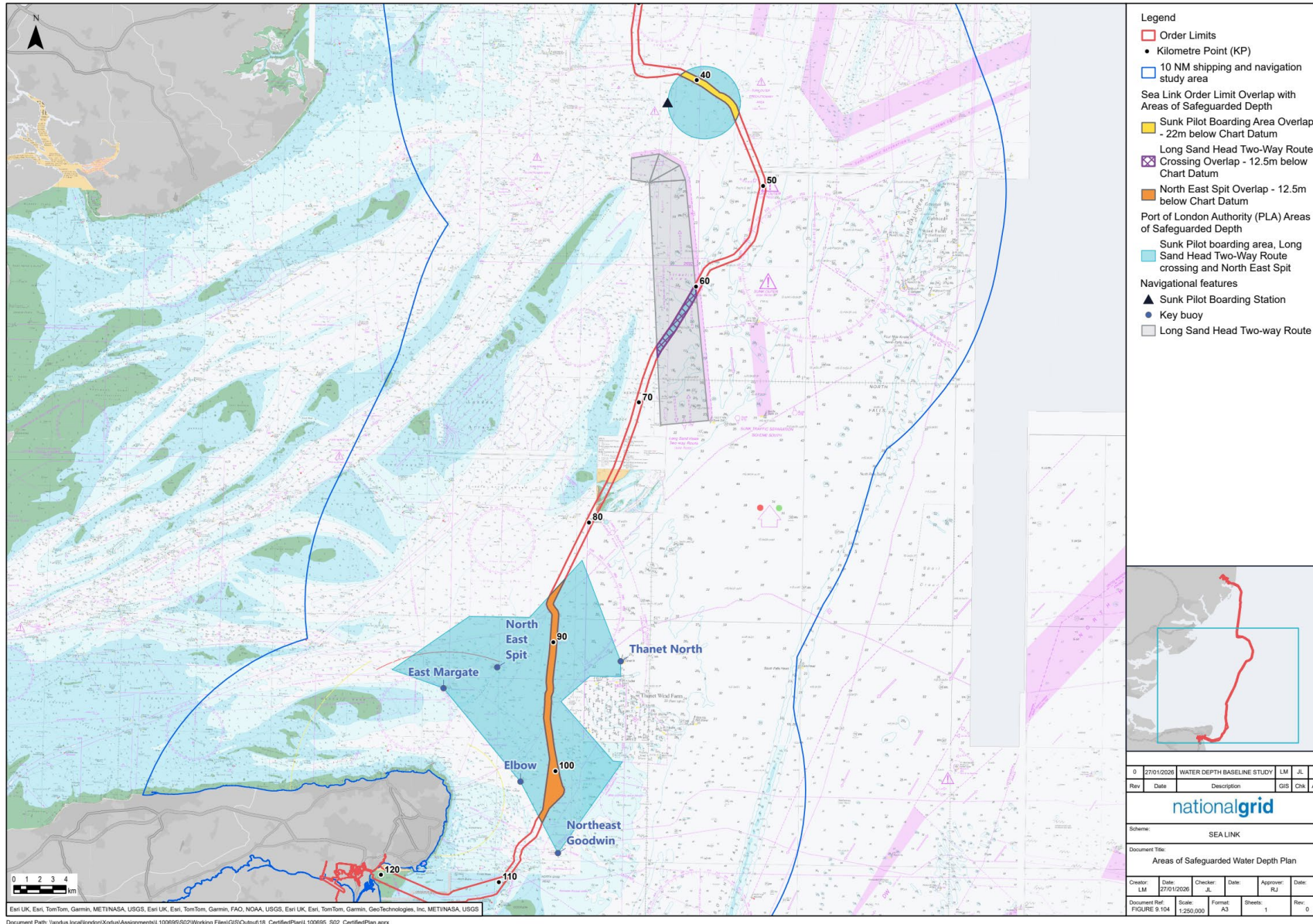


Plate 1.1 Areas of Safeguarded Water Depth

2. Additional Construction Requirements

2.1 Pre-Sweeping Sunk Pilot Boarding Area

- 2.1.1 As set out in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project [REP1A-003]** paragraphs 4.6.210 and 4.6.211 pre-sweeping may be performed using a variety of tools including dredgers, Mass Flow Excavator (MFE) or controlled flow excavators (CFEs) and Trailing Suction Hopper Dredge (or equivalent).
- 2.1.2 A summary of the parameters for pre-sweeping that have been assessed in the application, and proposed changes to those parameters to include the additional pre-sweeping in the Sunk Pilot Boarding area are provided in Table 2.1 below.

Table 2.1 Pre-sweeping parameters

Assessed Application Parameters (as per Table 4.13 in [REP1A-003])	Additional Installation Requirements
<u>KP96.32 to KP113.883</u> Width: Swathe of 10 m –20 m. Length: 17.563 km. Area: 351,300 m ² Average depth of material to be removed: 2 m Volume of material – approximately 250,000 m ³	<u>KP38.7 to KP44.4</u> Width: Swathe of 20-30 m Length: up to 2 km Area: 60,000 m ² Average depth of material to be removed: 1.5 m Volume of material - approximately 75,000 m ³

As this is sediment disturbance during construction of ~~limited material volumes~~, there is no designated disposal area. The material would be re-distributed within the pre-swept area of Order Limits in such a way that the local currents would not backfill the pre-swept area prior to cable installation and protection. The mechanism to infill the rock trench and allow the seabed to revert to natural bedforms is by natural backfill and sediment circulation / deposition.

2.2 Additional Trenching Tools NE Spit Area

- 2.2.1 The Applicant confirms that pre-sweeping activities between KP96.32 to KP113.883 have already been assessed as part of the Proposed Project.
- 2.2.2 As set out in **Application Document 6.2.1.4 Part 1 Introduction Chapter 4 Description of the Proposed Project [REP1A-003]** paragraphs 4.6.225 to 4.6.234 the choice of burial tool would be informed by the findings of the pre-installation surveys

and micro-routing requirements and would be assessed to confirm suitability for the expected seabed sediment conditions prior to award of the installation contract.

- 2.2.3 The current worst case scenario for cable installation across the Offshore Scheme is the use of a displacement plough with a swathe of 25m over a length of up to 122 km.
- 2.2.4 Following further engineering assessments at the NE Spit Area as a result of further stakeholder representations received, the Applicant has identified that the use of a backhoe (deployed from a spud barge) to create a trench is the preferred option between KP 102.4 to KP 104.4 in order to reach the Safeguarded Water Depth required by the ports. The MMO in their response at Deadline 4 **[REP4-126]** have also highlighted their preference to the Applicant to consider deeper burial in is region.
- 2.2.5 A back-hoe dredger is a bucket digger operated from a shallow water barge. It may be self-propelled for positioning on site, or non-self-propelled and relying on the help of workboats. The swathe for this tool is up to 20m. It will maintain position by deploying spud legs within the Order Limits, with a seabed footprint (anchor or spud can) not exceeding 100 m² to excavate the shallow water sediment to provide a trench for the cable to be installed in.
- 2.2.6 With the above in mind, this document assesses the inclusion of backhoe as a trenching tool during construction at the NE Spit Area.

