



PEMBROKE 132KV CABLE REINFORCEMENT

Habitats Regulations Assessment - Information to Inform an
Appropriate Assessment

National Grid

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Executive Summary

1. This Habitats Regulations Assessment Information to Inform an Appropriate Assessment report has been produced by RSK Biocensus on behalf of National Grid. It is required as part of an application for the proposed c.11.5 kilometre (km) cable route connection along the A477 road, between the existing Golden Hill (OS Grid Reference SM 99044 02398) and Milford Haven (OS Grid Reference SM 94820 08106) substations in Pembrokeshire, Wales. It comprises stage 1 (Screening) and stage 2 (Appropriate Assessment) of the Habitats Regulations Assessment process.
 2. Nine European sites were identified within 10 km of the proposed development. Potential impact pathways were identified in relation to noise/vibration disturbance, visual disturbance, changes in water and air quality, spread of invasive non-native species, and disturbance from electromagnetic fields.
 3. Taking into consideration the likely zone of influence for each potential impact pathway, only the closest European site, Pembrokeshire Marine/Sir Benfro Forol Special Area of Conservation (SAC), was scoped into the screening assessment.
 4. On completion of the screening assessment, it was concluded that the potential for likely significant effects could not be ruled out (either alone or in combination) for the Pembrokeshire Marine/Sir Benfro Forol SAC in relation to:
 - Construction phase:
 - Noise and vibration disturbance (sea and river lamprey, allis and twaite shad, and otter)
 - Visual disturbance (otter)
 - Operational phase:
 - EMF (sea and river lamprey, allis and twaite shad, and otter)
- Stage 2 (Appropriate Assessment) of the Habitats Regulations Assessment process was therefore required for these impacts.
5. The Stage 2 Appropriate Assessment concluded that there would be no adverse impacts (alone or in combination) on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of the proposed development.

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1 Introduction

1.1 Purpose of this report

- 1.1.1 This report has been produced by RSK Biocensus on behalf of National Grid. It is required as part of pre-construction documentation and consultation for the proposed c.11.5 kilometre (km) cable route connection along the A477 road between the existing Golden Hill (OS Grid Reference SM 99044 02398) and Milford Haven (OS Grid Reference SM 94820 08106) substations in Pembrokeshire, Wales, hereafter referred to as the 'proposed development'.
- 1.1.2 Under the Conservation of Habitats and Species Regulations 2017, all competent authorities must consider whether any plan or project could affect a European site before it can be authorised or carried out. This includes considering whether it will have a 'likely significant effect' on a European site, and if so, they must carry out an 'appropriate assessment'. This process is known as a Habitats Regulations Assessment (HRA). Within this report, the term 'European site' has been used to refer to Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites, which form part of the UK 'National Site Network'.
- 1.1.3 This report comprises stage 1 (Screening) and stage 2 (Appropriate Assessment) of the HRA process (refer to Section 2 for further details of the assessment methodology).
- 1.1.4 The competent authorities for undertaking the assessment of this project are considered to be National Grid as statutory undertaker, with consultation with Natural Resource Wales.

1.2 Landscape context

- 1.2.1 The start of the c.11.5 km cable route is at the existing Golden Hill substation, located to the northeast of the town of Pembroke. The route travels along the A477 road, through Pembroke Dock town, crosses the Cleddau Bridge and the river, continues through Honeyborough village, and ends at the existing Milford Haven substation, southwest of Rosemarket village. Half of the cable route lies within suburban or developed areas surrounded by residential housing, while the other half passes through countryside with hedgerows, large arable fields, and pockets of woodland.

1.3 Proposed development

Overview

- 1.3.1 Following the National Grid Electricity Distribution (NGED) assessment of future demand and generation growth, Engineering Justification Paper EJP179 was approved as part of NGED's ED2 Load Related Expenditure program. This project not only addresses capacity constraints but also enhances network resilience, ensuring compliance with security of supply standards and supporting future network developments, including potential renewable generation connections and increased electrification demand.
- 1.3.2 To deliver EJP179, two new 132kV circuits need to be installed between Pembroke Grid Supply Point (GSP), Golden Hill Bulk Supply Point (BSP) and Milford Haven Grid.

- 1.3.3 This report considers the works associated with Circuit 2, The Milford Haven Grid to Golden Hill BSP – the c.11.5km working area includes c.9km of new 132kV underground cable circuit connecting Milford Haven BSP to Golden Hill BSP. This will terminate onto the existing 132kV overhead circuit at Golden Hill, enabling the reconfiguration necessary to link Milford Haven to Pembroke through the newly installed cable circuit. The cable route is shown on Figure 1.

Construction phase

- 1.3.4 The cable installation will include open cut excavation, duct installation, cable pulling and backfill/reinstatement within public highway from Golden Hill substation to the start of the Cleddau Bridge Crossing. The 132kV cable will then cross the Cleddau Bridge within an existing services structure beneath the bridge deck. The 132kV cable installation then continues along the highway before entering an agricultural field.
- 1.3.5 Due to structural constraints on the bridge crossing the Westfield Pill, the cable will cross beneath the watercourse to the north of the A477. The crossing will be undertaken by Horizontal Directional Drill (HDD) method at a depth of 15-20 m below the bed of the watercourse. A draft design of the HDD was used for the assessments made in this report (National Grid, 2025b), the HDD design includes up to two boreholes, allowing for up to two cable ducts. A feasibility report for the HDD works has also been produced (OCU, 2025a), including details the proposed methods. The drilling will be rotary rather than percussive, which produces less noise and vibration. The drilling rigs will be located at the drilling compounds, located approximately 280 m of Westfield Pill at the closest point.
- 1.3.6 The open cut cable excavation and installation then returns to the highway and continues along the A477 before heading East down the St Mary's Park access towards the existing NGED Milford Haven Substation. Construction works are estimated to take place between March 2026 and April 2027.
- 1.3.7 Key construction activities include, compound and welfare establishment, deliveries, excavation of cable trenches, cable ducting and installation, backfilling and reinstatement, cable jointing and HDD.
- 1.3.8 The proposed core working hours are:
- Monday to Friday 08:00-18:00
 - Saturdays 08:00-13:00

Construction Environment Management Plan

- 1.3.9 A Construction Environment Management Plan (CEMP) has been produced for the proposed development (National Grid, 2025a). The CEMP includes details of measures which will be implemented to minimise potential effects on ecological receptors, those of relevance to this assessment are summarised below.
- 1.3.10 Measures to control noise and vibration:
- Contractors shall control noise on the working areas in accordance with BS 5228, Noise Control on Construction and Open Sites, implementing Best Practical Means (BPM) in control of noise. Where works are required to take place outside of core hours or are in close proximity to sensitive receptors, the local planning authority will be consulted.

