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Revision 02

Company Document

HPC DISPOSAL OF DREDGED MATERIAL TO PORTISHEAD DISPOSAL SITE (LU070) (L/2013/00178 REV6) – NON-TECHNICAL SUMMARY

NOT PROTECTIVELY MARKED

HPC COMPANY DOCUMENT

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EDF Energy

Marine Management Organisation

Disposal Marine Licence Application: Portishead

Environmental Impact Assessment
Volume 1: Non-Technical Summary



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This Environmental Statement, and the Environmental Impact Assessment (EIA) work that was carried out to identify the significant environmental effects of the proposed works, was undertaken in line with the EIA Quality Mark Commitments. The EIA Quality Mark is a voluntary scheme, operated by IEMA, through which EIA activity is independently reviewed, on an annual basis, to ensure it delivers excellence in the following areas: EIA management; EIA team capabilities; EIA regulatory compliance; EIA context and influence; EIA content; EIA presentation; and improving EIA practice.



Document revisions

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1. Introduction

1.1 Introduction

- 1.1.1 Wood Group UK Limited (hereafter referred to as 'Wood') has been commissioned by the applicant, NNB Generation Company (HPC) Limited (NNB GenCo is part of EDF Energy), to support the sixth variation to the existing Marine Licence (licence number: L/2013/00178). The sixth licence variation is related to proposed changes in design and construction methodology for the offshore works at the Hinkley Point C (HPC) Development Project, following detailed design updates.
- 1.1.2 Any changes in methodology between the previous licence revisions and this variation need to be fully assessed to establish whether the potential for significant impacts to occur on the marine environment have changed from what was previously assessed as a result of the detail design and methodology updates.
- 1.1.3 There are ten activities associated with the sixth licence variation, as follows:
- Activity 1.1: Capital dredge at intake/outfalls;
 - Activity 1.2: Maintenance dredge at intake/outfalls;
 - Activity 1.3: Drilling of vertical shafts;
 - Activity 1.4: Disposal of drill arisings;
 - Activity 1.5: Disposal of Tunnel Boring Machines (TBMs);
 - Activity 1.6: Installation of intake/outfall heads;
 - Activity 1.7: Installation of Fish Recovery and Return System (FRS) outfall head;
 - Activity 1.8: Installation of Acoustic Fish Deterrent (AFD);
 - Activity 1.9: Temporary structures; and
 - Activity 1.10: Disposal of capital and maintenance dredge material.
- 1.1.4 A separate Environmental Impact Assessment (EIA) has been undertaken to assess the potential for impact on environment resulting from Activities 1.1 – 1.9 and supports the sixth licence variation. This Non-Technical Summary (NTS) solely focusses on Activity 1.10 in the variation.
- 1.1.5 Activity 1.10 relates to the disposal of material generated from dredging for the offshore marine infrastructure preparation and construction works at the HPC Development Project to the Portishead Disposal Site (hereafter referred to as the 'Disposal Site').
- 1.1.6 The applicant was previously granted a Marine Licence for disposal of material to the Cardiff Grounds Disposal Site, which was valid from 22 March 2018 to 04 March 2019. With this licence having expired, the applicant will make an application to the Marine Management Organisation (MMO) to vary the existing licence for use of Portishead Disposal Site (LU070) as a destination for the dredged material.
- 1.1.7 The applicant will, at the same time, be seeking consent for a separate Marine Licence from Natural Resources Wales (NRW) for disposal of the same dredged material at the Cardiff Grounds Disposal Site. It should be noted that dredged material will only be disposed of at one of these two sites; there will be no change in the total volume to be dredged or disposed.

1.2 Document purpose

- 1.2.1 To support the application to the MMO, an EIA has been undertaken in accordance with the *Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)* (hereafter referred to as the 'Marine Works (EIA) Regulations'). The EIA process identifies the key environmental effects of a development and identifies ways that these effects can be reduced and/or managed. An EIA is required by law for large developments that have the potential to cause significant environmental effects. The findings of this process are reported in a document called an Environmental Statement (ES). The ES will be in the public domain for anyone to view (see **Chapter 12**).
- 1.2.2 This NTS sets out a summary of the findings reported in full in the ES.

2. The Proposed Scheme Need and Alternatives

2.1 Need for the Proposed Scheme

- 2.1.1 A Marine Licence was originally granted in 2013 by the Marine Management Organisation (MMO) for works within the marine environment at the Hinkley Point C (HPC) Development Project site and has since been varied five times. Revision 3 of the licence, in 2017, permitted up to 280,000 m³ of dredged arisings to be disposed of in MMO disposal grounds. Permission was also granted by Natural Resources Wales (NRW) in 2018 to dispose up to 304,885 tonnes of dredged arisings to the Cardiff Grounds Disposal Site, with the first phase of dredging and disposal successfully completed in 2018. The applicant plans to commission further dredging in 2021 for the preparation and construction works for the marine infrastructure which is required for the HPC Development Project. Specifically, construction of the power station cooling water intake and outfall structures requires the locations of these structures to be prepared by dredging down to bedrock. Therefore, the existing Marine Licence (licence number: L/2013/00178) requires variation to allow for the Proposed Scheme.

2.2 Consideration of alternatives

- 2.2.1 The Marine Works (EIA) Regulations require the applicant to give due consideration to reasonable alternatives for the Proposed Scheme (see **Information Box 1**).

Information Box 1

The Marine Works (EIA) Regulations make two references to the consideration of alternatives, as follows:

They state that an Environmental Statement (ES) should include "*A description of the reasonable alternatives studied by the applicant which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment*"; and

States that an ES should include "*A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the applicant, which are relevant to the proposed project, the regulated activity and their specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.*"

Re-use or recycle

- 2.2.2 Several options were considered in order to try to re-use or recycle the material to be dredged during the site preparation for the offshore infrastructure associated with the HPC Development Project (such as re-use of the dredged material for the subgrade of service roads). However, the nature of the sediment (i.e. predominantly fine-grained) meant it would not be suitable for this purpose.
- 2.2.3 Additionally, proposals to trickle charge the sediment supply to the foreshore or for placement on the foreshore are not feasible due to the fact that the foreshore in the vicinity of Hinkley Point is rocky); so, if placed on the shore the material would be quickly eroded.