3. Baseline Conditions

3.1 Physical Environment

- 3.1.1 Two surveys campaigns have been completed for the Offshore Scheme, one in 2021 [APP-196] and one in 2024 [APP-197]. Findings from these surveys have been used to inform the Physical Environment impact assessment presented in **Application Document 6.2.4.1 Environmental Statement Part 4 Marine Chapter 1 Physical Environment [REP4-027]**.
- 3.1.2 The first survey which was completed in September 2021 [APP-196] included the acquisition of geophysical and environmental survey data. The geophysical survey data was acquired to determine water depth, surficial geology, seabed features, seabed roughness, shallow geology and objects present along the survey route (offshore scheme corridor). Environmental data acquisition comprised sediment sampling and imagery to establish the existing habitats and faunal communities along the survey route.
- 3.1.1 Additional geophysical and MMO validated environmental survey data was then acquired in 2024 following refinements to the routing of the Offshore Scheme and to collect MMO validated samples in areas of proposed pre-sweeping. The additional survey focused on Areas 1 to 5 illustrated in Plate 3.1. This survey [APP-197] acquired additional data for an area of seabed immediately to the north (west) of the Sunk Pilot Boarding area (Area 3) and Area 4 immediately north of the NE Spit area. This provided additional information for the realignment of sections of the Offshore Scheme Route in these locations.

Surficial Seabed Sediments

- 3.1.2 The Sunk Pilot Boarding area lies mid-way between sample locations S014 and S015 that were sampled during the 2021 survey [APP-196]. The sediment at S014 is predominantly sand (92%) compared to S015 which is muddy sandy gravel (53% sand, 31% gravel, 11% silt and 5% clay).
- 3.1.3 The geophysical data collected during the 2024 survey [APP-197], identified that Area 3 consists predominantly of 'featureless' sandy GRAVEL and muddy sandy GRAVEL with intermittent areas of CHALK, silty SAND and SAND. The dominating gravel sediment type aligns with the 'Circalittoral Coarse Sediment' (A5.14) and '*Mediomastus fragilis*, *Lumbrineris spp.* and venerid bivalves in Circalittoral Coarse Sand or Gravel' (A5.142) habitat classification previously assigned in the 2021 report [APP-196].
- 3.1.1 The NE Spit area (KP 102.4 to KP104.4) corresponds to sample location S021 and as presented in [REP4-027], sediment at this location is classified as muddy sandy gravel.
- 3.1.2 The geophysical data collected during the 2024 survey [APP-197], identified that Area 4 comprises of gravelly SAND defined as 'sandwaves' at the northern and southern extents, whilst 'featureless' sandy GRAVEL interspersed with patches of 'disturbed sediment' defined the central section.
- 3.1.3 The seabed classification over side scan sonar (SSS) data in Areas 3 and 4 are illustrated in Plate 3.1 [APP-197].

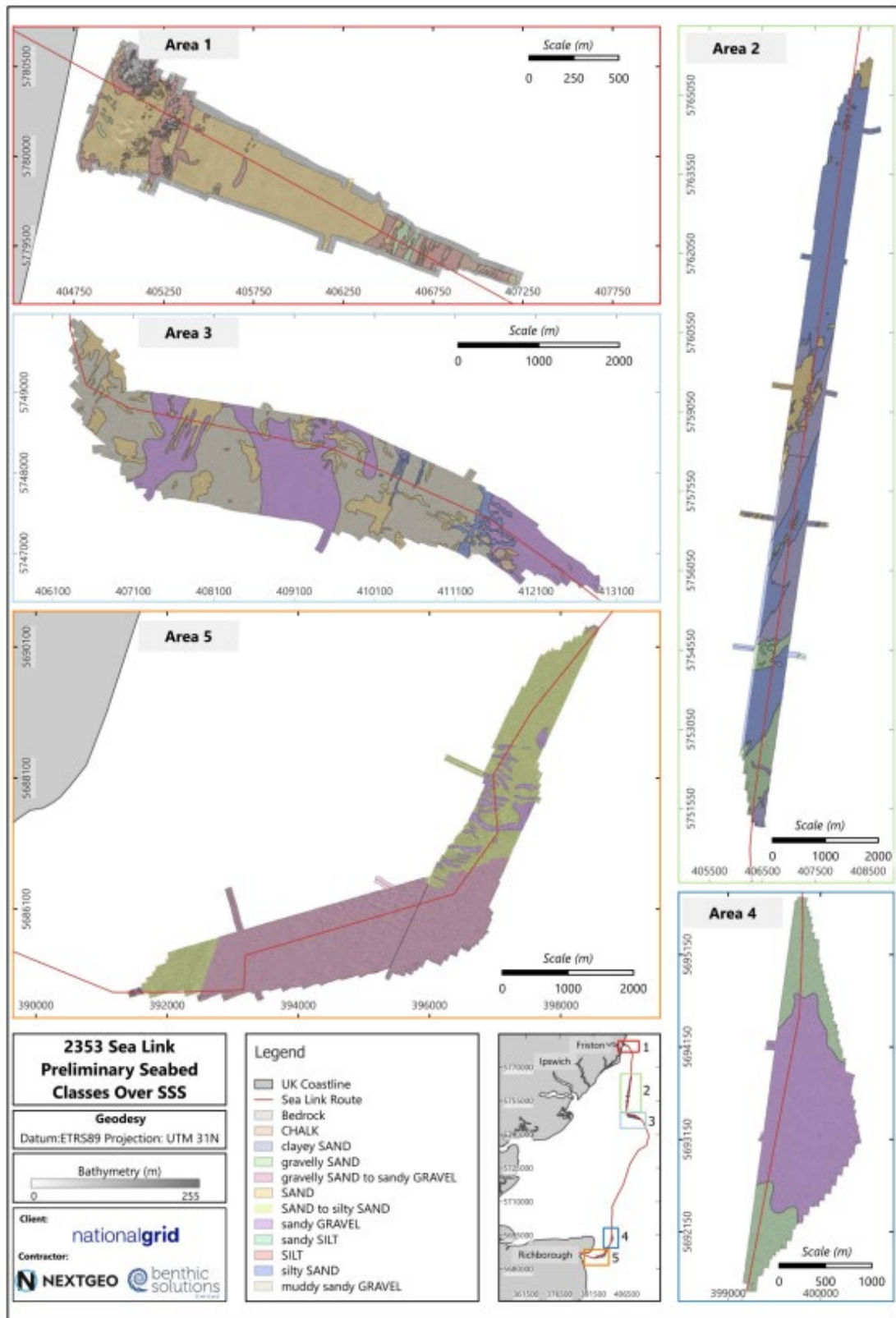


Plate 3.1: Seabed Classification over SSS Data (source: [APP-197])