- All plant, equipment and noise control measures applied to plant and equipment shall be maintained in good working order and operated such that noise emissions are minimised as far as reasonably practicable;
- Where vehicle reversing alarms are required, they should be designed to cause the lowest practical environmental impact; preferably they should be directional broadband noise emitters or automatically adjusted to ambient noise levels.
- All employees shall be provided with an appropriate induction and ongoing briefings regarding the management of environmental issues. This will involve emphasising the need for employees to show consideration to the sensitive receptors.
- Machines and vehicles in intermittent use will be shut down during periods between works.
- No radios/stereos (site or vehicle based) will be used on the site.
- Limit operation times to agreed working hours;
- Ensure all ancillary pneumatic percussive tools are fitted with mufflers or silencers of the type recommended by the manufacturers;
- Ensure subcontractors properly maintain and operate all plant according to manufacturer's recommendations so as to avoid causing excessive noise;
- Place vibrating equipment or plant on a base separate to that on which any sensitive structure is located to reduce vibration impacts;
- Take care when unloading vehicles to minimise noise; and
- Regularly monitor both on and off site to ensure minimal noise and vibration impacts upon local wildlife.

1.3.11 Measures require to control impacts of visual and lighting disturbance:

- No permanent site lighting will be required. Should temporary lighting be required during construction, it will be positioned sensitively and directed downwards to minimise impacts of light pollution on wildlife. Such lighting will be switched off or its use minimised during periods of site inactivity.

1.3.12 Measures to protect water quality:

- Spill kits.
- Silt fencing to provide a barrier to protect sensitive receptors such as adjacent watercourses.
- Buffer strips of retained areas of vegetation between the work site and sensitive receptors, to allow natural drainage and protection.
- Silt bags and filters for water to be pumped into, during dewatering operations.
- Settlement tanks that allow silt-laden water to be pumped through at controlled rates, to allow settlement and discharge of clear water downstream.
- No discharges shall be made to ground or watercourses without the prior consent of NRW.
- A "permit to pump" system for dewatering of excavations shall be implemented to ensure that no unauthorised pumping occurs. If any dewatering under permit is required, details shall be agreed with NRW.
- Daily visual inspections of all watercourses, drainage outfalls and pumping activities, particularly during periods of inclement weather.

1.3.13 Measures to protect air quality:

- operation of construction plant in accordance with the manufacturer's written recommendations;

- vehicles and plant will be switched off and secured when not in use;
- vehicle and construction plant exhausts to be directed away from the ground and positioned at a height to facilitate appropriate dispersal of exhaust emissions;
- the enclosure, shielding or provision of filters on plant likely to generate excessive quantities of dust beyond the site boundaries; devices such as dust extractors, filters and collectors on drilling rigs and silos will be used;
- movement of construction traffic around the site will be kept to the minimum reasonable for the effective and efficient operation of the site and construction of the project;
- construction plant will be located away from site boundaries which are close to sensitive receptors, where reasonable and practicable;
- site access points will be designed to minimise queuing traffic adjacent to access points;
- cutting and grinding operations will be conducted using equipment and techniques which reduce emissions and incorporate appropriate dust suppression measures;
- damping down of dust-generating equipment and vehicles within the site and the provision of dust suppression in all areas of the site that are likely to generate dust;
- measures to keep roads and accesses clean;
- dampen down haul roads, as necessary, to reduce dust emissions; and
- seed / seal soil stockpiles to reduce the risk of dust migration.

1.3.14 Measures to prevent spread of invasive non-native species:

- A toolbox talk will be given to brief all staff undertaking the works, which will provide contactors with information to aid in the identification of invasive species, where to be particularly vigilant of their possible presence; and what to do if any are found during works.
- The CEMP includes details of 'Ecological discovery or damage' incident response procedure; stop works, report to GRD Environment lead, ecologist to assess and advise on how to proceed.
- If an invasive non-native species were to be encountered, the contractor will implement a 7m buffer around any identified species. Should avoidance not be possible the removal will be undertaken by an experienced contractor to prevent its spread within the site and to third-party land.

Operational phase

- 1.3.15 During operation the 132kV cable will be situated below ground, or within ducting. No permanent lighting is required and no regular maintenance is proposed; however, in the unlikely event of a fault, National Grid will respond in line with National Grid Energy Distribution (NGED) technical standards, which provide nationwide protocols for emergency repair works. National Grid will operate under its powers as a statutory operator, under powers provided by the Electricity Act 1989.
- 1.3.16 The cable is designed to be operational for 50 years, at which point the cable will be removed and replaced via the joint bays.

1.4 Overview of baseline ecological conditions

- 1.4.1 The proposed development is located primarily within highway and adjacent verge comprising species-poor grassland with limited forbs present. The HDD launch and

reception sites predominantly comprises arable fields, with small blocks of broadleaved woodland and hedges on the field margins. Whilst no trees are expected to be removed for the proposed works, works could be located in proximity to existing trees.

2 Methodology

2.1 HRA stages

2.1.1 The aim of a HRA is to determine, in view of a European site's conservation objectives and qualifying features, whether a project (either alone and/or in combination), would have a significant adverse effect on the European site. The stages of the HRA process are summarised below:

- Stage 1 Screening: This is the first stage of the process and identifies the likely impacts on a European site of a plan or project (either alone or in-combination). Note that at the screening stage only standard mitigation measures can be taken into consideration (refer to Section 2.4). If the screening exercise concludes that likely significant effects cannot be ruled out, then Appropriate Assessment (stage 2 of the process) must be undertaken.
- Stage 2 Appropriate Assessment (the integrity test): Assesses the potential impacts of the plan or project on the conservation objectives of the European sites (alone and in-combination). At this stage, it needs to be determined, beyond reasonable scientific doubt, whether or not there will be adverse effects on the integrity of the site. This stage also includes the development of mitigation measures to avoid or reduce any possible impacts (where necessary).
- Stage 3 Derogations: If a plan or project failed the integrity test (Stage 2 above), a plan or project could still go ahead (a HRA derogation be granted) if it passes all three of the following legal tests:
 - Test 1 Consideration of alternative solutions: This is the process which examines alternative ways of achieving the objectives of the plan or project that would avoid adverse impacts on the integrity of a European site.
 - Test 2 Consideration of imperative reasons of overriding public interest (IROPI): An assessment is made as to whether or not the development is necessary for IROPI.
 - Test 3 Securing compensation measures: If there are no feasible alternative solutions and it has been demonstrated that there are IROPI for the plan or project to go ahead, the final test involves a detailed assessment of the compensatory measures which will be required to fully offset the damage which will or could be caused to the European site.