Dispersion

- 2.2.4 One option considered, which would ensure that the sediment remained within the River Severn sediment cell and Severn Estuary Special Area of Conservation (SAC) in accordance with a condition imposed on the HPC Development Consent Order (DCO) and Welsh marine planning policy, was local dispersion, whereby the material would be allowed to disperse from the dredger at the time of dredging. However, engagement with contractors determined that the dredge depth for the offshore infrastructure works could be 2 to 4 m below bed level and the volume of material to be produced within a small area by this amount of dredging would be too great to allow dispersal. There would also be a risk of material resettling in the dredged locations. This option was, therefore, discounted.

Local disposal

- 2.2.5 Another option considered was the local disposal of material in the vicinity of the works site. In order for local disposal to occur, the proposed placement site would need to be characterised and designated, as it is not currently a licenced disposal site. The implication of designating a disposal ground in this location is that it could be used in the future for other disposal activities (and by other applicants), with implicit environmental and safety implications.
- 2.2.6 Therefore, it was considered that disposal at an existing approved disposal ground within the Severn Estuary SAC was likely to be preferential to the creation of a new disposal site local to the works.

Disposal at the Cardiff Grounds

- 2.2.7 The use of the Cardiff Grounds Disposal Site (LU110) as an alternative destination for the dredged material is actively being considered by the applicant, and a separate Marine Licence application, for disposal of 100% of the dredged material at the Cardiff Grounds Disposal Site, will be submitted to NRW.). In order to retain sufficient flexibility and contingency to avoid critical construction programme risks, the applicant is pursuing two different option sites for disposal.

Disposal at Avonmouth (Inner)

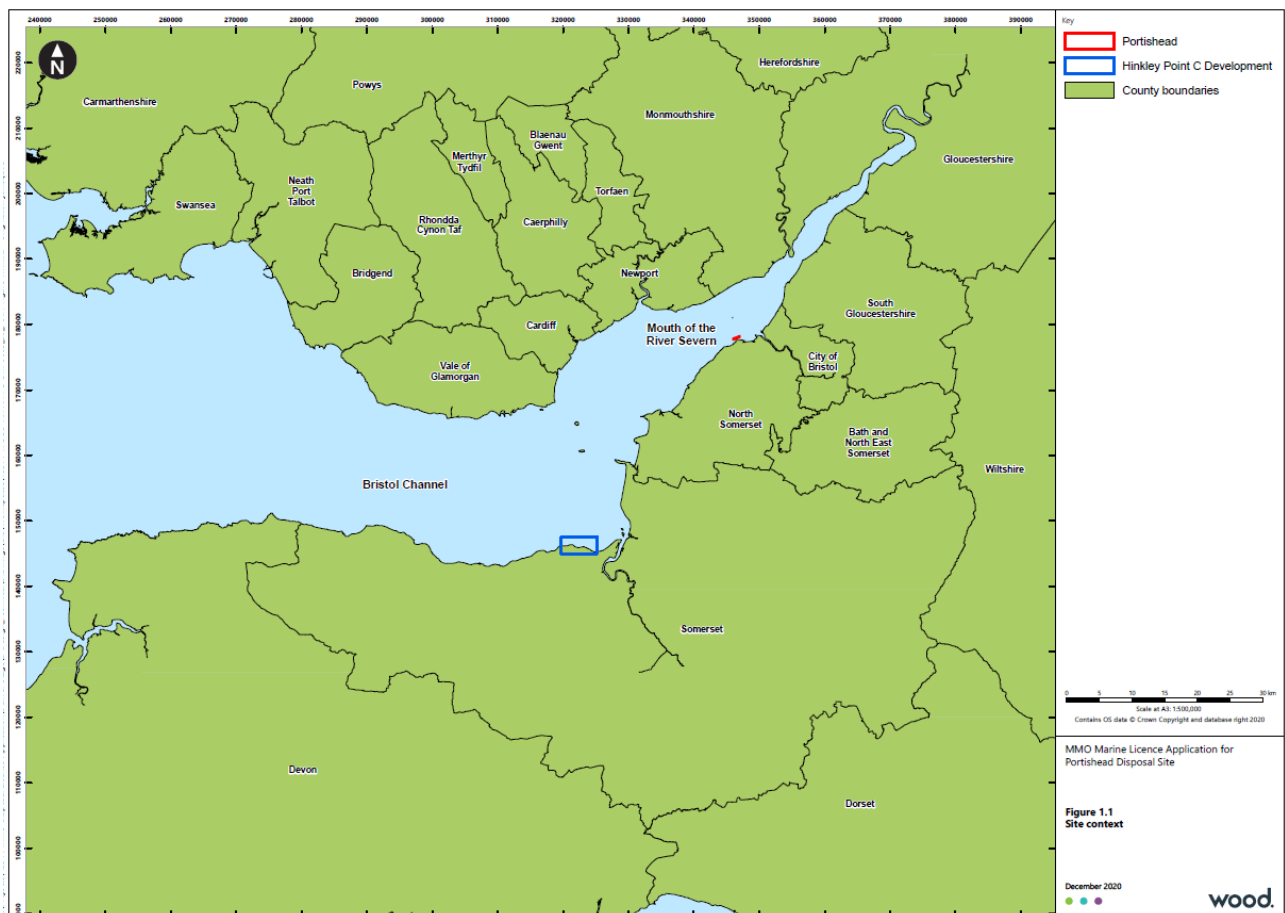
- 2.2.8 Initial analysis was also undertaken for the Avonmouth (inner) Disposal Site (LU080) in combination with the Portishead Disposal Site. This analysis suggested that there is capacity in both locations to accept the dredged arisings. However, disposal at the Portishead Disposal Site has the potential to minimise the environmental impacts arising from the Proposed Scheme, and so disposal of the full amount to the Portishead Disposal Site is being pursued.

3. Description of the Proposed Scheme

3.1 Location of the Proposed Scheme

- 3.1.1 The Hinkley Point C (HPC) Development Project is located on the Somerset coast, 25 km to the east of Minehead and 12 km to the north-west of Bridgwater (see **Figure 1.1**). There are three offshore locations where dredging is proposed for the infrastructure preparation and construction works: the cooling water intakes and outfalls, and a vessel flotation pocket.

Figure 1.1 Location of the Proposed Scheme



3.2 The Disposal Site

- 3.2.1 The Disposal Site (see **Figure 1.1**) covers an area of approximately 200 hectares and is situated on the English side of the Bristol Channel, approximately 2 km downstream of the Port of Bristol.
- 3.2.2 The Bristol Channel is a major inlet, separating South Wales from Devon and Somerset in South-West England. It extends from the lower estuary of the River Severn to the North Atlantic Ocean. The Severn Estuary is fed by the major rivers of the Severn, Wye, Avon and Usk and widens as it flows westwards towards the Bristol Channel.