Contaminants

- 3.1.4 At the Sunk Pilot Boarding area, based on the 2021 survey (**Application Document 6.3.4.2.A ES Appendix 4.2.A Benthic Characterisation Report (Original Report) [APP-196]**), the only metal recorded at concentrations that exceeded threshold values at the two grab sample locations S014 and S015 was arsenic (As). However, thresholds for arsenic were exceeded at all 32 grab sample locations collected during this survey. No other metals were recorded at sample locations S014 or S015 at levels that exceeded threshold values.
- 3.1.5 At the NE Spit area, sample location S021, in addition to exceeding threshold levels of arsenic, threshold values were also reached for mercury. However, overall, the threshold for mercury was reached in eight sample locations and exceeded at 14 sample locations indicating that mercury levels at this location, whilst at threshold values are lower than other locations along the Offshore Scheme. No other metals were recorded at sample location S021 that exceeded threshold values.
- 3.1.6 Organics (Total Organic Carbon (TOC) and organic matter) also varied along the route. Levels of TOC at S014 and S015 were below / at average (0.11% and 0.32%) respectively (average was 0.3%). Levels of organic matter were also below average (0.7% at both locations compared to 1.1% average). Levels of TOC at sample location S021 were also below average (0.14%). However, levels of organic matter at sample location S021 were above average at 2.6%.
- 3.1.7 Total Hydrocarbon Content (THC) varied along the survey route and did not exceed the Dutch RIVM intervention value at any of the grab sample sites. Polycyclic Aromatic Hydrocarbons (PAH) concentrations varied along the survey route. Thresholds for PAHs were exceeded at S014 for one PAH and for four PAHs at S015. However, the total sum of EPA 16 PAHs for both sampling locations was low (12.9 µg/kg at S014 and 61.7 µg/kg at S015) compared to the sum of EPA 16 PAHs further north along the corridor which reached 764.7 µg/kg at S002. Thresholds for PAHs were not exceeded at S021.

3.2 Benthic Ecology

- 3.2.1 Environmental data collected during the 2021 survey (**Application Document 6.3.4.2.A ES Appendix 4.2.A Benthic Characterisation Report (Original Report) [APP-196]**) was acquired specifically to characterise benthic ecological conditions and map the distribution and extent of habitats along the offshore scheme.
- 3.2.2 As set out in **Application Document 6.3.4.2.A ES Appendix 4.2.A Benthic Characterisation Report (Original Report) [APP-196]** and **Application Document 6.2.4.2 Environmental Statement Part 4 Marine Chapter 2 Benthic Ecology [REP4-029]** – Table 2.12 the sediment at S014 (Sunk Pilot Boarding area) comprises of Sand with relatively sparse fauna, including bivalve *K. bidentata* and *Goodallia triangularis*. Substrate and faunal composition indicate the presence of A5.26 - Circalittoral muddy sand. The sediment at S015 (also Sunk Pilot Boarding area) comprises muddy sandy Gravel relatively sparse fauna, including Nematoda, polychaete *Paradoneis lyra*, *M. fragilis*, *L. cingulata* and bivalve *K. bidentata*. Substrate and faunal composition indicate the presence of A5.142 - *Mediomastus fragilis*, *Lumbrineris spp.* and venerid bivalves in circalittoral coarse sand or gravel.
- 3.2.3 Sediment at S021 (NE Spit area) comprises A5.14/ A5.44 Circalittoral coarse sediment/Circalittoral mixed sediment.

- 3.2.4 No habitats of conservation importance were identified at S014. A small patch of *S. spinulosa* was identified at S015 but this was not found to be reef forming. Areas indicative of Annex I habitat subtidal sandbanks (1110) were identified at sample location S021.
- 3.2.5 Neither of the Sunk Pilot Boarding area or NE Spit area are located within any sites designated for the protection of benthic features. The Margate and Long Sands Special Area of Conservation (SAC) lies approximately 3 km south/southwest of the Sunk Pilot Boarding area and the Goodwin Sands MCZ lies approximately 3 km south of the southern end of the NE Spit (**Application Document - 6.4.4.2 Environmental Statement Figures Marine Benthic Ecology [REP1-067]** – Figure 6.4.4.2.1). This site is designated for the protection of the Annex I habitat ‘sandbanks which are slightly covered by sea water all the time’.

3.3 Fish and Shellfish

- 3.3.1 As presented in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology [AS-022]** there are several fish and shellfish species known to be present in the Offshore Scheme study area that are protected under international and national conservation legislation. All species listed are also considered to be of wider ecological value as well as commercial value within the Study Area except for sandeel and the migratory fish species. No designated shellfish water protected areas are located along the Offshore Scheme.
- 3.3.2 It was also concluded in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology [AS-022]** that the offshore scheme is not considered to overlap important spawning grounds for herring and heat map analysis identified the cable route as overlapping predominantly low confidence herring spawning.

3.4 Marine Mammal

- 3.4.1 As presented in **Application Document 6.2.4.4 Environmental Statement Part 4 Marine Chapter 4 Marine Mammals [REP4-031]** among all the cetacean species identified as potentially being present within the Offshore Scheme study area, harbour porpoise is the most abundant and frequently occurring species. Along the east coast of the UK, the highest densities occur in the southern region of the North Sea, part of which (36,951 km²) is covered by the Southern North Sea (SNS) SAC which has been designated specifically for harbour porpoise, protecting key summer and winter habitat for the species. The Offshore Scheme passes through part of the SNS SAC designated for winter habitat for 70 km. This includes the Sunk Pilot Boarding area which is located within the SNS SAC. The NE Spit Area of Safeguarded Water Depth is located outside the SNS SAC.
- 3.4.2 Other commonly occurring species include bottlenose dolphin, minke whale and white-beaked dolphin. Abundance estimates for harbour porpoise and these other commonly occurring species are presented in **Application Document 6.2.4.4 Environmental Statement Part 4 Marine Chapter 4 Marine Mammals [REP4-031]**. Other cetacean species including Atlantic white-sided dolphin, common dolphin, humpback whale, killer whale, long-finned pilot whale and Risso’s dolphin also could occur within the North Sea and therefore could occur along the Offshore Scheme and within both the Sunk Pilot Boarding area and NE Spit area.

- 3.4.3 There is also potential for the presence of pinniped (grey and harbour seals) in the Offshore Scheme study area [REP4-031]. The Wash and Norfolk Coast SAC, located 110 km for the Offshore Scheme, is the closest site designated for harbour seals. There are a few haul-out sites for harbour seal in the Offshore Scheme study area, including at Pegwell Bay and Goodwin Sands along the southern section of the Offshore Scheme and within the wider Greater Thames Estuary area.
- 3.4.4 There are also several haul-out sites for grey seals in the Greater Thames Estuary area, associated with sandbanks of Kentish Knock and Goodwin Sands and sand banks further within the estuary and along the coastline. However, there are no designated sites (SACs) for the protection of grey seals. It is likely that grey and harbour could be present along the Offshore Scheme including in both the Sunk Pilot Boarding area and NE Spit area.