2.2 HRA guidance

2.2.1 This screening report has been undertaken in accordance with the following guidance:

- European Commission, Directorate-General for Environment, Assessment of plans and projects significantly affecting Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC – November 2001, Publications Office, 2002.
- European Commission, Directorate-General for Environment, Guidance document on assessment of plans and projects in relation to Natura 2000 sites – A summary, Publications Office of the European Union, 2022.
- UK Government. Habitats regulations assessments: protecting a European site. How a competent authority must decide if a plan or project proposal that affects a

European site can go ahead. Published 24th February 2021. Last updated 6th December 2023. <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site>

2.3 In-combination effects

- 2.3.1 The Habitats Regulations require that the assessment takes into consideration whether a project in-combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

2.4 Mitigation

- 2.4.1 Mitigation measures which are specifically intended to avoid/reduce harmful effects of the project on European sites, cannot be taken into consideration at the screening stage (as per the 'People over Wind' judgement (case C-323/17) in 2018).
- 2.4.2 Following the 'Eco Advocacy CLG judgement' (case C-721/21) in 2023, measures that may mitigate a harmful effect on a European site can be taken into account at the screening stage, where those measures would have been incorporated into the project design as standard features, irrespective of any effect on the site concerned. This includes measures that will be undertaken to meet other existing legislative requirements, and/or measures that are considered to be standard practices used to manage commonly occurring environmental effects. These mitigation measures can be taken into consideration in the stage 1 screening assessment in Section 3.

3 HRA Screening

3.1 Introduction

3.1.1 Screening is stage 1 of the HRA process, which addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) of the Habitats Regulations, that is:

- whether a plan or project is directly connected to or necessary for the management of the site; and
- whether a plan or project, alone or in-combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

3.1.2 The purpose of the proposed development is not directly connected with or necessary to the management of a European site; therefore, the second test needs to be undertaken to determine whether the proposed development has the potential to have likely significant effects on a European site.

3.2 Identification of European sites

3.2.1 The zone of influence (Zoi) of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have likely significant effects on the qualifying features of a European site. A Zoi of 10 km from the proposed development has been used to identify European sites potentially impacted by the proposed development. These are summarised in Table 1 and shown on Figure 2.

3.2.2 Table 1 provides a list of the qualifying features for each of the European sites, as well as identified threats and pressures.

Table 1: European sites within 10km of the Site.

Site Name	Distance (m) and direction from Site	Designated features	Threats/ Pressures
Pembrokeshire Marine/Sir Benfro Forol SAC	Within site	▪ Subtidal sandbanks ▪ Estuaries ▪ Intertidal mudflats and sandflats ▪ Coastal lagoons ▪ Shallow inlets and bays ▪ Reefs ▪ Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) ▪ Sea caves ▪ Sea lamprey (<i>Petromyzon marinus</i>)	▪ Exploration and extraction of oil or gas ▪ Shipping lanes, ports, marine constructions ▪ Fishing and harvesting aquatic resources ▪ Hunting, fishing or collecting activities not referred to above ▪ Outdoor sports and leisure activities, recreational activities ▪ Other human intrusions and disturbances

Site Name	Distance (m) and direction from Site	Designated features	Threats/ Pressures
		- River lamprey (<i>Lampetra fluviatilis</i>) - Allis shad (<i>Alosa alosa</i>) - Twaite shad (<i>Alosa fallax</i>) - Bottlenose dolphin (<i>Tursiops truncatus</i>) - Harbour porpoise (<i>Phocoena phocoena</i>) - Otter (<i>Lutra lutra</i>) - Grey seal (<i>Halichoerus grypus</i>) - Shore dock (<i>Rumex rupestris</i>)	- Pollution to surface waters (limnic & terrestrial, marine & brackish) - Marine water pollution - Air pollution, air-borne pollutants - Invasive non-native species - Human induced changes in hydraulic conditions - Abiotic (slow) natural processes - Changes in abiotic conditions
Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC	4465m East	- Calcium-rich nutrient-poor lakes, lochs and pools - Dry grasslands and scrublands on chalk or limestone - Bullhead (<i>Cottus gobio</i>) - Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) - Greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>) - Otter (<i>Lutra lutra</i>)	- Forest and Plantation management & use - Other urbanisation, industrial and similar activities - Pollution to surface waters (limnic & terrestrial, marine & brackish) - Pollution to groundwater (point sources and diffuse sources) - Air pollution, air-borne pollutants - Human induced changes in hydraulic conditions
Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC	5455m South East	Harbour porpoise (<i>Phocoena phocoena</i>)	- Exploration and extraction of oil or gas - Renewable abiotic energy use - Shipping lanes, ports, marine constructions - Fishing and harvesting aquatic resources - Military use and civil unrest - Marine water pollution - Other ecosystem modifications