3.3 Description of the dredging works and disposal

3.3.1 In 2018, a capital dredge campaign was undertaken to excavate six areas for the proposed HPC Development Project cooling water intakes and outfalls. The remaining works, inclusive of both capital and maintenance dredging (for further detail see **Information Box 2**) which are intended to be completed in 2021 comprise:

- the re-shaping and enlarging of areas dredged in 2018;
- the dredging in the vicinity of the outfalls to accommodate Heavy Lift Vessels; and
- maintenance dredging to remove silt which has accumulated between the 2018 campaign and the start of the 2021 campaign.

Information Box 2

Capital dredging: dredging to a depth not previously dredged, or to a depth not dredged within the last 10 years.

Maintenance dredging: is undertaken to keep areas at their designated depths.

3.3.2 The quantity of material arising from the capital dredge will be up to a maximum of 284,200 m³ and that arising from the maintenance dredge up to a maximum of 184,150 m³.

3.3.3 A number of different vessels will be used to undertake the work. These include:

- a backhoe dredger for capital dredging, making use of split hopper barges to transport and dispose of the material at the Disposal Site (see **Graphic 3.1**); and
- a trailer suction hopper dredger for capital and maintenance dredging, alongside the transport and disposal of material at the Disposal Site (see **Graphic 3.2**).

Graphic 3.1 Example of a backhoe dredger and supporting split hopper barge



Graphic 3.2 Example of a trailer suction hopper dredger



3.3.4 The anticipated programme for the works is shown in **Graphic 3.3**. It is anticipated that work will be undertaken 24 hours a day across two 12-hour shifts, 7 days a week. Standby maintenance dredging will be available throughout the entire campaign until the last head has been placed, which is currently scheduled for the end of September 2021.

Graphic 3.3 Programme

	April				May					June				July				August					September			
Week:	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4
Initial maintenance dredge																										
Capital dredge																										
Standby maintenance dredge																										

4. The Environmental Impact Assessment Process

4.1 Background

- 4.1.1 Environmental Impact Assessment (EIA) is a process to identify the likely significant effects of a project (in this case the Proposed Scheme) on the environment. It should be systematic, analytical, impartial, consultative, and iterative allowing environmental issues to be addressed in the design of a project.
- 4.1.2 The Marine Management Organisation (MMO) confirmed with the applicant that an EIA was required for the Proposed Scheme. This decision was made in accordance with Regulation 5 of the Marine Works (EIA) regulations and is known as 'requirement of EIA by agreement'.
- 4.1.3 Typically, the first stage in EIA is the production of Scoping Report. This is used to inform a request for a Scoping Opinion from the relevant decision maker (in this case the MMO). However, under the Marine Works (EIA) Regulations this is not a mandatory requirement, and this optional element of the EIA process has not been undertaken for the Proposed Scheme. This is due to the fact that the overarching environmental impacts and effects of the relevant dredging works related to the Proposed Scheme were addressed within the scope of the EIA (and reported in the Environmental Statement (ES)) for the Hinkley Point C (HPC) Development Consent Order (DCO) application and are considered in a separate EIA which has been undertaken to assess the potential for impact on environment resulting from Activities 1.1 – 1.9 and supports the sixth licence variation (see **Section 1.1**). The DCO consent imposed certain conditions relating to dredging activities which remain in place and the applicant is obliged to comply with these conditions. Therefore, for the Proposed Scheme, only an ES has been produced which addresses the direct and indirect impacts and effects that specifically relate to the transfer and disposal of the dredged arisings to the Disposal Site.

4.2 The Environmental Statement

- 4.2.1 The preparation of the ES is one of the key stages in the EIA process, as it brings together information about any significant environmental effects, which the MMO will use to inform its decision about whether the Proposed Scheme should be allowed to proceed.
- 4.2.2 The ES reports the findings of the EIA and brings together information about any likely significant environmental effects resulting from the Proposed Scheme. This Non-Technical Summary (NTS) summarises its key findings. The topics addressed in are outlined in **Table 4.1**, with an overview of the key findings from each of the topics in the ES provided in the subsequent chapters of this NTS.

Table 4.1 Topics addressed in the Environmental Statement

Topics that need to be assessed under the Marine Works (EIA) Regulations	Topics in the Environmental Statement
Population	Scoped out of the assessment
Human health	Scoped out of the assessment
Biodiversity	Chapter 5: Marine Ecology
Land	Chapter 7: Marine Physical Processes

Topics that need to be assessed under the Marine Works (EIA) Regulations	Topics in the Environmental Statement
Soil	Chapter 7: Marine Physical Processes Chapter 8: Marine Water and Sediment Quality
Water	Chapter 7: Marine Physical Processes Chapter 8: Marine Water and Sediment Quality
Air	Scoped out of the assessment
Climate	Chapter 6: Climate Change
Material assets	Chapter 9: Shipping and Navigation
Cultural heritage	Scoped out of the assessment
Landscape	Scoped out of the assessment
Major accidents and disasters	Scoped out of the assessment
Waste and resource use	Scoped out of the assessment
Interaction between the above factors	Considered within each individual environmental topic chapter
Cumulation with other projects	Chapter 10: Cumulative Effects Assessment
Transboundary effects	Scoped out of the assessment

5. Marine Ecology

5.1 Introduction

- 5.1.1 A desk study was carried out to assess the impact the Proposed Scheme would have on marine ecology. Data has been sourced from numerous publicly available sources.
- 5.1.2 The Disposal Site is located within the Severn Estuary which is the largest coastal plain estuary in the United Kingdom and one of the largest estuaries in Europe. The estuary is a major inlet, separating South Wales from Devon and Somerset in South-West England.