3.5 Marine Ornithology

- 3.5.1 The Offshore Scheme directly passes through six sites that are designated nationally or internationally for the protection of birds (**Application Document 6.4.4.5 Environmental Statement Figures Marine Ornithology [REP4-051]**). These include the Outer Thames Estuary (OTE) Special Protection Area (SPA), Thanet Coast and Sandwich Bay SPA, Thanet Coast and Sandwich Bay Ramsar site, Sandwich and Pegwell Bay National Nature Reserve (NNR), Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest (SSSI), and Leiston-Aldeburgh SSSI. Details of these sites are provided in **Application Document 6.2.4.5 Environmental Statement Part 4 Marine Chapter 5 Marine Ornithology [REP2-003]** - Table 5.9.
- 3.5.2 The OTE SPA covers an area of approximately 3,924 km² along the east coast of England in the southern North Sea. The site extends northward from the Thames Estuary to the sea area off Great Yarmouth on the East Norfolk Coast. The OTE SPA is designated for the protection of wintering red-throated diver, breeding little terns and breeding common terns. The site supports the largest aggregations of wintering red-throated diver in the UK, 38% of the GB population (JNCC, 2020). Approximately 50% of the Offshore Scheme passes through the OTE SPA (56 km).
- 3.5.3 Common and little tern features of the OTE SPA may also be present along the Offshore Scheme (**Application Document 6.2.4.5 Environmental Statement Part 4 Marine Chapter 5 Marine Ornithology [REP2-003]**) although as with red-throated diver, densities of both species in the vicinity of the Sunk Pilot Boarding area and NE Spit area are expected to be low due to the high levels of vessel traffic movements in these areas.
- 3.5.1 Both the Sunk Pilot Boarding area and NE Spit area are located outside the boundaries of the OTE SPA.
- 3.5.2 In addition to features of the OTE SPA, there is also potential for breeding seabirds associated with other designated sites in the area such as the Alde-Ore Estuary SPA, Alde-Ore Estuary SSSI, Thanet Coast and Sandwich Bay SPA and Ramsar, Minsmere-Walberswick Ramsar and Sandwich Bay to Hacklinge Marshes SSSI to be present in the study area and along the Offshore Scheme. These include breeding gull species (lesser black-backed gull, herring gull, Mediterranean gull and common gull) and tern species (little tern, common tern, sandwich tern and Arctic tern).

3.6 Marine Archaeology

- 3.6.1 The marine archaeology baseline as presented in **Application Document 6.2.4.6 Environmental Statement Part 4 Marine Chapter 6 Marine Archaeology [REP4-033]** was informed by various data sources. These included a review of relevant marine archaeological records data including UKHO data for charted wrecks and obstructions, and the National Marine Heritage Record (NMHR)) and an analysis of geophysical survey data acquired from the 2021 and 2024 surveys.
- 3.6.2 No current maritime or aviation sites within the study area were identified as having statutory protection.
- 3.6.3 Anomalies identified along the section of the Offshore Scheme that corresponds to the Sunk Pilot Boarding area and NE Spit area are presented in **Application Document 6.4.4.6 Environmental Statement Figures Marine Archaeology [REP4-052]**.
- 3.6.4 Of the anomalies identified in the vicinity of the PLA Sunk Pilot Boarding Area of Safeguarded Water Depth, none are classified as A1 – Anthropogenic origin of archaeological interest. A few anomalies are identified as A2_h (Anomaly of likely anthropogenic origin but of unknown date; maybe of archaeological interest or a modern feature). This includes a small cluster of A2_h anomalies at the northern end Sunk Pilot Boarding area. Several A2_l anomalies (anomalies of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature) have also been identified in the Sunk Pilot Boarding area.
- 3.6.5 In comparison, two A1 features (anthropogenic origin of archaeological interest) were identified in the vicinity of the NE Spit area. These include ID7487 which is a magnetic anomaly and ID7494, a wreck. Both have been identified as requiring a 50 m recommended Archaeological Exclusion Zone (AEZ).

3.7 Commercial Fisheries

- 3.7.1 As set out in **Application Document 6.2.4.8 Part 4 Marine Chapter 8 Commercial Fisheries [REP1A-009]** and illustrated in **Application Document 6.4.4.8 ES Figures Marine Commercial Fisheries [APP-285]** the Offshore Scheme is located within the following ICES Rectangles:
- ICES rectangle 31F1 – encompasses the southern section of the Offshore Scheme (34%), including the southern landfall at Pegwell Bay.
 - ICES rectangle 32F1 – encompasses the middle portion of the Offshore Scheme (50%); and
 - ICES rectangle 33F1 – encompasses the northern section of the Offshore Scheme (16%) including the northern landfall between Thorpeness and Aldeburgh.
- 3.7.2 The PLA Sunk Pilot Boarding area lies within ICES rectangle 32F1 and the NE Spit area is located in ICES rectangle 31F1.
- 3.7.3 As illustrated in **Application Document 6.4.4.8 (B) ES Figures Marine Commercial Fisheries – Figure 6.4.4.8.4 Surveillance Sightings Data (2013 – 2022)** sightings of fishing vessels in the Sunk Pilot Boarding area are limited. This is potentially reflective of the existing high levels of non-fishing vessel traffic that pass through the area limiting the potential for fishing to take place in this specific location. However, there is evidence of higher levels of fishing activity in the vicinity of the NE Spit area, in particular gill netters and whelker/potters towards the southern end of the area which is within the 6 nm limit.

3.8 Shipping and Navigation

- 3.8.1 As set out in **Application Document 6.2.4.7 Environmental Statement Part 4 Marine Chapter 7 Shipping and Navigation [REP4-035]** the Sunk is a 'deep' (a small area of exceptional depth) which forms a common access to Harwich Haven and the Thames Estuary (Figure 6.4.4.7.A.2 Ports and Navigation in **Application Document 6.4.4.7.A Environmental Statement Figures Marine Navigational Risk Assessment Part 1 of 2 [REP1-069]**).
- 3.8.2 It is an extremely busy area for shipping, and therefore two Precautionary Areas (International Maritime Organisation (IMO) designated areas where ships must navigate with particular caution) and a number of Traffic Separation Schemes (TSS) have been established across this region to control traffic and reduce the risk of collisions (UKHO, 2020).
- 3.8.3 The Sunk Vessel Traffic Service (VTS) covers the two Sunk Precautionary Areas (Inner and Outer), as well as the associated TSSs and approach routes (Figure 6.4.4.7.A.2 Ports and Navigation in **Application Document 6.4.4.7.A Environmental Statement Figures Marine Navigational Risk Assessment Part 1 of 2 [REP1-069]**). Within the VTS area, all vessels of 300 gross tonnage (gt) and over are required to comply with the VTS rules.
- 3.8.4 The Offshore Scheme Boundary runs through five IMO routing measures areas, all associated with the Sunk:
- Sunk Inner Precautionary Area (KP 35-38);
 - Sunk Outer Precautionary Area (KP 38-59);
 - Sunk Area to be Avoided (KP 45-47);
 - Sunk Traffic Separation Zone (KP 59.5-60); and
 - Long Sand Head Two-way Route (KP 60-66).
- 3.8.5 In addition to this, there are multiple further IMO Routing Measures within the Study Area, associated either with Sunk, Northern Approaches to the Thames Estuary or Long Sand Head, as well as The Strait of Dover and Adjacent Waters TSS and an "Area to be Avoided" for the Dover Straits in the southern portion of the Study Area (Figure 6.4.4.7.A.2 Ports and Navigation in **Application Document 6.4.4.7.A Environmental Statement Figures Marine Navigational Risk Assessment Part 1 of 2 [REP1-069]**).
- 3.8.6 The NE Spit area corresponds to waters around the NE Spit pilot station which is located 3.9 km to the west of the Offshore Scheme at KP97. The approaches to the Port of London surrounding the NE spit buoy were identified in **Application Document 6.2.4.7 Environmental Statement Part 4 Marine Chapter 7 Shipping and Navigation [REP4-035]** and **Application Document 6.3.4.7.A Environmental Statement Appendix 4.7.A Navigational Risk Assessment [REP4-048]** as being of particular importance and focus with regard to under-keel clearance.