Site Name	Distance (m) and direction from Site	Designated features	Threats/ Pressures
Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC	6330m South West	- Intertidal mudflats and sandflats - Vegetated sea cliffs - Shifting dunes - Shifting dunes along the shoreline with Marram (<i>Ammophila arenaria</i>) ("white dunes") - Dune grassland - Humid dune slacks - Dry heaths - Dry grasslands and scrublands on chalk or limestone - Caves not open to the public - Sea caves - Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) - Greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>) - Otter (<i>Lutra lutra</i>) - Grey seal (<i>Halichoerus grypus</i>) - Petalwort (<i>Petalophyllum ralfsii</i>) - Early gentian (<i>Gentianella anglica</i>)	- Grazing - Outdoor sports and leisure activities, recreational activities - Air pollution, air-borne pollutants - Invasive non-native species - Fire and fire suppression - Biocenotic evolution, succession - Changes in abiotic conditions
Castlemartin Coast SPA	7060m South West	Breeding Red-billed chough (<i>Pyrrhocorax pyrrhocorax</i>)	Use of biocides, hormones and chemicals
Afonydd Cleddau / Cleddau Rivers SAC	7140m North East	- Rivers with floating vegetation often dominated by water-crowfoot - Active raised bogs - Degraded raised bog - Alder woodland on floodplains	- Grazing - Pollution to surface waters (limnic & terrestrial, marine & brackish) - Air pollution, air-borne pollutants - Invasive non-native species

Site Name	Distance (m) and direction from Site	Designated features	Threats/ Pressures
		- Sea lamprey (<i>Petromyzon marinus</i>) - Brook lamprey (<i>Lampetra planeri</i>) - River lamprey (<i>Lampetra fluviatilis</i>) - Allis shad (<i>Alosa alosa</i>) - Atlantic salmon (<i>Salmo salar</i>) - Bullhead (<i>Cottus gobio</i>) - Otter (<i>Lutra lutra</i>)	- human induced changes in hydraulic conditions - Other ecosystem modifications - Interspecific floral relations - Changes in abiotic conditions
Skomer, Skokholm and the Seas off Pembrokeshire SPA	7320m West	- Breeding Manx shearwater (<i>Puffinus puffinus</i>) - Breeding European storm-petrel (<i>Hydrobates pelagicus</i>) - Breeding Lesser black-backed gull (<i>Larus fuscus</i>) - Breeding Atlantic puffin (<i>Fratercula arctica</i>) - Breeding Short-eared owl (<i>Asio flammeus</i>) - Breeding Red-billed chough (<i>Pyrrhocorax pyrrhocorax</i>)	- Exploration and extraction of oil or gas - Renewable abiotic energy use - Shipping lanes, ports, marine constructions - Fishing and harvesting aquatic resources - Hunting and collection of wild animals (terrestrial) - Outdoor sports and leisure activities, recreational activities - Marine water pollution - Other ecosystem modifications - Interspecific faunal relations - Threats and pressures from outside the EU territory
Yerbeston Tops SAC	8660m North East	- Purple moor-grass (<i>Mollinia caerulea</i>) meadows - Marsh fritillary butterfly (<i>Euphydryas</i> (<i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i>)	- Grazing - Air pollution, air-borne pollutants - Other ecosystem modifications - Biocenotic evolution, succession
West Wales Marine / Gorllewin Cymru Forol SAC	9275m West	Harbour porpoise (<i>Phocoena phocoena</i>)	- Exploration and extraction of oil or gas - Renewable abiotic energy use

Site Name	Distance (m) and direction from Site	Designated features	Threats/ Pressures
			- Shipping lanes, ports, marine constructions - Fishing and harvesting aquatic resources - Military use and civil unrest - Marine water pollution

3.3 Source-Pathway-Receptor

- 3.3.1 Likely significant effects on a European site will only exist where there is a source-pathway-receptor link.
- 3.3.2 The proposed development would be the source/cause of the effects (if any) on the European site. Identifying potential impact pathways to qualifying features of the European sites (receptors) is part of the screening process. If there is no link or causal connection between the actions likely to result from the proposed development and the qualifying features of any European sites, there is no potential for impacts and likely significant effect can be screened out.
- 3.3.3 Taking into consideration the development proposals (refer to Section 1.3), the potential impact pathways (to qualifying habitats and/or species associated with the European sites) have been identified during the construction and operational phases. These are summarised in Table 2.

Table 2: Potential impacts of the proposed development, and zones of influence

Potential impact pathway	Description	Zone of Influence
Construction phase		
Noise and vibration disturbance	Disturbance of qualifying species of the European sites could occur as a result of construction noise/vibration, including from HDD, and/or increased human presence.	Noise and vibration is considered unlikely to impact qualifying species over 500m from the proposed development.
Visual disturbance	The presence of workers, plant, or lighting has the potential to cause visual disturbance of qualifying species.	Visual disturbance is considered unlikely to impact qualifying species over 500m from the proposed development.
Changes in water quality	There is potential for changes in water quality, for example from surface water run-off, dewatering from site, and potential bentonite release. This has the potential to impact qualifying habitats and species of the European sites.	Changes in water quality have the potential to effect qualifying features downstream of the proposed development, within the water catchment area.
Changes in air quality	There is potential for changes in air quality, for example as a result of road traffic emissions, exhaust emissions from equipment and machinery, dust and fine particulate matter.	Changes in air quality have the potential to effect qualifying features within 200m from any consistently used worksite or access road.

Potential impact pathway	Description	Zone of Influence
	There is potential for impacts on plants and habitats which are qualifying features of European sites.	
Spread of invasive non-native species	There is potential for the proposed works to result in the spread of terrestrial invasive non-native species. This has the potential for impacts on qualifying habitats and species of European sites.	If present, terrestrial invasive non-native species could be spread within the working area.
Operational phase		
Disturbance from electromagnetic fields	Electromagnetic fields from buried cables have the potential to disturb aquatic species which are qualifying features of European sites, for example through changes in behaviour, or the development of fish eggs and fry.	Electromagnetic fields have the potential to effect qualifying aquatic species above/adjacent to the proposed cable route under Westfield Pill.

3.4 Screening assessment

- 3.4.1 Based on the potential impact pathways and associated Zols described in Table 2 above, all of the European sites identified in Table 1, with the exception of Pembrokeshire Marine/Sir Benfro Forol SAC, have been scoped out of the screening assessment. The screening assessment for the Pembrokeshire Marine/Sir Benfro Forol SAC is presented below.

Pembrokeshire Marine/Sir Benfro Forol SAC

- 3.4.2 The designated features for Pembrokeshire Marine/Sir Benfro Forol SAC are listed in Table 1, and are described in detail in Appendix A. The SAC is underpinned by Milford Haven Waterway SSSI, which comprise 11 component areas. The component areas that are within the Zol are The Daugleddau and Cosheston Pill. The conservation objectives for the SAC seek to maintain (or restore) the habitat and species features, as a whole, at (or to) favourable conservation status (FCS) within the site (Cyfoeth Naturiol Cymru Natural Resources Wales, 2018).
- 3.4.3 Table 3 below shows the screening assessment of potential impacts in relation to the qualifying features of the Pembrokeshire Marine/Sir Benfro Forol SAC.

