PEMBROKE DOCK INFRASTRUCTURE ENVIRONMENTAL STATEMENT: NON-TECHNICAL SUMMARY

On behalf of Milford Haven Port Authority

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GLOSSARY

Glossary		
	Meaning	Abbreviation
Articulated Wind Column		AWC
Assessment of the Significance of the Impact of the Development on the Historic Landscape		ASIDOHL
Business Register and Employment Survey		BRES
Code of Construction Practice		CoCP
Cumulative Impact Assessment		CIA
Draft National Development Framework		NDF
Environmental Impact Assessment		EIA
Economic Regeneration Strategy		ERS
Environmental Statement		ES
Full Business Case		FBC
Full Time Equivalent		FTE
Future Wales: Then National Plan	NDF renamed and updated	
Great Britain		GB
Gross Value Added	Gross Value Added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy	GVA
Homes and Communities Agency		HCA
Hardisty Jones Associates		HJA
Headquarters		HQ
Local Development Plan		LDP
Location Quotient	Location quotient (LQ) is a way of quantifying how concentrated a particular sector is in a specific area as compared to the national average. An LQ above 1 indicates an above average concentration, whilst an LQ below 1 indicates a below average concentration	LQ
Marine Energy Test Area		META
Marine Energy Wales		MEW
Milford Haven	The town of Milford Haven	
Milford Haven Port Authority	Milford Haven Port Authority is the statutory harbour authority for the Port of Milford Haven. It is a Trust Port and operates on a commercial basis, charging port fees for providing conservancy and pilotage services to the vessels delivering or collecting products at the principal terminals located on the Milford Haven Waterway. It also owns and operates a property portfolio at Milford Marina and Fish Docks and port facilities at Pembroke Dock.	MHPA
Milford Haven Waterway	The estuary of Milford Haven	MHW
Office for National Statistics		ONS
Outline Code of Construction Practice		OCoCP

Pembrokeshire County Council		PCC
Pembrokeshire Demonstration Zone		PDZ
Pembroke Dock	The town of Pembroke Dock	
Pembroke Dock Infrastructure	The proposed development at The Dockyard/Pembroke Port the majority of which is within the Application Site	PDI
Pembroke Dock Marine	A named project within the Swansea Bay City Deal made up of four sub-projects: Marine Energy Test Area; Marine Energy Engineering Centre of Excellence; Pembroke Dock Infrastructure; and Pembrokeshire Demonstration Zone	PDM
Pembrokeshire Economic Development Strategy Action Plan		PEDSAP
Pembroke Port	The port enterprise situated at the north western edge of Pembroke Dock, including the ferry terminal and all the non-property commercial activity within the dockyard on port owned land	
People, Places, Futures		PPF
Planning Policy Wales		PPW
Research and Development		R&D
Small and Medium size Enterprise		SME
Standard Occupational Classification	The standard occupational classification is a common classification of occupational information for the UK	SOC
Swansea Bay City Deal		SBCD
Swansea Bay City Region		SBCR
Technical Advice Note		TAN
The Dockyard	The area of Pembroke Port that is bounded, predominantly on three sides, by the dockyard walls	
The Application Site	The area of The Dockyard/Pembroke Port and shoreline within the planning application boundary	
United Kingdom		UK
Welsh Government		WG
Welsh National Marine Plan		WNMP

1 INTRODUCTION

1.1 Pembroke Port is located at the north-western edge of the town of Pembroke Dock in Pembrokeshire. The town of Pembroke Dock is located in the south of Pembrokeshire on the southern side of the Milford Haven Waterway. The Proposed Development site location is shown at **Figure 1**.

1.2 Taking into account the nature and scale of the development proposed, a process of Environmental Impact Assessment has been undertaken in accordance with UK legal requirements to identify the potential for significant environmental impacts to arise from the Proposed Development:

1.3 An Environmental Statement has been produced, setting out the findings of the assessment process. The Environmental Statement accompanies a planning application submitted to Pembrokeshire County Council (PCC). The ES will also accompany the associated Marine Licence application to the Natural Resources Wales Marine Licensing Team (NRW-MLT)

1.4 This document is the Non-Technical Summary of the Environmental Statement. This summary document provides an overview of the assessment findings. Details of how to view the full Environmental Statement or to obtain further copies of this Non-Technical Summary are provided at the end of this document.

2 PROJECT DESCRIPTION

The site and the surrounding area

2.1 To the north of the Port lies the Milford Haven Waterway. To the east lies Front Street and Commercial Row with a residential area and Pembroke Dock town centre beyond. To the south lies Fort Road and Meyrick Owen Way with South Pembrokeshire Hospital and commercial and residential properties beyond. To the west lies a sewage treatment work with the Milford Haven Waterway beyond.

2.2 Pembroke Port itself comprises a broadly rectangular area of approximately 33.25 ha (82.15 acres) enclosed on three sides by the Grade II listed dockyard walls. Since its construction in the 1810s, the development within the dockyard has consistently evolved to meet the needs of the marine industry it serves.

2.3 The Port contains a mixture of larger modern industrial and older, generally smaller industrial and ancillary office buildings, several of which are listed due to their architectural or historical (associated with the former Royal Naval Dockyard use of the site) value. Much of the remainder of the Port is covered in hardstanding with some small areas of land covered in grass or scrub vegetation. An Existing Site Plan is included as **Figure 2**.

2.4 The Port can broadly be divided into three thirds, the eastern third known as 'Gate 1'. The central third known as Pembroke Dock Ferry Terminal (PDFT) and the western third known as 'Gate 4'.

2.5 The application site itself occupies the majority of Gate 4 and extends to 11.32 ha, is 'L-shaped' broadly, and forms the westernmost third of the Port encompassing most of the Gate 4 area. It contains several larger and smaller modern buildings in addition to six listed buildings (or structures) as follows:

- Grade II* former Graving Dock including bollards and capstans;
- Grade II Building Slip No 1;
- Grade II Building Slip No 2;
- Grade II former Timber Pond (also known as the Pickling Pond);
- Grade II former Foremen's Office (currently in third party ownership but intended to become part of the scheme); and
- Grade II Dockyard Walls.

2.6 The application site also lies within the Pembroke Dock Conservation Area.

2.7 The remainder of the application site is covered in hardstanding and/or scrub vegetation and is underutilised currently.

Description of the proposed development

2.8 The intention of the proposed development is to create a flexible and efficient port-related office, industrial, warehousing and distribution, and ancillary area capable of meeting the needs of the modern blue economy (meaning the sustainable use of ocean resources for economic growth, improved livelihoods and jobs and ocean ecosystem health). This will involve the intensive use of land side areas for fabrication, repair and servicing of boats, renewable energy devices, transporting cargo and other works requiring marine access, served by an appropriately structured highly flexible enlarged slipway. The Indicative Proposed Masterplan is included as **Figure 3**.

2.9 To realise the vision of a centre of excellence, several modifications are required to the layout of the Gate 4 area, including:

- Formation of a single 'mega' slipway;
- Provision of large areas of hardstanding in proximity to the quayside;
- Areas of flat land for use either as 'laydown' or capable of being developed to create buildings in response to time-sensitive business requirements.

- Enhanced interconnectivity between the new Gate 4 facility and the existing Gate 1 facility.

2.10 The proposed development will enable the provision of an enlarged single slipway at Gate 4 to facilitate the efficient transfer of vessels and marine renewable devices between land and sea, together with the formation of large open laydown areas to facilitate working on boats and devices without occupying slipways. The new single slipway will replace two existing smaller slipways and will be designed such that the historic fabric of the outer walls of these two smaller slipways will be retained.

Marine components of the project

2.11 Regarding the marine elements of the proposed development, the proposed works will include:

- Capital dredging around the slipways and within the Graving Dock;
- The creation of a single 'mega ' slipway by combining the two existing westernmost slipways and modification of its gradient into the Milford Haven Waterway;
- The infilling of the Graving Dock; and
- The infilling of the Timber Pond.

Onshore components of the project

2.12 In addition to the hardstanding and laydown areas outlined above, large buildings for assembly, manufacturing and repair of vessels and devices will be required. At the southern boundary, areas and buildings for the importation and storage of goods and raw materials by land for fabrication activities on site will be required.

2.13 To achieve this, the following will be necessary:

- Creation of efficient areas of open space laydown in brownfield areas within the curtilage of the dockyard.
- Infilling the former Graving Dock (via the methods outlined in the marine components constructions section below);
- Infilling the former Timber Pond (via the methods outlined in the marine components construction section below); and
- Demolition of some other buildings which are no longer fit for purpose, although the listed former Foremen's Office will be retained.