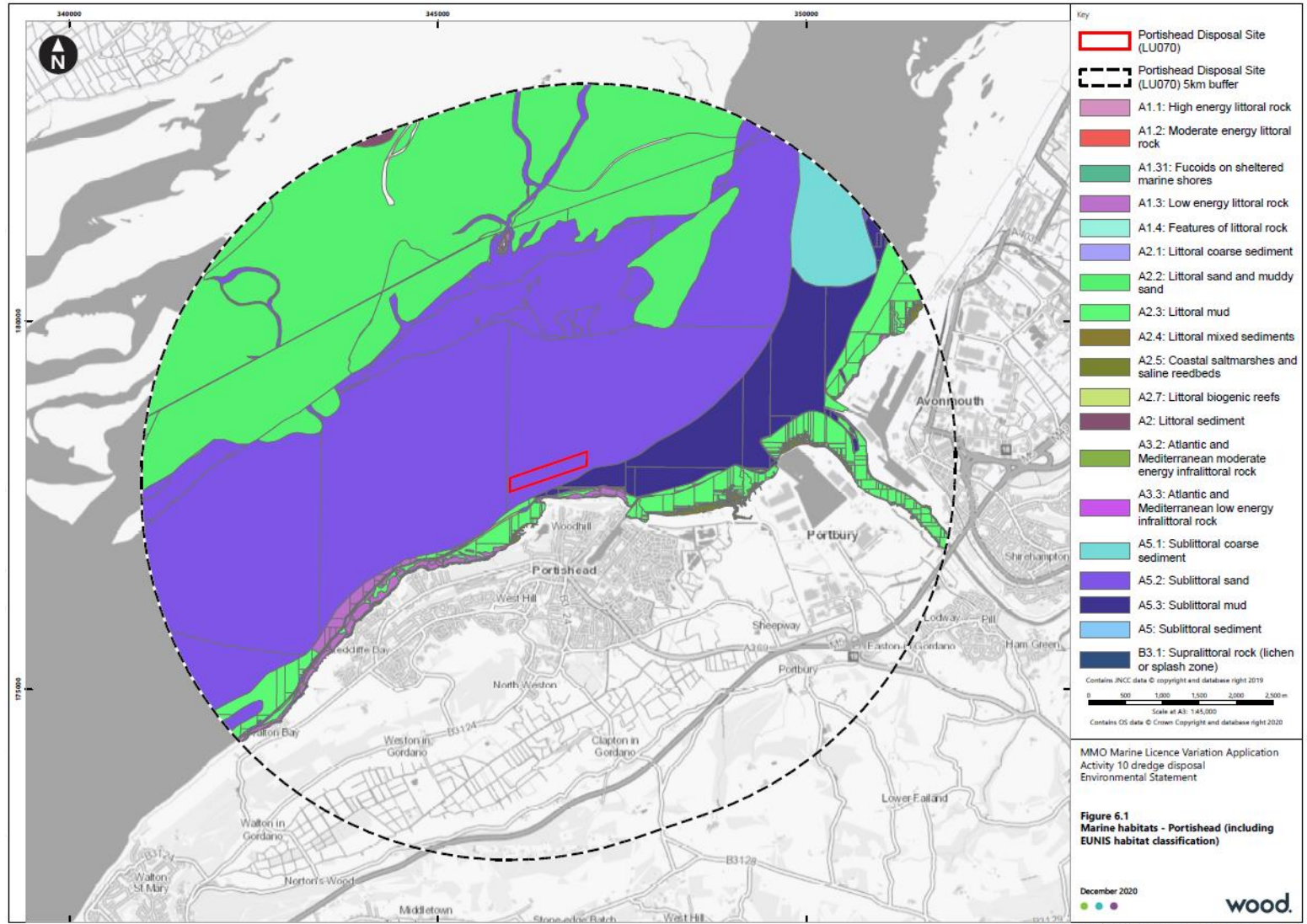
5.2 Benthic ecology

- 5.2.1 The benthic habitat within the Disposal Site is made up largely of sand. This habitat consists of clean medium to fine sands or non-cohesive slightly muddy sands on open coasts, offshore or in estuaries and marine inlets (see **Figure 5.1**).
- 5.2.2 The Honeycomb worm, and the Ross worm, are both found in the Severn Estuary and form biogenic reefs which are classed as Habitats of Priority Importance (HPI) (see **Information Box 3**). Subtidal reefs occur in dense aggregations throughout large parts of the mouth of the Estuary. There are patches of intertidal reef throughout the Estuary, although it tends to be more common on the English side, notably approximately 290 m from the Disposal Site boundary. These reefs are important due to their ability to provide microhabitats which increase local biodiversity. The subtidal Honeycomb worm) s most commonly found in the outer parts of the Estuary.

Information Box 3

Habitats of Priority Importance: a list of habitats and species which are of principle importance for the conservation of biodiversity in England. This list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England when carrying out their normal functions.

Figure 5.1 Marine habitats - Portishead (including EUNIS habitat classification)



5.3 Fish

- 5.3.1 The fish community in the Severn Estuary is notably species rich; both species richness and the total abundance of species reach a maximum in late summer and autumn. The abundance of many species of fish has increased in the Severn Estuary between the 1970s and 1990s. Furthermore, since around 2002, the rate of increase has accelerated by a factor of two to four. The most abundant fish species present in the Estuary have not changed since the 1850s, and therefore these species will have become somewhat habituated to the turbid nature of the Severn Estuary.
- 5.3.2 The Severn Estuary acts as an important nursery ground for many commercially valuable species, to the extent that many of the fish found within the Estuary are in their juvenile life stages. No spawning grounds are recorded within the Estuary, likely due to the fact that many of the fish species are broadcast spawners that spawn within the water column or seek specific gravelly habitats, such as herring.
- 5.3.3 Existing evidence suggests that internationally protected migratory species of Atlantic salmon, allis shad, twaite shad, river lamprey, sea lamprey and eel are found within Severn Estuary at some point during their migration. Little fish data exists around the Disposal Site, but the area is likely to be a migration route for fish identified in the data from the upper estuary catchments.
- 5.3.4 Salmon catches have reduced considerably in recent decades in the three major Severn Estuary tributaries (Severn, Wye and Usk) in common with many other parts of the eastern North Atlantic. Although widespread throughout the UK, it is estimated that the spawning population for the UK salmon stock is currently approximately 50% down on the ten-year average.
- 5.3.5 Sea trout are less abundant than salmon in the Severn Estuary tributaries and net catches have generally been low since 1965, exceeding 100 individuals per year on only 10 occasions. No sea trout have been caught in any of these fisheries since 2000, attributed to fishery reduction or closure. The Rivers Usk and Severn have had the highest catches, although these have declined since 2000.
- 5.3.6 Within England and Wales over half of the 20 Special Areas of Conservation (SAC) designated for the presence of lamprey species are situated on the Welsh coast including the Rivers Wye and Usk and the Severn Estuary.
- 5.3.7 It is believed that >90% of the UK glass eel catch is derived from the Severn and its tributaries, including the Wye. There are also glass eel fisheries on the River Parrett.