4. Impact Assessment

4.1 Physical Environment

4.1.1 The following assessment is informed by information presented in **Application Document 6.2.4.1 Environmental Statement Part 4 Marine Chapter 1 Physical Environment [REP4-027]** and **Application Document 6.3.4.1.A ES Appendix 4.1.A Suspended Sediment Modelling [APP-195]**.

Changes to Seabed Morphology

4.1.2 As presented in Section 3.2, there are no notable sand waves present in the Sunk Pilot Boarding area. Smaller areas of ‘rippled’ seabed were noted across Area 3 **[APP-197]**. Pre-sweeping in this location will therefore not directly impact any sandwave features.

4.1.3 Where smaller bedforms are present (megaripples and ripples), these will recover and reinstate themselves quickly following cable installation (over minutes, days and months (Slinn, 2006)), due to the smaller volumes of sediment needed for their formation and the associated faster migration rates.

4.1.4 The sensitivity of the seabed bedforms along the Offshore Scheme were assessed to have a medium sensitivity based on the short to long-term timescales over which bedforms may recover following sand wave lowering. In the Sunk Pilot Boarding area, due to the absence of any sandwave features, the sensitivity is reduced to low. Due to limited extent and volume of sediment, the magnitude of the impact of pre-sweeping on the seabed bedforms in this specific location is considered to be minor. This will result in a **minor** effect that is **not significant**.

4.1.5 For the introduction of a backhoe dredger technique at the NE Spit area, the footprint of this method is considered to be within the Maximum Design Scenario already assessed within **[REP4-027]** for a displacement plough with a disturbance swathe of 25m.

4.1.6 The conclusions of the Physical Environment Chapter **[REP4-027]** therefore have not changed.

Changes to Local Hydrodynamic, Wave and Sediment Transport Processes and Wider Sandbank Receptors

4.1.7 Pre-sweeping has the potential to alter the seafloor morphology, as a result, this will lead to a change in local hydrodynamic, wave and sediment transport patterns. Changes associated with these are ‘pathways’ as opposed to receptors.

4.1.8 Given that there are no sandwave features in the Sunk Pilot Boarding area, pre-sweeping in this location will not impact local or regional sediment transport and hydrodynamic processes due to the removal of any significant seabed bedform features such as sand waves.

4.1.9 Any sediment will either be used to backfill the cable trench (in addition to rock back-fill in these locations) or will be rapidly dispersed and redistributed back into the system through natural sediment transport and hydrodynamic processes, rather than altering the overall form and function of those wider, regional scale processes.

- 4.1.10 Given that sediment transport and hydrodynamic processes function at a regional scale, they have low sensitivity to the removal and redeposition of the pre-swept material. It was concluded that for 250,000 m³ (original assessment) potential effects are minor and therefore not significant. The magnitude of the impacts from pre-sweeping in the Sunk Pilot Boarding area (75,000 m³) is also low and will therefore also be **minor** and **not significant**.
- 4.1.1 For the introduction of a backhoe dredger technique at the NE Spit area, the footprint of this method is considered to be within the Maximum Design Scenario already assessed within [REP4-027] for a displacement plough with a disturbance swathe of 25m.
- 4.1.2 The conclusions of the Physical Environment Chapter [REP4-027] therefore have not changed.

Increased SSC in the Water Column and Sediment Deposition

- 4.1.3 There is potential that, during pre-sweeping in the Sunk Pilot Boarding area, some sediment will be released into the water column and that this could temporarily elevate SSC levels.
- 4.1.4 The seabed sediment in the Sunk Pilot Boarding area is predominantly sandy gravel and muddy sandy gravel with intermittent areas of chalk, silty sand and sand.
- 4.1.5 Where sediment is released into the water column, as a result of disturbance from pre-sweeping activities, it is expected that the coarser sediment fractions (gravels and coarse sands) will fall back to the seabed within the immediate vicinity of disposal location (within 20 m) in the order of seconds to tens of seconds. The finer fractions (including fine sands, silts and clays in the Sunk Pilot Boarding area) may be transported further (up to 17 km) and could remain in suspension for several days/couple of weeks. However, prevailing tides and currents present at the disposal location will naturally disperse the finer particles through the water column, diluting the suspended sediment over a wider area, returning water column turbidity to baseline conditions.
- 4.1.6 Given the limited volumes of sediment, and that the pre-sweeping will be a one-off activity (not continuous) of short duration (days), potential impacts of in terms of SSC levels will be negligible and not significant.
- 4.1.7 Regarding potential accumulations of sediment following redeposition, it is expected that the coarse sediment fractions will be rapidly dispersed and redistributed through natural sediment transport and hydrodynamic processes, limiting the potential for any significant sediment accumulations in the vicinity of pre-sweeping. Any redeposited sediment is also likely to be subject to further disturbance resulting from cable installation activities, further reducing the potential for any long-term increases in sediment accumulation along the Offshore Scheme. Where redeposition of finer fractions occurs, this will be dispersed over a much wider area and will be limited to a thickness of less than 0.5 mm on the seabed, which is considered very small and equivalent to natural variability.
- 4.1.8 Historically, English nearshore and offshore waters have been heavily impacted by anthropogenic activities, such as dredging, which can result in sediment resuspension and the associated release of chemical pollution. Areas of elevated heavy metals have been identified along the Offshore Scheme found to be typical of those found in the wider North Sea region. The concentrations of hydrocarbon and heavy metal encounters along the Offshore Scheme are not considered significant in the context of

contaminants already present within the receiving environment and sensitivity is considered low. There will be a limited spatial extent of pre-sweeping within the Sunk Pilot Boarding area and so limiting the potential to disturb sediments. This, combined with the limited spatial extent of sediments with contaminants exceeding Cefas Action Level 1, along with the dominance of sand across the Offshore Scheme [APP-196], and the potential for suspended sediments to be dispersed and diluted rapidly through natural hydrodynamic processes. The magnitude of the impact is assessed to be Negligible, as it is not expected that the potential disturbance of sediment bound contaminants will significantly affect the water quality.