2.14 The above will allow the creation of six open areas for light assembly, maintenance, external storage, laydown and parking and an extended slipway and transition area. It will also provide space to construct three buildings to be used for fabrication, repair and light assembly purposes.

2.15 The table below sets out the 'worst case' parameters (i.e. largest), for the purposes of the EIA, regarding the buildings to be erected and the extent of the open areas.

Table 1: Development Parameters

Building	Use	Maximum Footprint (sq m)	Maximum Width and Breadth (m)	Maximum Height (m)
Building A	Fabrication	11,900	170 x 75	40
Building B	Repair and Fabrication	4,900	75 x 65	40
Building C	Light Assembly	2,500	129 x 20	10
Area C1	Light Assembly and Maintenance External Storage and Parking	5,000	N/A	N/A
Area D	Open Batching Plant and Storage Area	12,937	N/A	N/A
Area E1	Employee Car Park	3,050	N/A	N/A

Area E2	Employee Car Park	4,900	N/A	N/A
Area F1	External Multi Use Laydown and Final Assembly Area	8,100	N/A	N/A
Area F2	External Processing and Multi Use Laydown and Assembly Area	4,850	N/A	N/A
Area J	Extended Slipway and Transition Area	11,838	N/A	N/A

Access and parking

2.16 There are two points of access to the proposed development:

- Primary access via Whites Farm Way and Meyrick Owen Way (Gate 4); and,
- Secondary accesses via Admiralty Way and Gate 1 off Front Street (Gate 1).

2.17 The primary access will be used by staff and the secondary accesses will be used for the staff overflow car park and deliveries into the Port.

2.18 In addition to the above, a modified widened highway access point will be required to the Gate 4 area from Whites Farm Way. It is also expected that Mainstay's operation will be incorporated into the modified Gate 4 access arrangements rather than having its own access as at present. This will further contribute to the efficiency of the proposed layout.

2.19 The proposed development will provide an appropriate level of on-site parking in accordance with Pembrokeshire County Council (PCC) parking policies. In addition, secure covered cycle parking will be provided to encourage the use of sustainable, active travel as well as a pedestrian/cycle crossing across Meyrick Owen Way, in the vicinity of the primary vehicle access to the site.

Appearance and design

2.20 The proposed buildings, out of operational necessity, are relatively large. However, historically, the Port has accommodated several large buildings, especially the numerous historic slipway cover buildings, which were located adjacent to Milford Haven Waterway.

2.21 Consequently, the key design principles that have been adopted for the proposed buildings includes curved roofs and mansard side elevations to echo the shape of the historic slipway cover buildings. In addition, in order to mitigate the scale and mass of the proposed buildings, cladding options have been considered, such as horizontal cladding panels grouped by colour, which is a widely used method for reducing the scale of buildings such as distribution warehouses and stadia whereby the cladding pattern can be altered to reduce the mass and bulk of the building, or using a combination of opaque and scattered translucent panels, which is the favoured option for the site – echoing the glazing pattern of former slipway covers at the site.

2.22 Regarding the creation of the mega slipway and the infilling of the Graving Dock and Timber Pond, the project design has considered the heritage value of the existing structures affected and seeks to preserve as much of the original fabric as possible. Prior to commencement of works to them, these structures will be recorded in detail and any subsequent infill undertaken in a manner that is reversible, preserving their fabric in situ. Visible re-use of existing features, such as coping stones, capstans, bollards and the caisson gate, will be incorporated within the development.

Drainage and flood risk

2.23 The sustainable management of surface water is an essential element of reducing future flood risk to the site and its surroundings.

2.24 As the existing site mainly contains low permeable hardstanding there will be negligible change in the permeability of site surfacing as a result of the proposed development. However, the proposed development includes the infilling of the Timber Pond into which a proportion of the site's surface water run-off discharges via the existing drainage network before discharging via an outfall into the Milford Haven Waterway.

2.25 The proposed surface water management strategy will, therefore, be required to re-route the existing site drainage network through or around the infilled Timber Pond possibly to a new outfall to the Milford Haven Waterway. In addition, the existing culvert connection between the Timber Pond and Graving Dock is to be sealed with inflows diverted accordingly. Overall, the drainage strategy will involve run-off being directed to new outfalls passing through interceptors and/or separators, as appropriate, prior to 'clean' water discharging into Milford Haven Waterway.

2.26 Foul drainage will be routed via the dockyard wall to be picked up by the sewer leading to the adjacent Dwr Cymru Welsh Water (DCWW) treatment works.

2.27 A detailed drainage infrastructure design will be secured via an appropriately worded planning condition and submitted prior to construction for regulator approval.

Lighting

2.28 The operational lighting principles will be set out within a lighting strategy for the proposed development. The strategy will include the following key principles:

- Comply with the requirements of the Docks Regulations and other health and safety legislation.
- Designed to be contained within the site, avoiding spill into adjoining properties, an objective that is aided by the existing high dockyard walls and the shading provided by both existing and proposed buildings.
- The proposed green space at the southern boundary of the site is being designed as a bat flight corridor with very low lux levels (max 1 lux).
- Proposed Building C will be designed to avoid light spill from internal light sources that could affect the bat flight corridor.
- Lighting will be managed such that it does not remain on when not required and so that it can be dimmed to suit certain operational situations.

2.29 A detailed lighting strategy addressing the above principles and the wider operational requirements of the site is anticipated to be the subject of an appropriately worded planning condition and will be submitted to PCC for approval prior to the beneficial operation of the development.

Sustainability

2.30 More broadly, the proposed development will facilitate the development and advancement of marine renewable energy technologies and devices designed to reduce reliance on fossil fuels, reducing the emission of greenhouse gases (GHGs) and the carbon density of the UK's electricity mix available through the distribution network in response to the threat of climate change .

2.31 More specifically within this project, the proposed buildings incorporate translucent panels that will enable natural daylight to penetrate the interior, reducing energy demand for artificial electrical lighting during daylight hours. The translucent panels will also potentially light external areas of the site at night, reducing energy demand for external lighting during hours of darkness.

2.32 The buildings are anticipated to have relatively low heating demand due to the nature of activities taking place within them.

2.33 Opportunities to design out energy demand through energy efficiency and introducing low carbon energy supply will be explored more closely at the detailed design stage.

Waste

2.34 The proposed development will not give rise to hazardous waste. The anticipated fabrication and repair activities on site are likely to produce some commercial waste although these are unlikely to be significant and are expected to be adequately dealt with via standard waste management procedures .

Use of natural resources

2.35 The proposed development is located on brownfield land within the existing Port and will not require the significant use of land, soil and biodiversity resources. Where possible, materials arising from dredging and demolition works will be recycled for infilling of associated elements of the project and, in some cases, it might be possible to re-use any stonework that is removed to repair damaged sections of masonry elsewhere.

Residues and emissions

2.36 Relevant details of residues and emissions in relation to water, air (e.g. dust) and noise and vibration are set out in Chapters 6 (Marine Environment), 8 (Noise and Vibration) and 9 (Air Quality) of this ES. Lighting is considered within Chapter 16 (Biodiversity) and 14 (Landscape and Visual) as relevant.

Construction

2.37 The details of construction methods, timing and phasing are necessarily broad at this stage. The limits of the assessment, however, have been set sufficiently wide to allow a robust assessment to be undertaken of a reasonable worst-case scenario.

Marine components construction

New slipway

2.38 The new slipway will be created by carefully removing the central section between the two existing slipways, removing the rails, supports and hauling system from Slipway No. 2 and re-grading the whole area to form a new concrete ramp sloping down into the water which will be approximately 65 m wide. The design will ensure that the extent of the underwater construction at the seaward end will be minimised whilst maintaining the required water depth for the launch and recovery of a full range of vessels and modules.

2.39 Works will include the careful dismantling of the existing structures between the two existing slipways, the intention being to retain the flank walls closest to the Graving Dock and Carr Jetty on the east and west slipways respectively.

2.40 The new slipway is likely to comprise a 500 mm thick reinforced concrete slab over 1,000 mm of compacted granular sub-base or a bed comprising single sized rock. It is anticipated to extend to approximately 4.27 m below chart datum and cover an area of approximately 67 by 172 m. These works may necessitate some pre-construction dredging (below MHWS) within the footprint of the new slipway and, should this be required, it is anticipated that approximately 3,551 m^3 of soft silt and clay sediments would be dredged and approximately 5,353 m^3 of coarse sand, gravel, bound mudstone and mudstone would be removed. Excavation above tide level will be undertaken by backhoe excavator and rock excavation will be by hydraulic breaker or a milling attachment will be used. Alternatively, a larger excavator will be used if the rock is sufficiently weak to be excavated. Below tide level, the backhoe excavator will be positioned on a barge and work from it, if necessary, using a larger machine and/or ripper tooth or teeth bucket to achieve the necessary force.