5.4 Marine mammals

- 5.4.1 Four marine mammal species are known to occur within the Severn Estuary: harbour porpoise, bottlenose dolphin, harbour seal and grey seal. Further reports also state that Risso's dolphin, common dolphin and minke whale have been recorded annually as seasonal visitors to the Severn Estuary and Bristol Channel.
- 5.4.2 The Central and Outer Bristol Channel have been highlighted as a potentially important area for harbour porpoise with sightings being recorded near Portishead at Battery Point, which lies in the vicinity of the Disposal Site. Although harbour porpoise and other marine mammal species are present, available evidence indicates that the Severn Estuary does not support any major populations of cetacean species and harbour porpoise sightings are less common. These species generally have large foraging ranges and are therefore occasional visitors to the area.

- 5.4.3 Grey seals are regularly observed in the Outer and Central Bristol Channel, although usually in small numbers and have been recorded in the past at Battery Point but sightings are rare.
- 5.4.4 The bottlenose dolphin is occasionally sighted in the Inner Bristol Channel although it is considered an infrequent visitor. There have been no recent sightings from any of the recent surveys undertaken in the Bristol Channel and Swansea Bay from the literature reviewed for this assessment.

5.5 Birds

- 5.5.1 The diverse and extensive habitats of the Severn Estuary, particularly the intertidal mudflats and sandflats, provide feeding habitat for large numbers of waterbirds that move along the west coast of Europe during the spring and autumn migration period, as well as for wintering populations of ducks, waders, geese and swans.
- 5.5.2 A 5-year annual peak average of 3,036 waterbirds was recorded in the Severn Estuary within the vicinity of the Disposal Site by the Wetland Bird Survey (WeBS) between 2014-2019. For its size, this number of birds is relatively low in comparison with other UK estuaries and reflects the largely poor prey species available in much of the central sandflats of the estuary.
- 5.5.3 Seven species of wader are included as features of the Severn Estuary Special Protection area (SPA), five of which predominantly forage intertidally: ringed plover, grey plover, dunlin, curlew, redshank and shelduck.
- 5.5.4 During the winter period, the Severn Estuary is of particular importance to feeding shelduck, dunlin, redshank and curlew. The population of dunlin within the entire Severn Estuary is the third highest in the UK, with approximately a third of those birds falling on the Welsh side of the estuary. The population of redshank within the entire Severn Estuary is the ninth highest in the UK, with approximately one third of those birds found in the Severn Estuary falling on the Welsh side. The Severn Estuary is also an important refuelling and resting stop for many waders and wildfowl on their migrations during spring and autumn periods.

5.6 Conclusion

- 5.6.1 The existing marine ecology environment around the Disposal Site and the wider Severn Estuary is not expected to change as a result of the Proposed Scheme. The impacts of the Proposed Scheme will be of a temporary nature with no long-term significant effects predicted.

6. Climate

6.1 Introduction

- 6.1.1 The climate assessment considered the potential effects of transporting the dredged material from the dredging locations to the Disposal Site. Data collection has been undertaken to obtain information for the greenhouse gas (GHG) emitting activities of the Proposed Scheme from a variety of online sources.
- 6.1.2 The activities related to the Proposed Scheme are scheduled to be implemented from April 2021 to September 2021. Given the short timescale and near-term period over which the activities will be undertaken and the characteristics of the activities, which primarily involve vessel movements, there is no requirement to assess vulnerability to climate change.
- 6.1.3 In line with industry guidance, all GHG emissions from the Proposed Scheme are considered potentially significant, and hence an assessment has to be undertaken.

6.2 Greenhouse gas emissions

- 6.2.1 The potential effects of the Proposed Scheme are considered with respect to global GHG emissions. The GHG emissions which are included within the assessment relate only to those activities associated with the transport of dredged arisings and disposal at the Disposal Site. The key source of emissions associated with this activity is the vessel movements which will occur to the Disposal Site from the locations of the Hinkley Point C (HPC) Development Project marine infrastructure works. The GHG assessment includes the emissions that are predicted to be produced as a result of these specific activities and these calculations have been used to inform the extent to which the Proposed Scheme has a material effect on the UK Government's targets for decarbonisation.
- 6.2.2 When contextualised within the UK carbon target of net zero by 2050, the relevant UK carbon budget for 2018-2022 and current domestic shipping emissions, the GHG emissions associated with the Proposed Scheme are small in scale.

6.3 Conclusion

- 6.3.1 Due to the small scale of GHG emissions associated with the Proposed Scheme, it is considered that the Proposed Scheme would not have a significant effect on the UK meeting its net zero carbon target and the UK carbon budget. Furthermore, it should also be acknowledged that the Proposed Scheme is required to deliver the construction of the cooling water marine infrastructure for the HPC Development Project. The UK Government has acknowledged the importance of nuclear power, as a clean low carbon energy source, in achieving decarbonisation of the energy sector.
- 6.3.2 No significant climate change effects are expected as a result of the Proposed Scheme and therefore no additional mitigation measures are proposed.

7. Marine Physical Processes

7.1 Introduction

- 7.1.1 The assessment presented in the Environmental Statement considered the potential effects from the disposal activities that could influence marine physical processes (see **Information Box 4**) around the Disposal Site.

Information Box 4

Marine Physical processes consider the natural cycle of tides, the movement of currents, the wave climate, and the resulting sediment regime.

- 7.1.2 A wide range of studies have been undertaken to better understand the marine physical processes operating in the Bristol Channel and Severn Estuary. Much of this work was carried out in the 1970s and 1980s and although there has been relatively little survey data collection since then, much of this earlier work remains directly relevant to the Proposed Scheme and informed the assessment.
- 7.1.3 While the seabed of the Bristol Channel immediately seaward of the Severn Estuary is largely characterised by rock and gravel, the Severn Estuary is a more mixed environment with gravel and rock to seaward, large areas of sand in the east and landward parts of the Estuary and a muddy seabed along the west.

7.2 Waves, tides and currents

- 7.2.1 The Severn Estuary has a tidal range of over 6 m, and the tide is amplified as it travels up the narrowing and shallowing Bristol Channel and into the funnel-shaped Severn Estuary. This results in strong tidal currents. Further, currents become more flood dominated (faster currents on the flood tide than on the ebb tide) with distance upstream.
- 7.2.2 Wave conditions in the Severn Estuary inshore are dominated by wind wave generation within the Bristol Channel and the Severn Estuary itself. Wave conditions in the Severn Estuary in general and at Avonmouth, are most severe under south westerly winds. The effect of water level on waves in the Estuary is that wave heights are higher at higher water levels.