Table 3: Screening assessment for Pembrokeshire Marine / Sir Benfro Forol SAC

Potential impact pathway	Screening assessment	Screening conclusion
Construction phase		
Noise and vibration disturbance	Noise and vibration during construction is unlikely to impact receptors over 500m from the proposed development. Bottlenose dolphin, harbour porpoise and grey seal, are largely associated with the marine and coastal habitats of the SAC, and are unlikely to be found in the vicinity of the proposed works. As such, potential for likely significant effects (alone and in-combination) for these species can be ruled out in relation to noise and vibration.	Screened out (alone and in-combination): bottlenose dolphin, harbour porpoise and grey seal. Screened in (alone and in-

Potential impact pathway	Screening assessment	Screening conclusion
Construction phase		
	There is potential for disturbance of sea and river lamprey, allis and twaite shad, and otter which may be present in the vicinity of the works. Potential for likely significant effects cannot be ruled out and therefore Appropriate Assessment (alone and in-combination) of this impact will be required for these qualifying species.	combination): sea and river lamprey, allis and twaite shad, and otter.
Visual disturbance	Visual disturbance from construction activities and/or lighting could extend up to 500m from the proposed development. As noted above, bottlenose dolphin, harbour porpoise and grey seal, are unlikely to be found in the vicinity of the proposed works. Visual disturbance is also unlikely to affect the qualifying fish species. As such, potential for likely significant effects (alone and in-combination) for these species can be ruled out in relation to visual disturbance. There is potential for visual disturbance of otters, which may be present in the vicinity of the works. Potential for likely significant effects cannot be ruled out and therefore Appropriate Assessment (alone and in-combination) of this impact will be required for this species.	Screened out (alone and in-combination): bottlenose dolphin, harbour porpoise and grey seal, river lamprey, allis shad and twaite shad. Screened in (alone and in-combination): otter
Changes in water quality	There is potential for changes in water quality downstream of the proposed works, with the potential for adverse effects where they are in close proximity to the SAC, or waterbodies which are hydrologically linked to the SAC. The CEMP (National Grid, 2025a) (refer to section 1.3) includes standard water quality protection measures which will be implemented site wide. This includes measures to control surface water run-off, ensure safe storage of materials, details of spill and incident response procedures, and pumping permits to ensure appropriate sediment control measures. HDD uses pressurised liquid bentonite as a lubricant during the drilling, which may break out through the soil during the drill. The bentonite is inert, and at a 15-20m depth, it is unlikely to reach the surface and enter the watercourse. Measures to prevent bentonite breakouts are outlined in a Break-out Contingency Plan (OCU, 2025b), including measures to contain and control breakouts in the unlikely event that they occur. With these measures in place, potential for likely significant effects (alone and in-combination) as a result of changes in water quality on qualifying features of the SAC can be ruled out in relation to noise and vibration.	Screened out (alone and in-combination)
Changes in air quality	Changes in air quality are considered unlikely to extend more than 200m from any consistently used worksite or access road. As noted in the CEMP (National Grid, 2025a) (refer to section 1.3), due to the limited amount of dust generating activities and the short duration of works, the potential dust and air quality impacts from the works are considered to be low. The CEMP includes details of standard measures that will be implemented to control dust for the duration of the works. In addition, qualifying habitats and species which could be sensitive to changes in air quality are unlikely to be found in the vicinity of the proposed works.	Screened out (alone and in-combination)

Potential impact pathway	Screening assessment	Screening conclusion
Construction phase		
	Therefore, the potential for likely significant effects (alone and in-combination) can be ruled out and Appropriate Assessment of this impact will not be required.	
Spread of invasive non-native species	Japanese Knotweed (<i>Reynoutria japonica</i>) was identified in one location along the boundary of a field where the HDD launch pit would be located. The proposed working area within the field containing Japanese Knotweed is over 25 m from the closest stand of Japanese Knotweed. The CEMP (National Grid, 2025a) (refer to Section 1.3 above) provides details of the standard measures which will be implemented site-wide during the construction phase to prevent the spread of invasive non-native species and/or procedures which would be followed should a non-native species be identified. With these measures in place, it is considered unlikely that construction works will spread invasive non-native species. The potential for likely significant effects (alone and in-combination) can be ruled out and therefore Appropriate Assessment of this impact will not be required.	Screened out (alone and in-combination)
Operational phase		
Disturbance from Electromagnetic fields (EMF)	Underground high voltage cables will be installed under Westfield Pill. There is potential for effects on qualifying aquatic species from EMF. As noted above, bottlenose dolphin, harbour porpoise and grey seal, are associated with the marine and coastal habitats of the SAC, and are unlikely to be found in the vicinity of the proposed HDD works. As such, potential for likely significant effects (alone and in-combination) for these species can be ruled out in relation to EMF. There is potential for disturbance from EMF of sea and river lamprey, allis and twaite shad, and otter which may use Westfield Pill. Potential for likely significant effects cannot be ruled out and therefore Appropriate Assessment (alone and in-combination) of this impact will be required for these qualifying species.	Screened out (alone and in-combination): for bottlenose dolphin, harbour porpoise and grey seal. Screened in (alone and in-combination): for sea and river lamprey, allis and twaite shad, and otter.

3.5 Screening conclusion

3.5.1 On completion of the screening assessment, it has been concluded that the potential for likely significant effects cannot be ruled out at this stage of the assessment (either alone or in-combination) for the Pembrokeshire Marine/Sir Benfro Forol SAC in relation to:

- Construction phase:
 - Noise and vibration disturbance (sea and river lamprey, allis and twaite shad, and otter)
 - Visual disturbance (otter)
- Operational phase:
 - EMF (sea and river lamprey, allis and twaite shad, and otter)

3.5.2 Stage 2 (Appropriate Assessment) of the HRA process is therefore required.

4 Appropriate Assessment (alone)

4.1 Introduction

- 4.1.1 Sections 4 and 5 comprise stage 2 of the HRA process, Appropriate Assessment. The assessment below will determine whether there is potential for adverse effects on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC, as a result of the proposed development (alone and in-combination).