2.41 The bathymetric survey undertaken shows that approximately 40 m from the quay wall/end of the existing slipways the rock stratum drops away quite quickly. Therefore, to minimise the extent and complexity of the underwater construction at the seaward end of the new slipway it is proposed to increase the gradient from 1 in 17 (at the existing slipways) to 1 in 12 and move the slipway crest landward by approximately 36 m. This approach will avoid having to place a significant thickness of fill and construct an underwater retaining wall at the end of the slipway, or alternatively support this section of the works on piles, thereby minimising the impact on the marine environment.

2.42 As the gradient of the new slipway has been increased and the crest moved landward, the new slab level will be below the foundation level of the existing flank walls. These walls will, therefore, be underpinned. The underpinning will be carefully organised and executed to maintain the integrity of the existing walls and to undertake the work tidally ‘in the dry’. It is likely that a new

reinforced concrete boundary wall will be constructed below the existing wall. This method would secure the long-term integrity of the flank walls and provides the opportunity for viewing and recording the original construction work.

Graving Dock

2.43 The works to infill the Graving Dock will include the removal of the existing caisson gate and removal of silt and debris from within the dock. It is anticipated that sediments within the Graving Dock are to a depth of approximately 2-3 m with the removal of up to approximately 7,100 m^3 of material in total. The likely method of removal of sediments will be via a temporary cofferdam installed across the entrance to the dock and material removed via sludge pump and excavator in the dry. Once cleared, the preferred option that maximises the preservation of the historic fabric of the dock is for it to be partially infilled with crushed stone over a layer of sand with a mass wall erected at the invert to the seaward end of the dock, which preserves the opening and caisson slot.

Timber Pond

2.44 The infilling of the Timber Pond will require the decommissioning/plugging of the intake and outfall pipes (e.g. by installing sheet piles against the face of the culverts) followed by the dewatering of the pond and either the treatment or removal of the sediment. If the sediment is left in situ it will be covered with a geotextile prior to infilling. If the sediment is removed, then a layer of sand will initially be placed to protect the bed of the pond and side walls prior to infilling with sand and granular material. The infill material will be placed up to the existing ground level.

Materials reuse in Graving Dock and Timber Pond

2.45 The vision is for the majority of materials that arise from marine dredging activities and dismantling of the onshore elements between Slipways 1 and 2 to be re-used as engineering fill within the significant voids within the site that require infill at the former Timber Pickling Pond and Graving Dock. The re-use as infill will be only if “suitable” material. If unsuitable, or uneconomical / impractical to recover for reuse as fill then these will be sent to an onshore licensed disposal site.

Onshore components construction

2.46 The hardstanding and laydown areas and the proposed buildings will be constructed using standard construction techniques, as will any demolition of existing onshore structures.

2.47 Hardstanding areas will be stripped and then laid with compacted hardcore and finished in concrete and/or tarmacadam.

2.48 The proposed buildings will, subject to final design, be of structural steel frame construction, under coated standing seam roofing, walls/mansard sides to be 70% composite Kingspan and 30 Rodeca glazed panels fixed to purlins and sheeting rails. The internal fit-out of the buildings will be subject to the occupier’s specifications although is likely to include the installation of overhead gantry cranes in addition to switchgear, power and lighting installations and office and welfare facilities.

2.49 The method of constructing foundations for the proposed buildings will depend on ground conditions. It is expected, however, that the building proposed over the Timber Pond will require piled foundations. Where the calculated loads to be imposed on the foundations are large it is likely that piled foundations will have to be used in order to reach the stronger unweathered bedrock. More lightly loaded foundations may still require the use of piles if the top layers of rock are poor quality or at a depth of more than approximately 2 metres. Where the ground is of suitable quality and foundations are lightly loaded then pad foundations will be used. For heavy duty foundations the piles are likely to be bored cast in place piles. More lightly loaded piles are likely to be driven precast or steel piles.

Indicative phasing of construction works

2.50 The timing of the proposed development will be dependent on securing planning permission, the discharge of planning conditions and the approval of reserved matters details.

2.51 The construction of the new slipway is likely to be undertaken in phases to ensure that an operational slipway always remains available. Whilst this will affect the cost of undertaking the works and will lengthen the overall programme it has the benefit that it allows works to the listed structures to proceed in a very controlled manner.

2.52 At this stage it is anticipated that construction works for the marine components will take approximately 18 months .

2.53 Services infrastructure is anticipated to take around 12 months and the construction of the hardstanding area is also anticipated to take around 12 months.

2.54 Similarly, it is anticipated that each of the buildings would take approximately 12 months to construct.

2.55 The broad sequence of construction activities is likely to be :

- Q2 2021 – contractor mobilisation:
  - Set up of construction access routes at Gate 4;
  - Contractor site offices, welfare facilities and material compound;
  - Identification of heritage assets, working areas, services and development of the Construction Phase Plan, Environmental and Waste Management Plans;
  - Demolition of buildings directly affected by the slipway development.
- Q2 2021 to Q4 2022 – slipway construction works;
- Q2 2021 to Q1 2022 – decommissioning and infilling of the timber pond;
- Q3 2021 – provision of ecology measures, land remediation and development of laydown areas;
- Q4 2021 to Q3 2022 – removal of the Caisson Gate and infilling of the Graving Dock;
- Q2 2022 to Q3 2023 – demolition of buildings, infrastructure works, including construction of internal roads, drainage works and sewage pumping station;
- Q3 2023 – completion of infrastructure development;
- Q4 2023 – construction of building substructures (subject to demand for facilities);
- Q3 2024 to Q3 2026 – erection of superstructures and building finishes, landscaping and planting in accordance with landscape strategy.

2.56 The construction sites would be fenced during construction. It is the intention of the applicant that the site would be registered under the Considerate Constructors Scheme or a similar locally recognised certification scheme.

Construction working hours

2.57 In general, working hours would be 07:00 to 19:00 hours Monday to Friday, 07:00 to 13:00 hours on Saturday with no construction on Sundays or on public or bank holidays. These hours would be subject to agreement with PCC. However, some works will be tidally restricted and will, therefore, need to take place outside of these hours. Works required outside of these hours would be agreed in advance with PCC and appropriate measures would be taken to avoid exceeding agreed noise levels.

Environmental management during construction

2.58 Construction would be undertaken in accordance with the Outline Code of Construction Practice (OCoCP). The OCoCP sets out the key management measures that contractors would be required

to adopt and implement. These measures have been developed based on those identified during the EIA process and set out in the topic chapters of this ES. They include strategies and control measures for managing the potential environmental effects of construction and limiting disturbance from construction activities as far as reasonably practicable.

2.59 The OCoCP would form the basis of more detailed plans and method statements, including a Construction Environmental Management Plan (CEMP), to be prepared during the pre-construction period once a Principal Contractor has been appointed. The final CEMP would be agreed with PCC and is expected to be the subject of a planning condition.

Construction working areas

2.60 Construction is expected to be undertaken within the proposed masterplan site boundary. However, should additional land be required for construction compounds this would be provided within the existing operational Port.

2.61 Several temporary facilities would be required during construction including:

- Temporary offices and welfare facilities;
- Storage area for materials, fuels, plant and equipment;
- Waste management areas; and
- Car parking facilities.

Construction access

2.62 The construction access point will be via the existing Gate 4 entrance to the site. The principal route to the access from the A477 would be via London Road, Western Way, Commercial Row and Meyrick Owen Way (A4139).

2.63 Every effort would be taken to minimise the effects of traffic associated with the construction phase of the proposed development. Materials and resources would be sourced locally where possible and deliveries and construction traffic would endeavour to avoid travel during commuter peaks.

2.64 A Construction Traffic Management Plan (CTMP) will be provided to (and agreed with) PCC prior to the commencement of any construction works .

Construction waste

2.65 Works to install the new slipway will necessitate some pre-construction dredging and it is anticipated that up to approximately 21,450 m3 of material would be dredged or removed below MLW. The works to infill the Graving Dock will require the removal of up to approximately 7,100 m3 of material.

2.66 Accordingly, it is estimated that a total volume of approximately 73,340 m3 of spoil will be generated from works to remove material from both the footprint of the new slipway and the graving dock . The possibility of beneficial use of this material on site (for infill) will be assessed and implemented if it is practicable to do so in accordance with Appendix 2.5 . Otherwise, this material will be disposed of at an authorised onshore disposal site.