- 4.1.9 Potential impacts in terms of increased SSC in water column will be **minor/negligible** and **not significant**.
- 4.1.10 For the introduction of a backhoe dredger technique at the NE Spit area, the footprint of this method is considered to be within the Maximum Design Scenario already assessed for a displacement plough with a disturbance swathe of 25m.
- 4.1.11 The conclusions of the Physical Environment Chapter [REP4-027] therefore have not changed.

4.2 Benthic Ecology

- 4.2.1 The following assessment is informed by information presented in **Application Document 6.2.4.2 Environmental Statement Part 4 Marine Chapter 2 Benthic Ecology [REP4-029]** and **Application Document 6.3.4.1.A ES Appendix 4.1.A Suspended Sediment Modelling [APP-195]**.

Temporary Increase in SSC and Sediment Deposition Leading to Increased Turbidity and Smothering Effects and Possible Contaminant Mobilisation

- 4.2.2 The benthic assessment completed for the application [REP4-029] considers the potential effect of increased SSC and sediment deposition from cable installation activities including pre-sweeping and sandwave clearance (250,000 m³). The assessment considers the potential effects of increased SSC and sediment deposition on all subtidal benthic habitats and features that have been identified along the entire Offshore Scheme.
- 4.2.3 The total volume of additional material requiring pre-sweeping is 75,000 m³ in the Sunk Pilot Boarding area (KP38.7 to KP44.4). This is in addition to the 250,000 m³ that has already been assessed [REP4-029] for pre-sweeping (sand wave lowering) activities between KP96.32 to KP113.883.
- 4.2.4 There is potential that, during pre-sweeping in the Sunk Pilot Boarding area, some sediment will be released into the water column and that this could temporarily elevate SSC levels. The seabed sediment in the Sunk Pilot Boarding area is predominantly sandy gravel and muddy sandy gravel with intermittent areas of chalk, silty sand and sand.
- 4.2.5 Where sediment is released into the water column as a result of disturbance from pre-sweeping activities, it is expected that the coarser sediment fractions (gravels and coarse sands) will fall back to the seabed within the immediate vicinity of disposal location (within 20 m) in the order of seconds to tens of seconds. The finer fractions (including fine sands, silts and clays in the Sunk Pilot Boarding Area) may be transported further (up to 17 km) and could remain in suspension for several days/couple of weeks. However, prevailing tides and currents present at the disposal

location will naturally disperse the finer particles through the water column, diluting the suspended sediment over a wider area, returning water column turbidity to baseline conditions.

- 4.2.6 Given the limited volumes of sediment, and that the pre-sweeping will be a one-off activity (not continuous) of short duration (days), the magnitude of impact in terms of SSC levels is not considered to lead to adverse effects in benthic habitats and species. Potential impacts on benthic habitats in terms of SSC levels from additional pre-sweeping will be negligible to minor and not significant.
- 4.2.7 Regarding potential accumulations of sediment following redeposition, it is expected that the coarse sediment fractions will be rapidly dispersed and redistributed through natural sediment transport and hydrodynamic processes, limiting the potential for any significant sediment accumulations in the vicinity of pre-sweeping. Any redeposited sediment is also likely to be subject to further disturbance resulting from cable installation activities, further reducing the potential for any long-term increases in sediment accumulation along the Offshore Scheme. Where redeposition of finer fractions occurs, this will be dispersed over a much wider area and will be limited to a thickness of less than 0.5 mm on the seabed, which is considered very small and equivalent to natural variability.
- 4.2.8 Given the natural dispersion and redistribution of pre-swept sediment through natural sediment transport and hydrodynamic processes, any temporary accumulation of sediment on the seabed in the disposal location will only likely be detectable for short period of time (hours/days) and is not expected to lead to any adverse effect to any benthic features. The potential risk of smothering of sensitive benthic habitats is therefore considered to be low.
- 4.2.9 Given the low to medium sensitivity of benthic receptors to increased SSC and smothering and potential magnitude of low for increased SSC and smothering, the likely effect will be **minor** and **not significant**.
- 4.2.10 In terms of potential contamination, although sediment contaminants could also be mobilised during pre-sweeping, contaminant concentrations within the Sunk Pilot Boarding area were below average compared to other locations along the Offshore Scheme and at levels consistent with general background levels for this region of the North Sea. Therefore, increased SSC and deposition is not anticipated to result in detectable changes in sediment bound contaminants above background levels. Therefore, the overall magnitude of the impact is considered to be **negligible**.

Temporary Seabed Disturbance

- 4.2.11 For the introduction of a pre-sweeping at the Sunk Pilot Boarding area, and backhoe dredger technique at the NE Spit area, the footprint of these methods is considered to be within the Maximum Design Scenario already assessed for a displacement plough with a disturbance swathe of 25m which has been assessed for the entire Offshore Scheme.
- 4.2.12 The conclusions of the Benthic Chapter [REP4-029] therefore have not changed.

4.3 Fish and Shellfish

- 4.3.1 The following assessment is informed by information presented in **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology [AS-022]**.

Temporary Physical Disturbance to Fish and Shellfish Habitat

- 4.3.2 For the introduction of a pre-sweeping at the Sunk Pilot Boarding area, and backhoe dredger technique at the NE Spit area, the footprint of these methods is considered to be within the Maximum Design Scenario already assessed for a displacement plough with a disturbance swathe of 25m which has been assessed for the entire Offshore Scheme.
- 4.3.3 The conclusions of the Fish and Shellfish Chapter [AS-022] therefore have not changed.

Temporary Increase in SSC and Subsequent Sediment Deposition Leading to Contaminant Mobilisation, Increased Turbidity and Smothering Effects on Fish and Shellfish

- 4.3.4 As set out in **Application Document 6.2.4.3 (B) Part 4 Marine Chapter 3 Fish and Shellfish Ecology [AS-022]** seabed disturbance from pre-installation and sediment installation activities have the potential to increase SSC and turbidity, creating a sediment plume in the water column that can travel away from the Offshore Scheme before the sediment is deposited on the seabed. There are several potential effects in fish and shellfish associated with increased SSC and sediment deposition. These include the clogging of respiratory apparatus such as gills, reduced feeding success of visual predators due to decreased visibility, the clogging of feeding apparatus, the mortality of eggs and larvae which are less tolerant to turbid conditions, and effects related to toxic conditions if sediments in suspension are contaminated. The movement and migration of fish could also be impacted by SSC.
- 4.3.5 The largest sediment plumes and highest levels of SSC will be associated with disturbance of sediments with a high proportion of fine particulate material, such as fine sands, muds and clays, that will remain in suspension longest and settle to the seabed more slowly. In comparison, coarser materials such as sand and gravel are expected to settle more quickly within a few hours of disturbance and within only a few tens of metres from the source.
- 4.3.6 The sensitivity of fish species to increased SSC and deposition varies depending on whether they are demersal or pelagic, and their life stage. Most fish species occupying the subtidal and offshore waters along the cable route are pelagic and/or of low sensitivity to SSC. Herring and sandeel eggs are considered to be tolerant to increased SSC, with adaption to natural variability in turbidity. Herring eggs have been shown to continue normal embryonic development in short-term high concentrations of up to 500 mg/l (Kiørboe, 1981).
- 4.3.7 Modelling has been undertaken to estimate the extent of sediment dispersion before deposition as a result of cable installation activities. The method for these calculations, and the results, are reported in further detail in **Application Document 6.2.4.1 Environmental Statement Part 4 Marine Chapter 1 Physical Environment [REP4-027]**.
- 4.3.8 Where sediment is released into the water column as a result of disturbance from pre-sweeping activities, it is expected that the coarser sediment fractions (gravels and coarse sands) will fall back to the seabed within the immediate vicinity of disposal location (within 20 m) in the order of seconds to tens of seconds. The finer fractions (including fine sands, silts and clays) may be transported further (up to 17 km) and could remain in suspension for several days/couple of weeks. However, prevailing tides and currents present at the disposal location will naturally disperse the finer particles

through the water column, diluting the suspended sediment over a wider area, returning water column turbidity to baseline conditions.