7.3 Coarse sediment transport

- 7.3.1 Bed levels in the Disposal Site experience major changes due to the large tidal ranges in the estuary. The bed level may change by more than 1 m over the course of every cycle as silts and sands which settle on less energetic tides are disturbed by the faster spring tide currents.
- 7.3.2 The extremely dynamic nature of the Severn Estuary (i.e.) an exceptionally large tidal range and its physical scale, strongly suggest that in order for any observable physical change to occur due to a human intervention, it would have to be very large.

7.4 Conclusion

- 7.4.1 Most impacts on marine physical process as a result of the Proposed Scheme would be negligible. The suspended sediment concentration of the plume associated with the Proposed Scheme is small

compared to the natural variation in background suspended sediment concentration. There is the potential for the placement of dredged material from the Proposed Scheme to increase bed level at the Disposal Site, although it has been assessed to only be significant in the short-term, with no long-term impacts anticipated. To minimise potential changes to the bed level, monitoring of the Disposal Site pre- and post-disposal activity will be agreed with the Marine Management Organisation, if required.

8. Marine Water and Sediment Quality

8.1 Introduction

- 8.1.1 The studies into marine water and sediment quality have been informed through a desktop study and using data from a number of sediment sampling campaigns. Sediment Quality. A number of sediment sampling campaigns have also been commissioned by the applicant in relation to the construction works at the Hinkley Point C site, with the most recent campaign completed in Autumn 2020.
- 8.1.2 During the most recent, 2020 campaign, samples were collected in line with a sediment sampling plan formulated by the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Analysis (radiological and non-radiological) has been undertaken on the findings of this work, based on the results for samples taken around the intake and outfall locations.
- 8.1.3 For preliminary radiological assessment of sediment samples, International Atomic Energy Agency (IAEA) assessment procedures were applied. The IAEA advises on the definition of levels of specific activity, below which materials can be regarded as 'non-radioactive' and may be disposed of at sea.
- 8.1.4 For non-radiological assessment, levels of chemical determinands were compared against Cefas Action Levels (see **Information Box 5**).

Information Box 5

Cefas Action Levels determine the suitability of dredged material for disposal at sea and two Action Levels are employed. Contaminant concentrations that are below those defined for Action Level 1 are not considered to be of environmental concern and hence are unlikely to influence the disposal options. However, when contaminants are present above Action Level 2 the dredged sediment is not considered suitable for reuse or disposal at sea.

8.2 Marine sediment quality

- 8.2.1 The results of the 2020 sediment sampling campaign showed low concentrations of both naturally occurring and anthropogenic radioactivity were detected within the sampled material.
- 8.2.2 No chemical determinands were determined to be at or above Cefas Action Level 2 at any sampling station. Exceedances of Action Level 1 for a number of chemical determinands were recorded at all sites. Most exceedances occurred in the samples of surface sediment, and concentrations at depth were generally below the limit of detection. The findings of the 2020 sediment sampling campaign are broadly consistent with previous results from sampling within the Severn Estuary near Hinkley Point, where background concentrations were typically found to exceed Action Level 1. The site-specific sample results are generally similar to or lower than those reported for the wider Severn Estuary for various metals, including copper, nickel, cadmium and lead.
- 8.2.3 Therefore, it is concluded that the sediment being dredged from the HPC Development Project site, and subsequently disposed of at the Disposal Site, is comparable with the quality of sediment present within the wider estuarine environment.

8.3 Marine water quality

- 8.3.1 The potential for changes to arise in marine water quality are due to the release of sediment-bound contaminants, held within the material being disposed of at the Disposal Site. Although there are examples of exceedance of Cefas Action Level 1, levels of measured chemical determinands comply with Action Level 2, and show levels which are comparable to, or lower than, those recorded elsewhere within the Severn Estuary. The chemical quality of the sediment is also comparable to that previously disposed of within the Disposal Site, as confirmed by the Marine Management Organisation.
- 8.3.2 From a physical water quality perspective, the Severn Estuary is a highly turbid environment, resulting in high transport and mixing of sediments in the water column. An analysis of changes to the chemical water quality has not been undertaken, with material likely to settle out of the water column within one or two tidal cycles, therefore contamination of the water itself is considered unlikely.

8.4 Conclusion

- 8.4.1 The Proposed Scheme is anticipated not to have a significant impact on the water and sediment quality in the area. No additional mitigation measures are proposed to further reduce the marine water and sediment quality effects that are identified. Due to the short-term nature of the works required for the Proposed Scheme, no changes to the current environmental conditions during the period are expected.

9. Shipping and Navigation

9.1 Introduction

- 9.1.1 A desk study was carried out to assess the impact the Proposed Scheme will have on shipping and navigation within the area. Several ports are located in the vicinity of the dredging locations and Disposal Site at Portishead. The closest port to the Disposal Site is Bristol Port, comprising of Avonmouth and Royal Portbury docks. Royal Portbury Dock is the closest of the two and is located approximately 1.6 nautical miles (nm) east of the Disposal Site. Bristol Port is the busiest port in the vicinity of the Portishead Site with 1,227 vessel arrivals in 2019. Portishead Quays Marina is located approximately 0.5 nm south-east of the Disposal Site.
- 9.1.2 The key vessel types identified as travelling through the Disposal Site were cargo vessels (56%), tugs (17%) and dredgers (3%), mainly visiting Bristol Port. On average, eight vessels per day travelled through the site. Recreational vessels were recorded near to the Disposal Site at Portishead Quays Marina, the majority of which were active in summer. Low levels of tankers and other vessel movements were also recorded within the Disposal Site.
- 9.1.3 No vessels were recorded disposing of dredged material. However, information from the Bristol Port Company indicated that the Disposal Site is used approximately 6-8 times per year.

9.2 Disruption to Commercial Vessels

- 9.2.1 Vessel movements associated with the disposal of dredged material may lead to disruption to commercial vessel routing and subsequently could increase collision risk, particularly in higher density shipping areas. This includes shipping channels associated with cargo vessels and dredgers transiting to and from ports such as Bristol, Cardiff and Newport.
- 9.2.2 It is expected that the majority of vessels in the area will be aware of the dredging works prior to encountering the project vessel(s) through measures such as the Notices to Mariners, Radio Navigation Warnings and Navigational Telex., as well as the VTS monitoring vessel movements in the area. Furthermore, all vessels are expected to comply with the International Regulations for Preventing Collisions at Sea (COLREGs) and, given the limited increase in vessels compared to the baseline levels of vessel activity in the area, significant effects are not expected to arise.