2.67 All other construction wastes would be recycled wherever possible.

Operation and maintenance

2.68 The proposed development has been designed to allow a more efficient use of the Port for fabrication, repair and servicing of boats, renewable energy devices, transporting cargo and other works requiring marine access, served by an appropriately structured highly flexible enlarged slipway.

The long-term management strategy for the proposed development will be the responsibility of MHPA, subject to the conditions relating to servicing and management included within any tenancy agreements that MHPA enters with other companies that may operate within the site.

3 NEED AND ALTERNATIVES CONSIDERED

Need for the development

3.1 The overarching need for the development stems from the growing requirement to decarbonise the UK and Wales' energy systems in order to combat climate change, which is evidenced in the following key commitments that the United Kingdom and Wales has subscribed to:

- United Nations Framework Convention on Climate Change: The Paris Agreement (2015) to limit global temperature rise this century below 2 degrees Celsius above pre-industrial levels, and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.
- Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C (October 2018) setting out that pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in, inter alia, energy, land and infrastructure, and imply deep emissions reductions in all sectors.
- 29 April 2019 Welsh Government Climate Emergency declaration recognising *"… it threatens our health, economy, infrastructure and our natural environment"*.
- 11 June 2019 Welsh Government acceptance of Committee on Climate Change recommendation for a 95% reduction in greenhouse gases emissions by 2050 with an ambition to go further to reach net-zero by 2050.

3.2 The Pembroke Dock Infrastructure (PDI) project forms part of the Swansea Bay City Deal (SBCD) signed on 20 March 2017, which is a £1.3 bn investment in 11 major projects across the Swansea Bay City Region (SBCR), made up of Carmarthenshire, Neath Port Talbot, Pembrokeshire and Swansea.

3.3 The SBCD is being funded, subject to the approval of project business cases, by the UK Government, the Welsh Government, the public sector and the private sector.

3.4 Pembroke Dock Marine (PDM) is identified as a project within the SBCD (http://www.swanseabaycitydeal.wales/energy/pembroke-dock-marine/). The SBCD states that PDM, via the proposed development, PDI, will regenerate an area of Pembroke Port to create a dedicated site which will be used as a base by marine energy developers to progress their devices from an idea to a commercial product. The project will allow developers to test, manufacture and maintain offshore renewable energy devices and will be supported by additional developments of marine infrastructure and commercial support.

3.5 In June 2020 the UK and Welsh Governments approved the business case for the PDM project including PDI.

3.6 The proposed development is therefore designed to allow the Port to continue to operate efficiently whilst also creating a flexible and efficient port-related office, industrial, warehousing and distribution, and ancillary area. This will be capable of meeting the needs of the burgeoning marine energy economy in accordance with the aspirations of Welsh Government, the SBCR and Pembrokeshire County Council, thereby providing a significant contribution to the local and regional economy. It is also set to deliver services and facilities to other blue economic sectors such as shipbuilding, oil and gas, aquaculture.

Alternatives considered

Do Nothing

3.7 Doing nothing was not considered a practicable or sensible solution given that PDI forms part of a named project (PDM) within the SBCD.

3.8 Doing nothing would also represent a missed, once in a generation, opportunity for Wales to be at the forefront of a developing marine energy sector and to benefit from the economical outcomes of that opportunity.

3.9 Doing nothing would also disregard the well-being of future generations, not only economically but socially and in terms of the environment and the decarbonisation of energy systems in Wales. The Welsh Government is committed to cutting greenhouse gas emissions by 95% by 2050 and declared a 'climate emergency' on 29 April 2019. Projects such as PDI will be crucial in achieving Wales' greenhouse gas emissions target and addressing the climate emergency and will also have other well-being benefits such as creating employment both directly and indirectly as well as helping to sustain existing businesses and facilities in the area.

3.10 Pembrokeshire's economy is heavily reliant on the oil and gas industry. Since its peak capacity, the Waterway has seen refinery closures and weakened supply chain resilience. The most recent closure, Murco, had an impact throughout the region. With a wider move towards decarbonised energy, the county has capability and capacity to rebalance its economy and weather any further impact to the traditional fossil fuel energy sector.

3.11 Doing nothing would also reduce the ability to maximise Welsh productivity. Not just in Pembrokeshire but also in its role as a potential support to other energy and engineering projects in the wider locality (Morlais and Hinkley Point C).

Construct PDI at another port location within SBCR

3.12 PDI is supported by SBCR through the SBCD. Therefore, to undertake a site search outside of the region would be unreasonable. As explained above, within the SBCR there are no other port sites available that have relatively flat, underutilised brownfield land located in an established industrial area that have access to relatively deep water, an industry ready supply chain and are located in close proximity to energy source (Pembrokeshire has the highest concentration of wave resource in Wales equating to an indicative capacity of up to 5.6 GW providing a significant opportunity for development of the industry [Marine Energy Wales, 2020]) and complementary projects such as META, Phase 1 of which is already consented adjacent to Pembroke Port, and the PDZ. Convenience and proximity to these sites and other areas of renewable resource is a key operational requirement for marine energy device developers focused on reducing the cost of energy production to become comparable with existing energy sources. Therefore, constructing PDI at another port location within SBCR was discounted accordingly.

Construct PDI elsewhere within the Port of Milford Haven

3.13 In terms of other sites, the Milford Haven Waterway, other than adjacent to Pembroke Port, is a statutorily designated Special Area of Conservation (SAC), and an alternative site within the Milford Haven Waterway would therefore pose significantly greater marine ecology constraints than the application site .

3.14 The key site requirements are a large area of relatively flat land located close to relatively deep water. Whilst Hobbs Point, to the east of Pembroke Port, is located close to relatively deep water, the area available for development is not of the necessary scale. o create an area of sufficient scale at Hobbs Point would require extensive and complex land assembly and acquisition or even reclamation. Any such reclamation would be either within or in proximity to the SAC.

3.15 Furthermore, a largely new build port facility, either at Hobbs Point or elsewhere in the Port of Milford Haven, would likely be prohibitively expensive when compared to the proposed development.

3.16 In summary, there are no other suitable or viable sites within the Port of Milford Haven other than the application site due to a combination of geology, bathymetry, topographic, ecology and viability reasons.

Construct PDI elsewhere within Pembroke Port

3.17 The central third of Pembroke Port is operated by Irish Ferries with associated ferry terminal infrastructure and facilities that it would be expensive, difficult and ultimately unfeasible to relocate elsewhere within the Port.

3.18 Gate 1 already possesses a multi-purpose quay, having seen its historic slipways, berths and docks infilled to create flat quayside areas close to deep water. Gate 1 is already a busy cargo port

with growth in volumes expected and congestion within the operational area already being experienced on occasions. As such, capacity at Gate 1 is expected to be exceeded soon. Whilst the potential to accommodate the infrastructure associated with PDI, in the form of the mega slipway and other large buildings, at Gate 1 was considered, that would simply necessitate the relocation of the flat quayside areas and buildings from Gate 1 to the Gate 4 area with the infilling of the Graving Dock, Slipways 1 and 2 and the Timber Pond still being required.

3.19 Consideration of other alternatives to the proposed 'mega' slipway for land-marine transfer of devices and vessels considered and rejected included:

- Refurbishment and upgrade of the Graving Dock;
- A vessel hoist;
- Jack up barge; and
- Floating dry dock.

3.20 A Preliminary Feasibility Study was undertaken in 2010 for the refurbishment or upgrade of the Graving Dock to understand whether it was capable to be used for modern deeper draft and wider vessels. The study concluded that this would involve the dock floor being lowered and sides widened to accommodate larger modern vessels in addition to a new dock gate, operating equipment, pumps and sluices. This would necessitate the existing stone masonry floors and side walls being removed and the dock entrance being altered substantially. It was also identified that a new steel caisson would be required. Essentially this would comprise the complete dismantling and replacement of the Graving Dock, failing to preserve its historic integrity and would furthermore be uneconomical and contrary to operator preferences.

3.21 The remaining options would also necessitate the infilling of the Graving Dock and Slipways 1 and 2 in order to create the necessary flat quayside area and the associated removal, or obscuring of parts of, the quayside walls. These options would also encroach further into the Haven and potentially have a greater impact on the SAC. Furthermore, operator feedback has expressed the preference for a large multi-purpose slipway as opposed to the other marine transfer options identified above.