- 4.3.9 Regarding potential accumulations of sediment following redeposition, it is expected that the coarse sediment fractions will be rapidly dispersed and redistributed through natural sediment transport and hydrodynamic processes, limiting the potential for any significant sediment accumulations in the vicinity of pre-sweeping at the Sunk Pilot Boarding area. Any redeposited sediment is also likely to be subject to further disturbance resulting from cable installation activities, further reducing the potential for any long-term increases in sediment accumulation along the Offshore Scheme. Where redeposition of finer fractions occurs, this will be dispersed over a much wider area and will be limited to a thickness of less than 0.5 mm on the seabed, which is considered very small and equivalent to natural variability.
- 4.3.10 Given the Offshore Scheme is not considered to be of importance for herring spawning and are considered to have a degree of tolerance to sediment deposition, herring spawning grounds are considered to be of low sensitivity to increased SSC and sediment deposition. Although both additional areas of pre-sweeping on the edge of potential areas of sandeel spawning and that sandeels are of high conservation importance, given they spend a large proportion of time buried in the sand, they are considered to be of only medium sensitivity to smothering.
- 4.3.11 Given the limited volumes of sediment and that the pre-sweeping will be a one-off activity (not continuous) of short duration (days), the magnitude of impact in terms of increased SSC and sediment deposition is negligible. Potential impacts on herring and spawning of in terms of increased SSC levels and sediment deposition from additional pre-sweeping will be **minor** and **not significant**.
- 4.3.12 Shellfish have limited motility compared to other fish species and, as such have increased sensitivity to increased SSC and smothering. However, given the highly localised, short term, temporary nature of the additional pre-sweeping activities, that any increased SSC will rapidly disperse through natural current action and the accumulation of fine fractions of sediment will be within natural levels. Potential effects on shellfish will be negligible and not significant. Potential effects on other marine fish will also be **negligible** and **not significant**.

Underwater Sound

- 4.3.13 Underwater sound for pre-sweeping activities is already included within the Fish and Shellfish assessment **[AS-022]**. For the introduction of a backhoe dredger technique at the NE Spit area, underwater sound generated through this method is considered to also be within the Maximum Design Scenario already assessed.
- 4.3.14 The conclusions of the Fish and Shellfish Chapter **[AS-022]** therefore have not changed.

4.4 Marine Mammals

- 4.4.1 The following assessment is informed by information presented in **Application Document 6.2.4.4 Environmental Statement Part 4 Marine Chapter 4 Marine Mammals [REP4-031]**.

Underwater Sound

- 4.4.2 Pre-sweeping has been assessed in **Application Document 6.2.4.4 Environmental Statement Part 4 Marine Chapter 4 Marine Mammals [REP4-031]** as a potential source of underwater noise that could affect marine mammals that could be present along the Offshore Scheme.
- 4.4.3 Although the pre-sweeping required in the Sunk Pilot Boarding area is additional to the pre-sweeping assessed in **Application Document 6.2.4.4 Environmental Statement Part 4 Marine Chapter 4 Marine Mammals [REP4-031]**, the potential effects of pre-sweeping activities on marine mammals that are likely to be present along the Offshore Scheme are not expected to change other than a slight increase in the duration (days) over which the marine mammals are exposed to noise from pre-sweeping activities. For this reason, a detailed assessment of underwater noise has not been reproduced for this Technical Note.
- 4.4.4 The additional pre-sweeping in the Sunk Pilot Boarding area, although it is located within the SNS SAC, given that this is an existing area of high vessel traffic (hence the need for the pre-sweeping), there is potential that the presence of marine mammals (all species) in this specific location, could potentially be lower than elsewhere along the Offshore Scheme.
- 4.4.5 Therefore, although harbour porpoise, grey and harbour seals are considered to be highly sensitive to underwater sound, given that all species of marine mammal may already be subject to existing levels of disturbance from high levels of vessel traffic passing through the Sunk Pilot Boarding area, and that the additional pre-sweeping will be temporary, of short duration (days) and localised nature (up to 2 km), potential effects will be **negligible** and **not significant**.
- 4.4.6 For the introduction of a backhoe dredger technique at the NE Spit area, underwater sound generated through this method is considered to be within the Maximum Design Scenario already assessed.
- 4.4.7 The conclusions of the Marine Mammal Chapter **[REP4-031]** therefore have not changed.

Potential Effects on Supporting Habitat and Prey Species

- 4.4.8 As discussed within Section 4.1 and 4.2, potential effects of additional pre-sweeping on the physical environment and benthic habitats are considered to be minor and not significant. Therefore, although the Sunk Pilot Boarding area is located within the SNS SAC, any potential effects on supporting habitat within this site due to increased SSC or smothering will be **minor** and **not significant**.
- 4.4.9 As presented in **Application Document 6.2.4.4 Environmental Statement Part 4 Marine Chapter 4 Marine Mammals [REP4-031]** and **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology [AS-022]** there is also potential increased SSC and smothering and underwater sound from cable installation activities including pre-sweeping to also disturb marine mammal prey species (fish and shellfish). Harbour porpoise forage mainly for sandeel, whilst both harbour and grey seals in the southern North Sea forage principally for benthic fish.
- 4.4.10 However, given the highly localised nature of the additional pre-sweeping (up to 2 km), the short term duration of the activities, the low potential for increased SSC and sediment deposition (smothering) of fish and shellfish and the wide ranging nature of marine mammal foraging trips, it is highly unlikely that the additional pre-sweeping

would have any impact on prey species and the availability of prey for all marine mammal species that could be present along the Offshore Scheme.

- 4.4.11 For the introduction of a backhoe dredger technique at the NE Spit area, the footprint of this method is considered to be within the Maximum Design Scenario already assessed for a displacement plough with a disturbance swathe of 25m which has been assessed across the entire Offshore Scheme.
- 4.4.12 The conclusions of the Marine Mammal Chapter **[REP4-031]** therefore have not changed.