9.3 Disruption to fishing and recreational activities

- 9.3.1 Although recorded fishing and recreational activity levels were low, vessel movements associated with the disposal of dredged material have the potential to disrupt such activities. Similarly to commercial vessels, it is expected that fishing and recreational craft will be aware of the dredging works prior to their commencement.
- 9.3.2 Due to the relatively low frequency of fishing vessels and recreational craft, the short-term nature of the dredging works and best practice measures in place, the disruption to fishing and recreation activities is anticipated to be low and not result in a significant effect.

9.4 Disruption to dredgers

- 9.4.1 There may be disruption to other dredgers and disposal craft using the Disposal Site during the works. Information from Bristol Port Company indicated that the Disposal Site is used approximately 6-8 times a year. Other data has shown that no dredgers were recorded using the Disposal Site during August 2019 or December 2020. It is expected that any disruption can be managed by good communication between the applicant and other dredging companies. Hence, no significant effects are expected to arise.

9.5 Conclusion

- 9.5.1 It is expected that the majority of vessels (commercial, fishing and recreational) in the area will be aware of the dredging works before encountering the project vessel(s) through the best practice measures outlined above. Furthermore, all vessels are expected to comply with COLREGs and there will be a limited increase in vessel transits when compared to the existing levels of vessel activity in the area. Therefore, the Proposed Scheme is not anticipated to have a significant impact on shipping and navigation.

10. Cumulative Effects Assessment

10.1 Introduction

10.1.1 This chapter presents the cumulative effects that may arise as a result of the Proposed Scheme. The assessment has been informed through a review of the assessments that make up this Environmental Statement (ES), the separate Environmental Impact Assessment (EIA) application that discusses Activities 1.1 – 1.9 of this licence variation, and a desktop study of the existing Marine Licences and projects in the Bristol Channel / Severn Estuary area.

10.1.2 For the cumulative effects assessment (CEA), two types of effect have been considered, inter-project and intra-project (see **Information Box 6**).

Information Box 6

- Inter-project effects: arise as a result of the Proposed Scheme in combination with other large-scale developments or projects; and
- Intra-project effects: effects that occur as a result of two or more impacts acting together (i.e.) combined, to result in a new or changed effects on a single receptor.

10.2 Methodology

10.2.1 The ES of the Hinkley Point C (HPC) Development Consent Order (DCO) assessed three types of project cumulative effects and this approach has been followed for this Marine Licence application (see **Table 10.1**)

Table 10.1 Project cumulative effects assessed as part of part of the HPC DCO

Effect	Description
Site-specific cumulative effects	<p>Considered as intra-project effects, effects that arise from each of the HPC Development Project components individually. Different aspects of each of these components may themselves have additive or interactive effects.</p> <p>The assessment of site-specific cumulative effects forms part of the main environmental impact assessment for each of the technical environmental topics and are, therefore, assessed within the topic chapters of the ES.</p>
Project-wide cumulative effects	<p>Considered as inter-project effects, effects that arise from the combined effects (additive or interactive) of the full HPC Development Project, that is, the cumulative effects of any part of the HPC project with another component(s).</p> <p>Project-wide cumulative effects include other ongoing or planned</p>

Effect	Description
Wider cumulative effects	<p>sub-projects or activities at Hinkley Point C that are anticipated to overlap with the Proposed Scheme.</p> <p>Considered as inter-project effects, the combined effects (additive or interactive) that may occur between any component(s) of the HPC Development Project and any 'non-HPC Project' (other) developments that do not form part of the HPC Development Project (referred to in this assessment as 'non-HPC Project developments').</p> <p>For wider cumulative effects, an exercise was carried out to evaluate whether any of the projects included within the assessment provided within the HPC DCO ES, could have potential cumulative effects in combination with the Proposed Scheme. This exercise also established whether any new plans or projects have reached the planning stage since the previous DCO assessment which could lead to cumulative effects between non-HPC project development and the Proposed Scheme.</p>

- 10.2.2 Screening of all marine projects within the Bristol Channel/Severn Estuary has been undertaken to understand the potential cumulative impact pathways that could be experienced. Following professional judgement on the worst-case extent of the sediment plume, the Zone of Influence (Zol) for the Proposed Scheme has been defined in terms of a spatial envelope which extends to a distance of 20 km from the Disposal Site. Major applications for projects in the Bristol Channel/Severn Estuary have also been included in the CEA. Given that the Proposed Scheme is entirely marine based, any land based projects that do not extend below mean high water have been excluded from further assessment.
- 10.2.3 The disposal activities of the Proposed Scheme will only occur during the programme of works, defined as April 2021 – September 2021 (see **Graphic 3.3**), and define the temporal scope of this assessment. As the Proposed Scheme does not include the dredging activities themselves, or construction/operation of the marine infrastructure associated with the HPC Development Project, this CEA does not assess effects after the programme of works for the Proposed Scheme has finished. This is because the dispersal of a vast majority of the disposed associated with the Proposed Scheme will occur almost immediately following disposal. Therefore, the temporal scope of potential cumulative effects for the Proposed Scheme will be the months between April 2021 – September 2021, inclusively.
- 10.2.4 Eighteen projects in the Bristol Channel / Seven Estuary were considered within the cumulative assessment, with nine of these projects assessed further. These nine projects included: the separate EIA project for activities 1.1 – 1.9 of the marine licence variation, five marine aggregate extraction licences, Bridgwater Tidal Barrier, the Bristol Ports disposal licence usage at the Disposal Site, and various disposal licences at disposal sites located throughout the Bristol Channel / Severn Estuary.

10.3 Assessment

- 10.3.1 From a physical water quality perspective, the Bristol Channel/Severn Estuary is a highly turbid environment. For maintenance material, the sediment plume created by the Proposed Scheme is

small compared to levels naturally occurring in the region and mixing of the plume will reduce concentrations further to negligible levels. For capital material, increases will be at a lower magnitude than for the maintenance material, therefore effects would also be considered negligible.