3.22 Another option that was considered was moving the mega slipway to the eastern quayside within Gate 4. However, this was discounted because it would result in the complete removal of the Graving Dock and the infill and obscuring of Slipways 1 and 2, which would have a more significant impact upon those heritage assets than the current proposals.

3.23 An alternative of leaving the Graving Dock in its current condition was also considered. The retention of the Graving Dock in this manner would, however, sterilise a significant area of land, circa 1.15 ha (around 10% of the site area and 20% of the operational area), in a desirable location adjacent to the quayside. Such a reduction in the developable and operational area of land at the site would reduce commercial opportunities and the overall viability of the project significantly. It was also considered that this would not necessarily preserve the Graving Dock and its features, including the caisson, which would continue to be situated in the marine environment and be affected by coastal processes. In the absence of a viable re-use of the Graving Dock and the inability to feasibly maintain the caisson, in particular, in its current location, due to access and health and safety issues, the asset is likely to continue to deteriorate over time in a 'do nothing' scenario.

3.24 Similarly, an alternative of leaving the Timber Pond in its current condition was considered. However, this would similarly reduce the developable area of the site by approximately 10% (over 20% of the operational area) and would also restrict the width of the required transport corridor, resulting in a 'pinch point' which would impede operational activity. Furthermore, there is no other viable location within Gate 4 for the 11,900 sq m fabrication building that is required for PDI other than in this position.

Amendments to PDI at Gate 4 to reduce its environmental impact

3.25 Consideration has been given to modifying PDI within Gate 4 to reduce the impact of the proposal on environmental receptors, including those changes listed above.

3.26 However, the locations of the buildings have been carefully considered throughout the iterative design process with efficiency in mind.

3.27 For operations and maintenance purposes and Building B, it is imperative that a building capable of accommodating vessels and fabrications that access the site from the marine environment via the slipway is available. Vessels often require blasting to clean off decay and remove debris which can cause environmental harm if not mitigated. Historically, this process has been done in the open but as a responsible developer, the Applicant's preference is to provide facilities that can eliminate and potential impact on the Milford Waterway SAC and have proposed Building B in that location to enable this. Having this building in close proximity also allows the slipway to be utilised more effectively as vessels will be able to transition out of the production pathway for new builds from Building A.

3.28 Consideration was also given in terms of lowering the height of proposed Buildings A and B so that they did not project beyond the skyline when viewed from the north side of the Haven to minimise landscape and visual impact. However, the proposed development envisages the need for large buildings in order to facilitate the envisaged activities on site. Buildings A and B are proposed for fabrication, assembly and maintenance of engineered structures. A fabrication hall's useful height is normally referred to as 'under the hook' height. This is height at which the buildings' internal gantry crane can operate. Following the signing of the SBCD heads of term, MHPA engaged the market to understand the height and width of components required from technology developers in the wave, tidal stream and floating wind foundation sectors as well as other industry groups. Feasibility work has been undertaken to assess some of the potential future devices components and vessels that could be produced or maintained internally within the buildings and their under the hook height. These demonstrate that the maximum building height proposed is potentially is necessary to accommodate those largest device and vessel manufacturers and operators, should they be attracted to the site.

3.29 Regarding trees and terrestrial habitats, two Category A and several Category B trees exist within the south eastern and eastern parts of the site. There are also protected species in the form of bats and former badger sett that has now been closed. The south eastern perimeter of the site, including existing trees, was identified as a potential bat corridor in discussion with the County ecologist and an area has been reserved as such on the proposed masterplan.

3.30 The main considerations in respect of heritage are set out above. Having regard to those and the other environmental considerations above, the application proposal is considered to be the best option available in terms of the impact of the project on the environment whilst also addressing the identified need. In summary, in comparison to other options for PDI at Pembroke Port, it would:

- Preserve the Grade II* Graving Dock and Grade II Timber Pond structures, albeit partly beneath ground, in a reversible manner to preserve their fabric for future generations. The infill of the Graving Dock would also necessitate the removal of its caisson, which would be retained, removed, assessed, preserved and repositioned within the site together with the capstans and bollards;
- Preserve the function and the majority of the outermost flank walls of Grade II listed Slipways 1 and 2;
- Retain the Grade II listed Former Foremen's Office;
- Retain the Grade II listed Dockyard Walls.
- Retain high quality habitats including mature trees within the south east of the site;
- Provide for protected species of a bat corridor along the south eastern boundary;
- Minimise impact on the Pembrokeshire Marine SAC;
- Remove several buildings that do not contribute positively to the Conservation Area and the setting of listed buildings currently;
- Facilitate the provision of high-quality new buildings that will add to a sense of place .

3.31 In conclusion, it is considered there is a significant identified need for the project in the context of the SBCD, UK and Welsh Government carbon reduction targets, the declared climate emergency and economic regeneration and all reasonable alternatives to the proposed development have been considered but discounted as less preferable to the proposed development.

4 METHODOLOGY

Scoping and consultation

4.1 Scoping is the process of identifying the issues to be addressed during the EIA process. This sets the context for the EIA process.

4.2 A Scoping Request was submitted to PCC and to NRW-MLT on 28th June 2018. A response was provided by PCC on 16th August 2018 and by NRW-MLT on 4th October 2018.

4.3 Responses were received from a range of consultees contacted by PCC and NRW-MLT. The proposed scope of the assessment was informed by the nature and scale of the proposed development and its location. In summary, the topics listed below were proposed to be included in the ES.

- Chapter 1 Introduction
- Chapter 2 Project Description
- Chapter 3 Need and Alternatives Considered
- Chapter 4 Environmental Assessment Methodology
- Chapter 5 Planning Policy Context
- Chapter 6 Marine Environment – Marine Ecology
- Chapter 7 Marine Environment – Coastal Processes
- Chapter 8 Noise and Vibration
- Chapter 9 Air Quality
- Chapter 10 Historic Environment
- Chapter 11 Transportation
- Chapter 12 Socio-Economics
- Chapter 13 Ground Conditions
- Chapter 14 Landscape and Visual Impact
- Chapter 15 Flooding and Hydrology
- Chapter 16 Biodiversity

Topics scoped out of the EIA process

4.4 The topics scoped out of the assessment are summarised below.

Climate change

4.5 An assessment of climate change and greenhouse gas emissions (GHGs) is required under the 2017 EIA Regulations where there is potential for likely significant effects. At present there is no single piece of methodological guidance accepted as standard, although IEMA's guidance on GHG emissions states that, in principle, any GHG emissions may be significant, and advocates as good practice that GHG emissions should always be reported at an appropriate, proportionate level of detail in an ES.

4.6 The proposed development will facilitate the development and advancement of marine renewable energy technologies and devices that would reduce reliance on fossil fuels, in turn reducing the emission of GHGs in response to the threat of climate change.

4.7 A sub-section on climate change is included within the flooding and hydrology ES chapter, which would be relevant and proportionate to the development proposed. Therefore, no separate consideration of climate change is considered necessary.

Climate change resilience

4.8 Resilience to future climate change has been considered during the design process. The design has considered, for example, future flood risk and resilience to extreme weather events. The conceptual surface water drainage strategy for the project has been designed to consider the 1 in 100-year flood risk event, plus an allowance for climate change.

Effects of the project on climate

4.9 Atmospheric emissions associated with use of the proposed development are assessed within Chapter 9 (Air Quality) of the ES. These include emissions from construction and operational traffic.

Population and human health

4.10 An assessment of population and human health is required within the 2017 EIA Regulations where there is potential for likely significant effects.

4.11 Population and human health have a broad scope and is in practice considered across a range of other topic areas within the ES, including socio-economic, noise and vibration, air quality, ground conditions and landscape and visual. These topics are proposed to be included within the ES. Therefore, no separate consideration of population and human health is considered necessary.

Material assets

4.12 The phrase ‘material assets’ has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons. Material assets are in practice considered across a range of topic areas within an ES, including the historic environment and socio-economics chapters. These topics are included within this ES. Therefore, no separate consideration of material assets is considered necessary.

Environmental assessment methodology

4.13 Environmental Impact Assessment is a means of identifying and collating information to inform an assessment of the likely significant environmental effects of a development. For each of the key environmental topics in the Environmental Statement, the following have been addressed:

- Methodology and assessment criteria;
- Description of the environmental baseline conditions;
- Measures adopted as part of the project, including mitigation and design measures that form part of the proposed development aimed at reducing its residual impact;
- Identification of likely effects and evaluation and assessment of the significance of identified effects, considering any measures designed to reduce or avoid environmental effects which form part of the proposed development;
- Identification of any further mitigation or monitoring measures envisaged to avoid, reduce and, if possible, remedy adverse effects (in addition to those measures that form part of the proposed development); and
- Assessment of any cumulative effects with other developments planned in the area.