4.2 Noise and vibration disturbance

- 4.2.1 There is potential for disturbance of otter and fish species which are qualifying features of the SAC from noise and vibration during the construction phase. The Zol of noise and vibration is considered likely to extend up to 500m. Three sections of the proposed route are within 500m of the Pembrokeshire Marine/Sir Benfro Forol SAC:
- the A477 adjacent to Cosheston Pill (to the south-east of the route);
 - the Cleddau Bridge; and
 - the HDD crossing of the Westfield Pill.
- 4.2.2 The sections of the route close to Cosheston Pill and Cleddau Bridge are both along the A477, an existing road with a substantial level of background noise, especially during working hours. Due to the nature of the installation under the Cleddau Bridge (via an existing services structure beneath the bridge), disturbance of fish and otters is considered unlikely. Where the works would take place near Cosheston Pill, this represents a very small area of the SAC and otters using habitats in the vicinity are likely to be habituated to the existing levels noise.
- 4.2.3 In relation to Westfield Pill, the route diverts from the A477 to the HDD compounds either side of the waterbody (refer to the HDD feasibility report (OCU Group, 2025a) for full details of the proposed HDD method). The drilling is proposed to be 15-20 m below the surface of the river bed, which would reduce potential impacts on fish from vibrations. In addition, the drilling will be rotary rather than percussive, which produces less noise and vibration. The drilling rig would be located at the drilling compounds, approximately 280 m west of Westfield Pill. The habitats surrounding the rig are neutral grassland and the SAC and Westfield Pill are screened by broadleaved woodland, and are downhill of the drilling rigs, by approximately 30 m (measured vertically). As such, disturbance of fish and otter within Westfield Pill is considered unlikely.
- 4.2.4 In addition to the above, the CEMP (National Grid 2025a) (refer to section 1.3) provides measures to minimise noise and vibration during construction.
- 4.2.5 Therefore, there would be no adverse effects on the integrity of the populations of otter or fish species associated with the Pembrokeshire Marine/Sir Benfro Forol SAC in relation to disturbance from noise and vibration.

4.3 Visual disturbance

- 4.3.1 There is potential for visual disturbance of otters from construction activities and/or lighting. The Zol for visual disturbance is considered likely to be up to 500 m, which

excludes the majority of the SAC. Three sections of the proposed route are within 500 m of the Pembrokeshire Marine/Sir Benfro Forol SAC:

- the A477 adjacent to Cosheston Pill;
- the Cleddau Bridge; and
- the HDD crossing of the Westfield Pill.

4.3.2 The sections of the route in close proximity to Cosheston Pill and the Cleddau Bridge are both along the A477. There is existing visual disturbance from vehicles and lighting along this stretch of the road. The send and receive pits associated with the HDD crossing will be located at least 280 m from the SAC, and are also screened by woodland and the slope of the land.

4.3.3 The proposed construction works are temporary in nature, and as set out in the CEMP National Grid, 2025a) (refer to Section 1.3 above) most works will be undertaken during the core daytime hours of 08:00-18:00. Should temporary lighting be required during construction, it will be positioned sensitively and directed downwards to minimise impacts of light pollution on wildlife.

4.3.4 Therefore, there would be no adverse effects on the integrity of the population of otters associated with the Pembrokeshire Marine/Sir Benfro Forol SAC in relation to visual disturbance.

4.4 Electromagnetic fields

4.4.1 There is potential for disturbance of otter and fish species which are qualifying features of the SAC from EMF during the operational phase. The Zol of EMF is considered to be adjacent to the proposed cable route under Westfield Pill. Electromagnetic fields from buried cables have the potential to disturb fish and otters through changes in behaviour.

Electric fields

4.4.2 The cable will have an insulating layer, which would eliminate the electric field (National Grid 2015). Furthermore, burying the cable 15-20m below the river bed would further ensure the electric field does not reach the water column. Therefore, there would be no potential adverse effects on qualifying species of the SAC from electric fields.

Magnetic fields

4.4.3 Magnetic fields occur naturally; the Earth's magnetic field, which is caused mainly by currents circulating in the outer layer of the Earth's core, is approximately 50 microTeslas (μT) in the UK. Unlike electric fields, the magnetic field produced by an underground cable is not shielded by the cable insulation and can move through substrates, extending directly above the cable and to either side, with the strongest magnetic field detected directly above the cable location (Energy networks association, 2017). Increasing the separation distance between the source of the magnetic field (the cable) and potential receptors is recognised as an important way of minimising potential impacts (OES Environmental Tethys Management Measures Tool for Marine Energy, 2025), with a recommendation to bury cables at a minimum depth of 1m to minimise potential effects from magnetic fields. The cables for the proposed development will be between 15-20 m below the river bed; much greater than the minimum recommend depth of 1 m.

- 4.4.4 Table 4 below shows typical magnetic fields (from National Grid monitoring and the Hinkley Connection project) generated from different cable types, compared with natural background levels. National Grid guidance notes that cables are typically installed 1 m below ground (National Grid, 2015).

Table 4: Typical sources of magnetic radiation

Source of magnetic field		Magnetic Field (microTeslas μ T)
Government Guidelines – maximum permitted (Permitted Public Exposure Limit - ICNIRP 1998 exposure limits in the terms of the 1999 EU Recommendation)*		360
Natural background levels of the earth (UK)*		50
TV, washing machine, microwave*	Close to appliance	50
	1m away	0.2
Typical 400kv underground cable, buried at 0.9m depth**	At cable (0m from centreline)	24
	5m from centre line	3
	10m from centre line	0.9
Typical 400kv underground cable, buried at 25m depth**	At cable (0m from centreline)	0.03
	5m from centre line	0.03
	10m from centre line	0.02
Typical 132kV underground cable (buried at 1m)***	Normal conditions	4.1
	Maximum capacity	54
* (Energy networks association, 2017)		
** (National Grid, 2015)		
*** (National Grid, 2020)		

- 4.4.5 This shows that directly above the cable (where the magnetic field generated is greatest), the level of magnetic field is typically approximately 24 μ T for a 400kV cable and 4.1 μ T for a 132kV underground cable (under normal conditions). Both of these magnetic fields are far less than natural background levels.
- 4.4.6 As the 132 kV cables for the proposed development will be buried at 15-20m, and that magnetic field is known to reduce with separation distance, it can reasonably be assumed that the resultant magnetic field would be less than natural background levels.
- 4.4.7 Therefore, there would be no adverse effects on the integrity of the populations of otters and fish species associated with the Pembrokeshire Marine/Sir Benfro Forol SAC in relation to EMF.