- 10.3.2 Analysis of the material to be disposed of has confirmed that the sediment being dredged from the HPC Development Project, and subsequently disposed of at the Disposal Site, is comparable with the sediment present within the wider estuarine environment. Any changes to sediment/water quality as a result of the Proposed Scheme would be negligible and not significant. Any accidental releases of pollutants/contaminants will be diluted and not expected to be detectable within 500 m of the spillage occurring.
- 10.3.3 The marine ecology assessment concluded that no significant effects on marine ecology receptors as a result of increased suspended sediment and localised changes in water quality are likely to arise as result of the Proposed Scheme.
- 10.3.4 Due to the temporary nature of the Proposed Scheme and the low number of vessel movements, it is not anticipated that there would be a significant increase in light, noise, or vibration from vessel activity from the Proposed Scheme, particularly when compared with the busy shipping baseline of the Severn Estuary. Existing populations of migratory fish, intertidal birds and marine mammals in the Severn Estuary will have become habituated to a certain level of disturbance, noise, and vibration from current levels of vessel movements.

10.4 Conclusion

- 10.4.1 The CEA considers whether any of the projects included within the CEA could result in cumulative effects in combination with the Proposed Scheme which would affect the conclusions of the individual environmental topic assessments included within the ES.
- 10.4.2 The effect from the overall cumulation of project sediment disturbances would be temporary and localised, and the plumes from the Proposed Scheme would occur at a low frequency of disposals per day and only occur throughout the relatively short programme of works. Due to the low frequency and magnitude of effects associated with the Proposed Scheme, the distances between the Proposed Scheme and other projects, and the existing conditions of the Severn Estuary, the significance of any potential impact is considered not to change from the conclusions reached for the relevant environmental topic assessments. Any effect as a result of localised changes in water quality would not be significant.
- 10.4.3 The cumulative effect from elevated levels of noise, light, or vibration would be temporary and localised as a result of the Proposed Scheme and other projects. Due to the low frequency and magnitude of effects associated with the Proposed Scheme, the distances between the Proposed Scheme and other projects, and the existing conditions of the Severn Estuary, the significance of any potential impact is considered not to change from the conclusions reached for the relevant environmental topic assessments. Embedded mitigation measures to mitigate noise effects with respect to marine fauna will be implemented as part of the Proposed Scheme. No significant effects on marine ecology receptors as a result of the slight increase in marine vessel movements are likely to arise as result of the Proposed Scheme.

11. Summary

11.1 Introduction

11.1.1 Each of the environmental topics have been the subject of an assessment carried out by competent experts, and include consideration of mitigation measures to avoid, reduce or compensate for effects. The likely significant effects account for the implementation of such measures.

11.2 Overall summary of effects

11.2.1 A summary of the effects arising due to the Proposed Scheme is provided in **Table 11.1**.

Table 11.1 Summary of effects

Receptor and summary of predicted effects	Significance	Summary rationale
Marine Ecology	Not significant	There are a number of effects that the Proposed Scheme will have on marine ecology receptors within the vicinity of the Disposal Site in the Severn Estuary. These effects are all of a temporary and short-term nature. As a result, there are no effects to marine ecology receptors as a result of the Proposed Scheme that are anticipated to be greater than minor.
Climate	Not significant	Greenhouse gas (GHG) emissions associated with the Proposed Scheme are estimated to be low. Due to the small scale of GHG emissions associated with the Proposed Scheme, it is considered that the Proposed Scheme would not have a material effect on the UK meeting its net zero carbon target and the UK carbon budget. Based on this, the Proposed Scheme is considered to not have a significant effect upon the global climate.
Marine Physical Processes	Not significant	All of the placed material will be dispersed into the water column (finer material) and existing sediment transport regimes (coarser material, or eroded claystone, mudstone and shale). Any changes in bed level arising from placement of sediments at the Portishead Site will be temporary, and in line with levels of natural variation in sediment distribution and bed levels over the tidal cycle within the Severn Estuary. The Proposed Scheme is anticipated to have a negligible and not significant effect on tides, currents, waves, salinity, sediment transport and suspended sediment concentrations.
Marine Water and Sediment Quality	Not significant	The Proposed Scheme is not anticipated to have a significant effect on sediment quality in the area. The sediment being dredged from the HPC Development Project site, and subsequently disposed of at the Disposal Site, is comparable with the quality of sediment present within the wider estuarine environment.

Receptor and summary of predicted effects	Significance	Summary rationale
Shipping and Navigation	Not significant	<p>As the material will settle out quickly and be subsumed into the natural water and sediment transport regimes of the area, there will be no significant effect on water quality.</p> <p>It is expected that the majority of vessels (commercial, fishing and recreational) in the area will be aware of the dredging works before encountering the project vessel(s) through measures including, but not limited to Notices to Mariners, Radio Navigation Warnings and Navigational Telex,. Furthermore, all vessels are expected to comply with International Regulations for Preventing Collisions at Sea (COLREGs) and there is a limited increase in transits compared to the existing levels of vessel activity in the area.</p> <p>It is expected that any disruption can be managed by good communication between the applicant and the dredging companies, and hence significant effects are not expected to arise.</p>
Cumulative Effects Assessment	Not significant	<p>The cumulative effect from the cumulative project's sediment disturbances would be temporary and localised as the plumes from the Proposed Scheme would occur at a low frequency of disposals per day and only occur throughout the short-term programme of works. Due to the low frequency and magnitude of effects associated with the Proposed Scheme, the distances between the Proposed Scheme and other projects, and the existing conditions of the Severn Estuary, the significance of any potential impact is considered not to change the relevant environmental topic assessment conclusions. Any effect as a result of localised changes in water quality would not be significant.</p> <p>The cumulative effect from elevated levels of noise, light, or vibration would be temporary and localised as a result of the Proposed Scheme and cumulative projects. Due to the low frequency and magnitude of effects associated with the Proposed Scheme, the distances between the Proposed Scheme and other projects, and the existing conditions of the Severn Estuary, the significance of any potential impact is considered not to change the relevant environmental topic assessment conclusions.</p>

12. Further Information

- 12.1.1 The Environmental Statement (ES) has been submitted to the Marine Management Organisation (MMO) who will make a decision on the application in consultation with various stakeholders. These will include government bodies, agencies, and the general public.
- 12.1.2 Feedback from the consultees will be taken into consideration by the MMO as they make their decision on the Marine Licence.
- 12.1.3 This ES is available online via the MMO website at the following link: https://marinelicensing.marinemanagement.org.uk/mmofox5/fox/live/MMO_LOGIN/login and via the EDF HPC website at the following link: <https://www.edfenergy.com/energy/nuclear-new-build-projects/hinkley-point-c/about/non-material-change-consultation>.
- 12.1.4 Hard copies can be made available, for a fee, on request, from the applicant at hinkleyenquiries@edf-energy.com.