4.14 Significance levels are defined separately for each topic. Unless separately defined in the topic chapters, the assessments consider relevant topic specific guidance, based on the following scale and guidance:

- Substantial: Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process with regard to planning permission. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer the most damaging impact and loss of resource integrity;

- Major: These beneficial or adverse effects are considered very important considerations and are likely to be material in the decision-making process;
- Moderate: These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision making if they lead to an increase in the overall adverse effect on a particular resource or receptor;
- Minor: These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project; and
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

4.15 Such effects may be beneficial or adverse.

5 POLICY CONTEXT

5.1 A broad overview of the policy context relating to the proposed development, which it is considered to contribute to in terms of objectives or broadly comply with, is provided below.

- Key national legislation, policy and guidance relevant to the proposed development includes:
- United Nations Framework Convention on Climate Change: The Paris Agreement (2015);
- Welsh Government Climate Emergency Declaration (April 2019);
- Welsh Government Commitment to 95% Reduction in Greenhouse Gases (June 2019);
- Well Being and Future Generations Act 2015;
- The Milford Haven Conservancy Act 1958;
  - Milford Haven Conservancy Act 1983;
  - Milford Haven Port Authority Act 1986;
  - Milford Haven Port Authority Harbour Revision Order 2000;
  - Milford Haven Port Authority Act 2002;
  - Milford Haven Port Authority Harbour Revision Order 2012;
- Wales Spatial Plan Update 2008;
- Draft National Development Framework 2020-2040 – now Future Wales – The National Plan 2040;
- Welsh National Marine Plan (November 2019);
- Planning Policy Wales Edition 10 (December 2018);
- Technical Advice Note 5: Nature Conservation and Planning (2009);
- Technical Advice Note 23: Economic Development (October 2014);
- Technical Advice Note 24: The Historic Environment (May 2017); and
- Pembrokeshire Local Development Plan (February 2013).

5.2 An analysis of the proposed development having regard to the planning policy and legislative context is provided in the Planning Statement that accompanies the application.

6 SUMMARY OF ENVIRONMENTAL EFFECTS

6.1 This section provides a summary of the findings of the environmental assessment process. For full details of the assessments, please refer to the Environmental Statement.

Marine environment

6.2 Physical processes, water quality, and marine habitats, species and ecological communities were identified as part of the baseline assessment to assist with determining the level of impact from proposed PDI construction and operation activities. A desktop review was undertaken to characterise the baseline conditions supplemented by sampling of sediments within the proposed dredge footprint to characterise the physical and chemical properties of sediment proposed to be removed for disposal at sea.

6.3 Sediment contaminant concentrations within the proposed dredge area indicate some low levels of contamination across both the slipway and Graving Dock area. The sediments located within the slipway have higher contamination levels than those located within Graving Dock particularly for zinc and tributyl tin.

6.4 The MHW displays a variety of intertidal (zone between low tide and high tide mark) habitats with intertidal mudflat habitat being dominant. The intertidal habitat in the immediate vicinity of the Pembroke Port is comprised of mud and rock. The mud substrate supports communities of polychaetes, oligochaetes and bivalves whilst the rock communities are characterised by seaweed algae and other species that live on the surface of the seabed such as sponges, ascidians, and shellfish. An intertidal seagrass species known as dwarf eelgrass is found at Hobbs Point located 1100 m to the east of the proposed PDI development area and covers an area of 3.29 ha.

6.5 The subtidal (zone below low tide mark) habitats of the MHW are represented by mixed sediments, reef, eelgrass and maerl beds. Oligochaetes (worms), polychaetes (bristle worms), bivalves (shellfish) and amphipods (shrimps) characterise the mixed sediments. Subtidal reef habitat has a patchy distribution throughout the MHW and is typically characterised by algae and bivalves on hard substrate. The reef building polychaete Sabellaria spinulosa has also been noted within the MHW and in undisturbed areas may form reef structures.

6.6 There are three populations of the subtidal eelgrass within MHW, the largest of which lies 7 km to the west of Pembroke Port, located in Littlewick Bay on the northern shoreline of MHW. Subtidal eelgrass in MHW is typically found on sand to fine gravel in depths of up to 5 m. There is a maerl bed located 7-9 km west of Pembroke Port; in the vicinity of Littlewick Bay to Stack Rock.

6.7 Nineteen species of fish have previously been identified within the MHW including elasmobranchs (sharks and rays), flat fish (plaice), gobies, sand smelt and bass. The substrates around Pembroke Port also support several common shellfish species, which are considered typical of estuarine environments.

6.8 The waters near Pembroke Port are not a key area for marine mammal species (whales, dolphins, porpoises, seals and otter). Data shows infrequent sightings of harbour porpoise and bottlenose dolphin within the MHW with a low likelihood of occurrence as far up as Pembroke Port. Grey seal may occasionally occur in low numbers within the MHW and near to Pembroke Port. Otter is also likely to occur near Pembroke Port, although is unlikely to have breeding sites in this area due to the disturbance from the existing anthropogenic activities associated with Pembroke Port.

6.9 Several mitigation measures have been considered as part of the intrinsic project design to reduce potential environmental effects. These measures are considered to be standard industry practice for this type of development and include the following:

- Construction Environmental Management Plan (CEMP);
- Environmental Management Plan (EMP);
- Invasive and Non-Native Species (INNS) Management Plan;
- Installation of a cofferdam at the entrance to Graving Dock; and
- Use of backhoe dredge to undertake dredging activities.

6.10 A number of potential impacts associated with the installation and operation of the proposed development on marine biodiversity receptors have been assessed, including temporary and permanent habitat loss, underwater noise emissions, increased suspended sediment concentration (SSC), sediment deposition and accidental pollution events.

6.11 Some permanent and temporary loss of, or disturbance to seabed habitat as a result of construction works is expected within the proposed redevelopment area. Due to low abundance and diversity of benthic and shellfish communities, this activity is not expected to have a significant impact.

6.12 Increased suspended sediment in the water column as a result of construction activities is unlikely to affect benthic habitats, fish and marine mammal species due to the localised extent of sediment plumes that will be generated by dredging activities and the short duration predicted. Contaminant release from sediments during dredging is unlikely due to the low volume of sediment and levels of contaminants within sediments.

6.13 Noise impacts associated with dredging have the potential to cause injury and disturbance to marine mammals and fish species, the densities of animals within the zone of influence are so small that populations are unlikely to be affected. Injury to marine mammals would not occur. Some recoverable injury may occur for some fish species such as gadoids and eels if dredging operation continued for 48 hours and fish remained within a few meters of the source for this period, which is highly unlikely given the high motility of fish who will move away from the noise source. Disturbance to marine mammals were predicted to occur out to 1.6 km for dredging activities. For fish behavioural effects including startle responses, strong avoidance behaviour, changes in swimming or schooling behaviour or changes of position in the water column from dredging. For vessel movements and dredging, disturbance ranges of 19 m and 5 m were predicted respectively.

6.14 Increased collision risk to marine mammals as a result of vessel movement during the construction phase is expected to be low, primarily as the increase in number of vessels from the existing operational levels of the port is only marginal, and vessel speed within the Port will be low.

6.15 It is possible that an accidental loss of diesel from vessels involved in the PDI, could impact negatively on marine biodiversity receptor through toxicological effects or through smothering by oil. However, marine mammals and fish species are highly mobile and are able to detect these pollutants and as a result are expected to avoid areas where pollution has occurred. Immobile species that live on the seabed are more vulnerable to accidental pollution, however the likelihood of a large spill occurring is extremely low, as the risk will be managed by a CEMP and by MHPA's oil spill response procedures during the operational phase.

6.16 The potential for cumulative effects arising from the project, in association with other projects was assessed. Projects which could foreseeably overlap temporally or spatially with the proposed redevelopment, or where construction impacts may be consecutive but cumulative, were considered. Underwater noise and increased SSC impacts were found to have the widest potential impact, and therefore the location and zone of influence of other projects were assessed on this basis. Some potential overlap both spatially and temporally was identified from other projects for increases in SSC and underwater noise. For SSC, identification of the location of other dredging activities that may temporally overlap with the PDI project found SSC concentrations would likely be low due to proposed volumes to be dredged and would return to background levels rapidly on cessation of dredging resulting in a minor cumulative effect. For underwater noise the cumulative disturbance area and/or the period in which disturbance effects are observed may be greater, however given the low numbers of marine mammals and high recovery rate of fish to disturbed areas, cumulative impacts were considered to be minor.