Visual Disturbance

- 4.4.13 For the introduction of a backhoe dredger technique at the NE Spit area, visual disturbance from this method is considered to be within the Maximum Design Scenario already assessed within **Application Document 6.2.4.4 Environmental Statement Part 4 Marine Chapter 4 Marine Mammals [REP4-031]**.
- 4.4.14 The conclusions of the Marine Mammal Chapter **[REP4-031]** therefore have not changed.

4.5 Marine Ornithology

- 4.5.1 The following assessment is informed by information presented in **Application Document 6.2.4.5 Environmental Statement Part 4 Marine Chapter 5 Marine Ornithology [REP2-003]**.

Disturbance and Displacement of Birds

- 4.5.2 As set out in **Application Document 6.2.4.5 Environmental Statement Part 4 Marine Chapter 5 Marine Ornithology [REP2-003]** during construction of the Proposed Project, there is the potential for the disturbance and displacement of birds due to the presence of a small number of vessels and barges potentially generating sound and visual impacts.
- 4.5.3 The Sunk Pilot Boarding area lies outside the boundaries of the OTE SPA (> 2km). Due to the existing high levels of vessel traffic in the Sunk Pilot Boarding area, densities of key sensitive marine species (red throated diver and terns) are expected to be lower than elsewhere along the Offshore Scheme.
- 4.5.4 Taking into account the limited duration of the pre-sweeping activities in the Sunk Pilot Boarding area, the low number of vessels, the very slow moving nature of the vessels while pre-sweeping is being completed, existing high levels of vessel traffic in the Sunk Pilot Boarding area and its position outside the OTE SPA, it can be concluded that, potential effects of disturbance and displacement from vessels will be **negligible and not significant**.
- 4.5.5 For the introduction of a backhoe dredger technique at the NE Spit area, disturbance from this method is considered to be within the Maximum Design Scenario already assessed.
- 4.5.6 The conclusions of the Marine Ornithology Chapter **[REP2-003]** therefore have not changed.

Potential Effects on Supporting Habitat and Prey Species

- 4.5.7 As presented in Sections 4.2 and 4.3 potential effects of additional pre-sweeping on the physical environment and benthic habitats as a result of seabed disturbance, increased SSC and sediment deposition are considered to be minor and not significant.
- 4.5.8 **Application Document 6.2.4.5 Environmental Statement Part 4 Marine Chapter 5 Marine Ornithology [REP2-003]** concludes there is also potential increased SSC and smothering and underwater sound from cable installation activities including pre-sweeping to disturb seabird prey species (fish and shellfish). Red-throated diver is considered to feed on small fish and invertebrates whereas herring and sandeel are considered particularly important prey for other seabird species. Although **Application Document 6.2.4.3 Part 4 Marine Chapter 3 Fish and Shellfish Ecology [AS-022]** concluded that effects to fish and shellfish habitat are expected to be negligible and highly localised, direct loss of sandeel or herring spawning habitat or smothering could have an adverse effect on these key prey species.
- 4.5.9 However, given the highly localised nature of the additional pre-sweeping at the Sunk Pilot Boarding area (up to 2 km), the low volume of sediment, and that herring and sandeel spawning grounds are widespread across a large proportion of the North Sea, potential effects on herring and sandeel as prey species as expected to remain as assessed, **negligible and not significant**.
- 4.5.10 For the introduction of a backhoe dredger technique at the NE Spit area, the footprint of this method is considered to be within the Maximum Design Scenario already assessed for a displacement plough with a disturbance swathe of 25m.
- 4.5.11 The conclusions of the Marine Ornithology Chapter **[REP2-003]** therefore have not changed.

4.6 Marine Archaeology

- 4.6.1 For pre-sweeping activities proposed at the Sunk Pilot Boarding area, this would be undertaken over the same area currently assessed within **Application Document 6.2.4.6 Environmental Statement Part 4 Marine Chapter 6 Marine Archaeology [REP4-033]** for cable trenching, lay and burial. With the implementation of appropriate mitigation, as outlined in Section 6.8 and Section 6.10 in **[REP4-033]**, the magnitude would be reduced to small, leading to a residual effect that is **minor adverse**, which is considered to be **not significant**. Mitigation measures include namely Archaeological Exclusion Zones (AEZs) and micro-siting around receptors.
- 4.6.2 For the introduction of a backhoe dredger technique at the NE Spit area, the footprint of this method is considered to be within the Maximum Design Scenario already assessed for a displacement plough with a disturbance swathe of 25m assessed across the entire Offshore Scheme.
- 4.6.3 The conclusions of the Marine Archaeology Chapter **[REP4-033]** therefore have not changed.

4.7 Commercial Fisheries

- 4.7.1 The introduction of pre-sweeping at the Sunk Pilot Boarding area and the backhoe dredger technique at the NE Spit area, is considered to be within the Maximum Design

Scenario already assessed within **Application Document 6.2.4.8 Part 4 Marine Chapter 8 Commercial Fisheries [REP1A-009]**.

- 4.7.2 The conclusions of the Commercial Fisheries Chapter **[REP1A-009]** therefore have not changed.

4.8 Shipping and Navigation

- 4.8.1 The introduction of pre-sweeping at the Sunk Pilot Boarding area and the backhoe dredger technique at the NE Spit area, is considered to be within the Maximum Design Scenario already assessed within **Application Document 6.2.4.7 Environmental Statement Part 4 Marine Chapter 7 Shipping and Navigation [REP4-035]**.

- 4.8.2 The conclusions of the Shipping and Navigation Chapter **[REP4-035]** therefore have not changed.

4.9 Other Sea Users

- 4.9.1 The introduction of pre-sweeping at the Sunk Pilot Boarding area and the backhoe dredger technique at the NE Spit area, is considered to be within the Maximum Design Scenario already assessed within **Application Document 6.2.4.9 Environmental Statement Part 4 Marine Chapter 9 Other Sea Users [REP1-061]**

- 4.9.2 The conclusions of the Other Sea Users Chapter **[REP1-061]** therefore have not changed.

5. Post Consent Condition

5.1 Draft Deemed Marine Licence

- 5.1.1 The Applicant confirms that it has included the following Condition within the dML submitted at Deadline 5:
- 5.1.2 *Unless otherwise agreed with the MMO, a sediment sampling plan request must be submitted and the results submitted for analysis to the MMO prior to any pre-sweeping works at the Sunk Pilot Boarding area Area of Interest and the sediment sampling and analysis must be completed by a laboratory validated by the MMO.*
- 5.1.3 The inclusion of this Condition is to ensure that the correct validated data is sampled and assessed for contamination in accordance with MMO sediment sample analysis requirements in support of marine licence applications.

References

- JNCC. (2020, December). *Outer Thames Estuary SPA*. Retrieved from jncc.gov.uk:
<https://jncc.gov.uk/our-work/outer-thames-estuary-spa/>
- Kjørboe, T. F. (1981). Effects of suspended sediment on development and hatching of herring (*Clupea harengus*) eggs. *Estuarine, Coastal and Shelf Science*, 13(1), 107-111.
- Slinn. (2006). *Sand Ripple Dynamics on the Inner Shelf*.

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