4.5 Appropriate Assessment conclusion (alone)

- 4.5.1 This Appropriate Assessment has considered the potential for adverse effects as a result of the proposed development in relation to noise and vibration disturbance, visual disturbance and EMF. The assessment determined that there would be no adverse impacts (alone) on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of the proposed development.

5 Appropriate Assessment (in-combination)

- 5.1.1 The assessment has considered the potential for in-combination effects with the recent applications and ongoing or recently completed developments detailed in Table .

Table 5: Other recent projects identified from within 1 km of both the Pembrokeshire Marine/Sir Benfro Forol SAC and the cable route.

Overview	Application reference number/s
A recently approved solar farm at the other side of Cosheston Pill, West Farm, Cosheston, SA72 4UN.	23/0701/PA
Environmental Impact Assessment (EIA) screening for the proposed upgrade of a quay in connection with offshore wind, Criterion Quay, at the Eastern end of Pembroke Dock.	23/0498/SC
Repair/replacement work of a 'Dolphin U' structure at Pembroke Dock Ferry Terminal, south-east of Cleddau Bridge, within the Milford Haven Waterway.	NP/23/0003/OBS
Three other relatively recent planning applications/variations in conditions that all relate to the Marine Energy Test Area (META) project — a series of test areas in the Milford Haven Waterway that are suitable for testing marine renewable energy devices and component testing. All relate to the original marine licence ORML1927, awarded in 2018, and/or the second marine licence (ORML1957v1). Variations to consents include increasing the area, speed and number of rotors.	20/0756/PA 21/1153/PA NP/22/0218/OBS NP/21/0075/OBS NP/22/0174/OBS

- 5.1.2 Based on the assessment presented in Section 4 for the proposed development (which concluded no adverse effects on integrity of the SAC alone) and the requirement for the other existing and/or approved developments to implement mitigation (where appropriate), it can be concluded that there would be no adverse in-combination effects on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC.

6 Conclusion

- 6.1.1 Taking into consideration the likely zone of influence for each potential impact pathway, only the closest European site, Pembrokeshire Marine/Sir Benfro Forol SAC, was scoped into the screening assessment.
- 6.1.2 On completion of the Stage 1 screening assessment, it was concluded that the potential for likely significant effects could not be ruled out (either alone or in combination) for the Pembrokeshire Marine/Sir Benfro Forol SAC in relation to:
 - Construction phase:
 - Noise and vibration disturbance (sea and river lamprey, allis and twaite shad, and otter)
 - Visual disturbance (otter)
 - Operational phase:
 - EMF (sea and river lamprey, allis and twaite shad, and otter)
- 6.1.3 Stage 2 Appropriate Assessment of the Habitats Regulations Assessment process was therefore required for these impacts.
- 6.1.4 The Stage 2 Appropriate Assessment concluded that there would be no adverse impacts (alone or in combination) on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of the proposed development.

7 References

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OES Environmental Tethys Management Measures Tool for Marine Energy (2025). [Accessed online 03/07/25] website: <https://tethys.pnnl.gov/management-measures#:~:text=The%20Management%20Measures%20Tool%20for,a%20risk%20can%20be%20retired.>

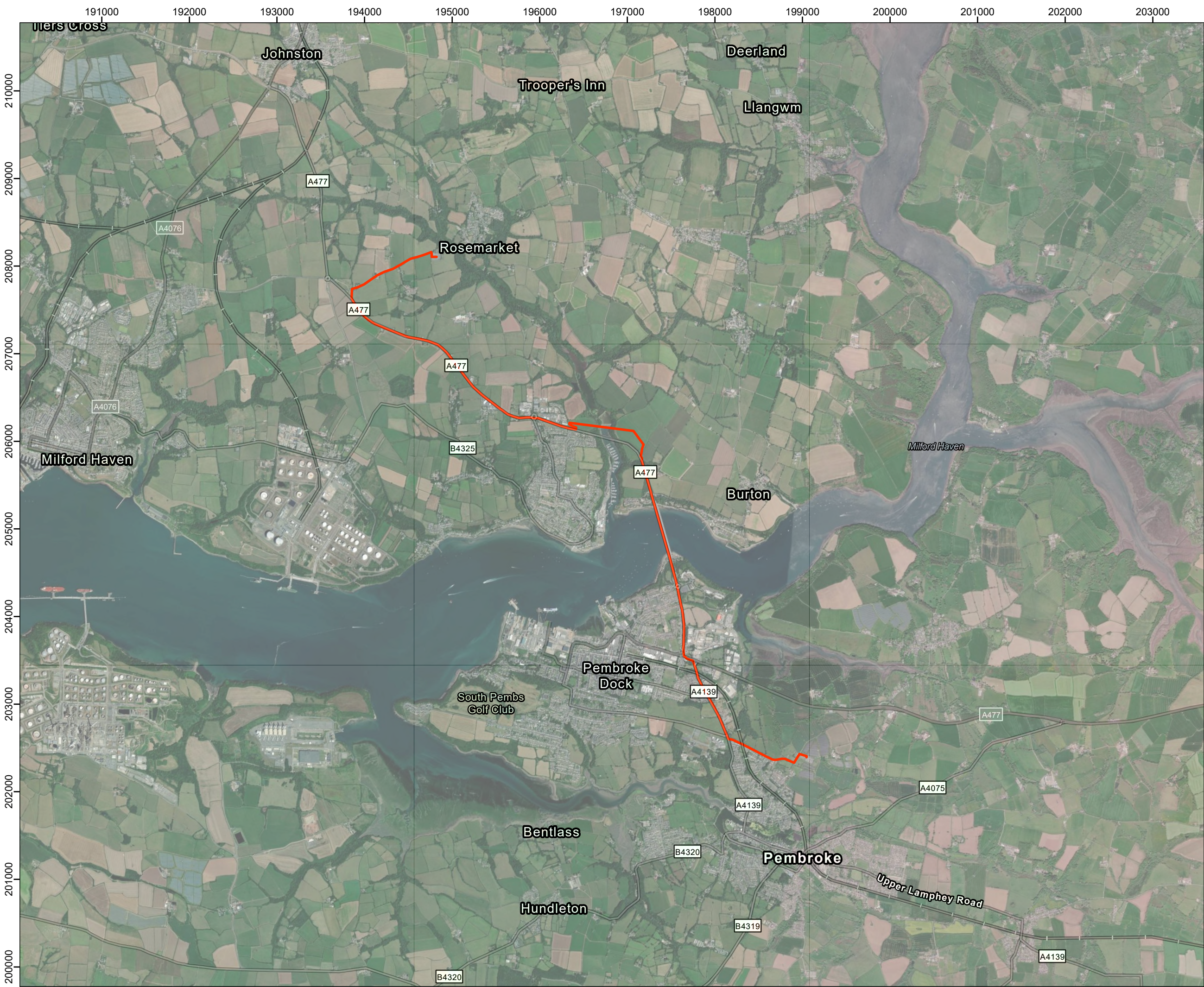
OCU (on behalf of National Grid Electricity Distribution) (2025a), Feasibility Report — Pembroke 132kv Reinforcement HDD Feasibility Study. Revision 01.