Shipping and navigation

6.17 The Port of Milford Haven is a leading UK shipping gateway handling liquid bulk, break bulk, dry bulk and project cargoes. It is the UK's largest energy port and is capable of delivering 30% of the UK gas demand. The PDI project is located within Pembroke Port in the MHW. It is owned and operated by MHPA which is responsible for pilotage and conservancy on MHW. The Port operates on a 24-hour basis and has an established reputation for cargo and ferry services. There are no formal anchorages in the immediate vicinity of Pembroke Port. There are explicit anchoring

prohibited areas around the wreck north east of the ferry berth. Anchoring is regulated and managed by MHPA port control.

6.18 MHPA provides a Vessel Traffic Service (VTS) which actively monitors MHW below the Cleddau Bridge. MHPA data indicate that there are approximately 182 departures/arrivals from Pembroke Port per month during the winter months and 166 during the summer months. There is no significant difference between winter and summer traffic levels, with the Irish ferry making up the majority of movements, along with departures from Berths 1 and 2 on the eastern side of the Port, away from the project site.

6.19 Commercial vessels include tankers and cargo vessels. Generally, these vessels were recorded transiting to the eastern berths POP1 and POP2 and approaching from the north around Dockyard Bank.

6.20 Pembroke Port is an important ferry port for southern Irish Sea passenger and freight traffic. The Irish Sea ferry routinely makes two departures/arrivals per day from Pembroke Port, with the normal route taken (north of Dockyard Bank and on the berth at Pembroke Dock Ferry Terminal (PDFT).

6.21 There were minimal fishing vessel movements recorded in the Study Area, with a small number of tracks recorded in the winter period only.

6.22 MHW is an important and well used area for water-based leisure activities, including sailing and motorboat cruising. There are also a wide variety of other activities including paddle sports, sail training, swimming, diving and coasteering.

6.23 183 incidents in the vicinity of MHW have occurred over a period of 20 years (between 1997 and 2017). The most common causes were accident to person, mechanical failure/loss of control, contact and grounding.

6.24 Several mitigation measures have been considered as part of the intrinsic project design to reduce the potential for impacts on shipping and navigation. These measures are considered to be standard industry practice for this type of development and include the following:

- Promulgation of information including Notices to Mariners during the construction phase, advising on the location, nature and timing of the works.
- Aids to Navigation.
- Marine charting.
- Advisory clearance distances are likely to be recommended around vessels undertaking construction activities. The nature of the advisory clearance distances will be discussed and agreed with the MHPA on a case-by-case basis.
- The PDI project will consider the use of safety vessels/guard boats during construction activities.
- Compliance with International Maritime Organisation Conventions including COLREGs and SOLAS.
- Update to Navigation (Marine) Safety Management System.
- Review of Port Emergency Plan.

6.25 The presence of construction activities and associated vessels in the vicinity of the project may deviate vessel routes leading to a loss of navigable space. There may be up to 31 construction vessel movements associated with the slipway works over the construction period and there may be temporary advisory clearance distances around construction/dredging vessels. The number of construction vessel movements across the 12-month construction period is therefore relatively low in comparison to the baseline level of port-related traffic. It is anticipated that vessels using the eastern approach route (i.e. commercial vessels, the Irish Sea Ferry, tugs and other service vessels) will be able to continue to use the eastern approach route during construction activities. Vessels using the western approach route (i.e. tugs and other service vessels) may experience restricted access.

6.26 The presence of construction activities and associated vessels in the vicinity of the PDI project may lead to increased vessel to vessel collision risk. The overall risk rating was considered to be

low (Acceptable) and as low as reasonable possible for various vessel types. The designed-in measures including promulgation of information through Notices to Mariners and appropriate navigational marking will ensure that mariners are aware of the location of the construction works and can plan accordingly. Existing port traffic management measures will also remain effective, including clear channel marking, proactive VTS traffic management and zoning of MHW.

6.27 Presence of construction activities and associated vessels in the vicinity of the PDI project may lead to increased vessel to structure contact ('allision') risk. This impact considers the potential for contact/allision with a fixed structure due to a range of possible causes including ineffective aids to navigation or promulgation of information. The overall risk rating was considered to be low (Acceptable) for passenger vessels, recreational vessels, and tugs/service craft; and ALARP for commercial vessels. The designed-in measures including promulgation of information through Notices to Mariners and appropriate navigational marking will ensure that mariners are aware of the location of the construction works and can plan accordingly.

6.28 During operation phase of the project the presence of additional vessels using the PDI project facilities may increase traffic density and deviate vessel routes leading to a loss of navigable space. The project has been designed to accommodate up to 1 additional vessel per day. Operations from the re-configured slipways may be tidally constrained and working within tidal windows may need to be considered in traffic management planning, especially if such windows coincide with other vessel (e.g. ferry) movements. The number of additional vessel movements was considered comparatively low in comparison to the baseline level of port related traffic and all traffic will continue to be managed by means of VTS traffic management. Considering the designed-in measures the overall impact was not considered to be significant in EIA terms.

6.29 The presence of additional vessels in the vicinity of the project may lead to increased vessel to vessel collision risk. The project has been designed to accommodate up to 1 additional vessel movement per day. This potential magnitude is considered to be low (Acceptable) for tugs and all other vessels and as low as reasonably possible with commercial, passenger and recreational vessels. Considering the designed-in measures the overall impact was not considered to be significant in EIA terms7.1.166 The presence of additional vessels in the vicinity of the project may lead to increased vessel to structure allision risk, whereby a vessel may make contact with a fixed structure (e.g. jetty). The overall risk rating was considered to be low (Acceptable) for passenger vessels, recreational vessels, and tugs/service craft; and ALARP for commercial vessels. Considering the designed-in measures the overall impact was considered to be significant in EIA terms.

6.30 RNLI lifeboats are stationed at Angle on the southern shore of MHW and HMCG helicopter assets are based at St Athan near Cardiff, and Newquay in Cornwall. The construction and operation phase is likely to have minimal impact on SAR response, though consideration will need to be given during the construction phase to access to vessels and the shore for lifeboats and helicopters while construction is underway (i.e. provision of safe access/landing sites). During operation consideration will be given to reviewing the Port Emergency Plan in light of the changed use of the port infrastructure to ensure access.

6.31 The Marine Energy Test Area (META) Phase 1 and Phase 2; and Pembrokeshire Wave Energy Demonstration Zone were considered to assess cumulative impacts from the project on shipping and navigation impacts in terms of impacts on navigable space, allision risk, SAR and pollution response capabilities. It was found that the level of impact were not significant in EIA terms for all impact pathways assessed.

Noise and vibration

6.32 The potential noise and vibration effects from the construction and operation of the project are considered to be:

- Construction phase - temporary effects of noise and vibration from construction works; and the
- Operational phase –noise from plant and activities on site and noise from development traffic on the local area.

6.33 The proposed development site is located within an operational port. The surrounding area is a relatively quiet, suburban location. The main sources of sound are from activities within the Port, sea-going vessels and natural sources.

6.34 Construction and demolition plant are likely to include noise generating plant such as excavators, dump trucks, telehandlers, mobile cranes, delivery lorries, concrete breakers, concrete mixers and pumps, concrete rollers and vibrations, a concrete batching plant and concrete crushing plant. Piling will be required for building foundations and hence adverse vibration effects may also occur.

6.35 There are residential properties and two hospitals relatively close to the site and within 100 m. Therefore, without mitigation, there is potential for noise disturbance and albeit less likely, vibration disturbance as a result of construction activities. Noise and vibration would be controlled during the construction phase by means of a Construction Environmental Management Plan (CEMP), to reduce this to a minimum. If there is vibration sensitive equipment in either of the hospitals then measures to minimise impacts on this equipment may need to be taken into account in the CEMP.

6.36 During the operational phase, without suitable mitigation, there is potential for noise to arise as a result of activities within certain parts of the development that could include some minor annoyance during the daytime and sleep disturbance during the night-time. Therefore, controls will need to be secured to ensure that levels are below those that could give rise to sleep disturbance. Such controls include standard noise suppression measures and can be controlled via appropriately worded planning conditions.

6.37 Noise from traffic associated with the development would increase from baseline in some locations, so may be noticeable, but is unlikely to result in annoyance.

6.38 In summary, although there is potential for significant adverse effects to arise, with adequate controls, the construction and operation of the proposed development should not, in noise and vibration terms, conflict with national or local policies.