OCU (on behalf of National Grid Electricity Distribution) (2025b) Break out contingency plan (undated)

Figures

Figure 1: Site location plan

Figure 2: European designated sites



Legend:
Cable route

00	26/11/2025	2488549	LB	HD	RF
Rev	Date	Project Code	Drn	Chk	App

Pembroke 132kV Reinforcement

EXPERTS IN ECOLOGY

TITLE: Figure 1:
Site Location Plan

SCALE: 1:40,000 @ A3

REV 00



Appendix A - Pembrokeshire Marine/Sir Benfro Forol SAC

Designated Features¹

Annex I habitats that are a primary reason for selection of this site

1130 Estuaries

Pembrokeshire Marine includes the Daugleddau estuary, a ria estuary in south-west Wales, formed in the upper reaches of one of the best examples of a ria in the UK. Associated with the wide range of environmental conditions, particularly seabed substrates, tidal streams and salinity gradients, there is a wide diversity of communities and species. The species-richness of sediment communities throughout Milford Haven and the Daugleddau is high. Tide-swept sponge communities on shell/cobble substrates and bedrock in the upper reaches of the Daugleddau are exceptional in their diversity. The site also includes smaller estuaries entering the Daugleddau and Milford Haven, and wide intertidal mudflats with rich and productive invertebrate annelid and mollusc communities, occurring in 'pills' (creeks).

1160 Large shallow inlets and bays

Pembrokeshire Marine in south-west Wales includes Milford Haven, one of the best examples of a ria in the UK, and the wide, shallow, predominantly sandy embayment of St Brides Bay. The wide range of environmental conditions, particularly seabed substrates, tidal streams and salinity gradients, supports high community and species diversity. The species-richness of sediment communities throughout Milford Haven is particularly high, with intertidal sandy/muddy areas supporting extensive beds of narrow-leaved eelgrass *Zostera angustifolia*. High-salinity water and rocky substrates penetrate far upstream, and communities characteristic of fully saline conditions occur. A wide range of subtidal and intertidal rocky habitats are present, from rocky reefs and boulders to rich underboulders, crevices, overhangs and pools.

1170 Reefs

Reefs in this south-west Wales site are largely composed of igneous rock but include areas of more friable Old Red Sandstone and some limestone. Extensive areas of sublittoral rocky reef stretch offshore from the west Pembrokeshire coast and between the Pembrokeshire islands and many small rocky islets. Limestone reefs occur in the south of the site. Reefs also extend through Milford Haven and into the variable salinity conditions of the Daugleddau estuary. Reefs within the site are subject to an exceptional variation in strength of tidal streams and wave exposure. The highly variable rocky seabed topography, together with the indented coastline and extreme tidal range, cause strong tidal streams, particularly around headlands, through sounds and in tidal inlets. The shallower and south-west-facing rocky reefs are exposed to severe wave action, while many others are extremely wave-sheltered. Many of the reefs extend onto the shore and provide examples of both the most exposed and the most sheltered intertidal rock communities in southern Britain. Reef habitat diversity is increased by caves, tunnels and surge gullies in both subtidal and intertidal zones. The wide variation in exposure to water movement, the range of rock type, slope, aspect and topography, and the high water quality, together with local exposure to abrasion from adjacent sediments and reduced salinity in the Daugleddau, are reflected in the wide diversity and

¹ JNCC (2025) SAC in the United Kingdom, Pembrokeshire Marine/ Sir Benfro Forol. Designated Special Area of Conservation (SAC) [accessed online 03/07/2025] website: <https://sac.jncc.gov.uk/site/UK0013116>

species abundance of biological communities. Offshore there are particularly extensive areas of tide-swept kelp and species-rich red algal populations and, across the large areas of deeper rock reef, a wide range and abundance of invertebrate animal communities, with hydroid, bryozoan, soft coral and anemone species. More sheltered reefs, including those in lowered salinity and higher turbidity, typically support diverse and species-rich sponge- and ascidian-dominated communities.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

1110 Sandbanks which are slightly covered by sea water all the time

1140 Mudflats and sandflats not covered by seawater at low tide

1150 Coastal lagoons * Priority feature

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

8330 Submerged or partially submerged sea caves

Annex II species that are a primary reason for selection of this site

1364 Grey seal *Halichoerus grypus*

Pembrokeshire in south-west Wales is representative of grey seal *Halichoerus grypus* colonies in the south-western part of the breeding range in the UK. It is the largest breeding colony on the west coast south of the Solway Firth, representing over 2% of annual UK pup production.

1441 Shore dock (*Rumex rupestris*)

Habitat occurrence description not yet available.

Annex II species present as a qualifying feature, but not a primary reason for site selection

1095 Sea lamprey (*Petromyzon marinus*)

1099 River lamprey (*Lampetra fluviatilis*)

1102 Allis shad (*Alosa alosa*)

1103 Twaite shad (*Alosa fallax*)

1355 Otter (*Lutra lutra*)



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