Air quality

6.39 The potential air quality effects from the construction and operation of the Proposed Development are considered to be:

- Construction phase - an evaluation of the temporary effects from fugitive construction dust and construction-vehicle exhaust emissions; and the
- Operational phase – an evaluation of the impacts of the development traffic on the local area.

6.40 The site is not located within an Air Quality Management Area (AQMA) and existing air quality at the site and in the immediate surrounding area is very good. The site is approximately 3 km to the north-west of the nearest AQMA at Westgate Hill, designated by Pembrokeshire County Council due to high levels of nitrogen dioxide (NO2) pollution from road traffic.

6.41 For the construction phase, the most important consideration is dust. Without appropriate mitigation, dust could cause temporary soiling of surfaces, particularly windows, cars and laundry. The mitigation measures provided within this report, drawn from IAQM guidance, should ensure that the risk of adverse dust effects is reduced to a level categorised as “not significant”.

6.42 For the operational phase, arrivals at and departures from the site may change the number, type and speed of vehicles using the local road network. Changes in road vehicle emissions are an important consideration during this phase of the development. Detailed atmospheric dispersion modelling has been undertaken for the first year in which the development is expected to be fully operational, 2020. Pollutant concentrations are predicted to be well within the relevant health-based air quality objectives. Using the criteria adopted for this assessment together with professional judgement, the operational air quality effects are considered to be ‘not significant’ overall and no mitigation is considered necessary.

6.43 The Proposed Development does not, in air quality terms, conflict with national or local policies and there are, therefore, no constraints to the Proposed Development in the context of air quality.

Historic environment

6.44 The proposal site is located wholly within the Milford Haven Waterway Landscape of Outstanding Historic Interest (LOHI) and almost wholly within the Pembroke Dock Conservation Area. The Royal Dockyard (HM Pembroke Dockyard) was established as a naval dockyard from around 1812 and was used for shipbuilding until 1926; it was the only Admiralty dockyard ever established in Wales. More than 250 vessels were launched from the slipways between 1816 and 1922, covering the period from wooden ships under sail, through to wooden steamships, ironclads and then full steel vessels, with the dockyard adapting to all these changes in technology.

6.45 Following the closure of most of the dockyard in 1926, it was reused and redeveloped from 1931 by the Royal Air Force as a base for flying boats, eventually becoming the largest such base in the world. Flying boats from Pembroke Port played a crucial role in the Second World War, providing convoy escorts in the Atlantic and air sea rescue duties as well as hunting enemy submarines. The Admiralty retained land at the western end of the dockyard, which was used for refuelling and maintenance, and also as a support site for vessels involved in anti-submarine defences within the Haven and in supporting convoys.

6.46 The RAF finally left in 1959 since when the dockyard has acquired several new users and tenants, including the Irish ferry service operating between Pembroke Dock and Rosslare. The dockyard was disposed of into the private sector in 2008.

6.47 Several listed buildings are present within the proposal site, including a Grade II* listed graving dock, two Grade II listed shipbuilding slips, a Grade II listed timber pond and a Grade II listed former foremen's office. The dockyard walls which form the southern and much of the western boundary of the proposal site is also listed at Grade II.

6.48 Numerous additional designated historic assets are present within the dockyard including a medieval tower (part of a pre-dockyard manorial complex), Georgian and Victorian officers' accommodation and office buildings and a chapel, and two large hangars built by the Air Ministry for the maintenance and repair of seaplanes (flying boats). Outside the dockyard are other designated historic assets associated with the defence of the naval facility. These comprise two gun platforms (also known as Martello towers) just to the north-east and south-west of the dockyard walls, a substantial mid 19-th century defensible barracks further to the south, and two bomb stores just to the south-west of immediate pre-Second World War date.

6.49 The assessed likely impacts and effects on aspects of the historic environment are presented in Chapter 10 of the ES. Significant adverse effects during construction have been identified with regard to the following historic assets:

- The Grade II* listed graving dock (infilled and partially built over);
- The Grade II listed timber pond (infilled and built over);
- The Grade II listed Building Slips No. 1 and 2 (partially removed);
- Five non-designated Admiralty buildings of c. 1861 - 1926 date (dismantled);
- Three non-designated Air Ministry buildings of c. 1926-1945 date (dismantled);
- Eleven non-designated Admiralty buildings of c. 1926 - 1945 (dismantled);
- The non-designated 'paddock wall' (partially dismantled); and
- The Grade II listed Dockyard Walls (changes within setting).

6.50 There would be adverse effects regarding other historic assets, including the Pembroke Dock Conservation Area, but these would not be significant in EIA terms.

6.51 The proposal site is located wholly within the Milford Haven Waterway Landscape of Outstanding Historic Interest (LOHI). A detailed assessment of the impact of the proposed development on the LOHI carried out in accordance with the appropriate methodology concluded that the overall significance of impact on the LOHI would be Moderate, on a 6-part scale of: Very Slight; Slight; Moderate; Considerable, Severe: Very Severe.

6.52 Various measures have been incorporated into the design of the scheme in order to avoid or reduce any adverse impacts and effects. These have been subject to a process of consultation

with statutory authorities throughout which various design options have been reviewed and discussed.

6.53 Revisions have been made to the layout of the proposed scheme such that a Grade II listed building currently in poor condition is retained and can be conserved and restored to use, with the removal of unsightly modern structures and materials so that the building can be seen and appreciated.

6.54 Although the Grade II* listed graving dock will be carefully infilled and a new building constructed in this location, the design of the works here has allowed for the retention of the dock entrance as a visible feature. The caisson which formerly sealed the dock when necessary will be recovered from its current location (where it continues to deteriorate) and will be conserved and placed on display close to the dock entrance where future maintenance is possible.

6.55 Potential designs for the two largest of the three new buildings have been prepared, showing how these could reflect the heritage of the dockyard by referring back to the former large shipbuilding sheds (slipway covers) which once extended along most of the northern edge of the dockyard, and also reference large airship hangars to complement the existing Sunderland hangars in the eastern part of the dockyard.

6.56 A proposed programme of historic building recording would help to offset the effects of the dismantling (complete and partial) and infilling of historic structures. The results of this work could be utilised within a digital history of the dockyard appreciated through virtual or augmented reality technology.

6.57 Although the potential for impacts on buried archaeological remains is fairly low, a proposed programme of archaeological investigation will focus on the location of the mid-18th century Pater Fort.

6.58 The significant effects described above for the construction phase would continue throughout the operation of the proposed development, other than those which occur as a result of the dismantling of historic buildings.

Traffic and transport

6.59 In order to establish the baseline situation, traffic survey data was commissioned to establish vehicle flows for both the morning and evening peak periods for all junctions throughout the study area and supplemented by Welsh Government traffic data. A detailed site audit has also been undertaken of the local transport network, including opportunities for walking, cycling and public transport.

6.60 Throughout the construction phase, traffic will be generated associated with the transportation of construction plant and materials to and from the site. In addition, traffic will be generated by staff working on site, typically in cars and small vans.

6.61 Based on a summary of the Material Assumptions and HGV Calculations an initial assessment has been carried out to determine the likely number of HGVs generated per day throughout the construction phase of the development. This shows that the construction phase of the development is likely to generate a total of 9 HGVs throughout the day. Vehicle traffic associated with the construction staff is likely to be a maximum of 73 two-way vehicle trips in the AM peak period and a maximum of 73 two-way vehicle trips in the PM period.

6.62 The traffic associated with the construction phase will be lower than the predicted trip generation associated with the operation phase.

6.63 Regarding the operational phase, when the traffic related to the proposed development is added to the base surveyed flows, a number of links/junctions are likely to experience increases in traffic greater than 30%, including:

- Junction 1 - Admiralty Way/Meyrick Owen Way mini-roundabout
  - Admiralty Way (north)
  - Meyrick Owen Way
  - Whites Farm Way

- Junction 4 - Meyrick Owen Way/Market Street junction
  - Meyrick Owen Way (west)
  - Meyrick Owen Way (east)

6.64 Environmental impact assessments determined that severance, driver delay, pedestrian amenity and delay, fear and intimidation and accidents and safety during construction would be moderate adverse and minor adverse during operation, neither of which are considered to be significant.

Socio-economics

6.65 The strong presence of the energy sector in Pembrokeshire forms part of its economic baseline, which is currently heavily reliant on oil and gas resources. The future baseline scenario presented in this chapter points towards the need for the energy sector in Pembrokeshire to diversify towards renewable sources of energy, with the Proposed Development providing an opportunity to exploit one possible avenue of diversification.

6.66 Table 12.25 within Chapter 10 of the ES summarises the assessment of effects on economic receptors associated with the Proposed Development. The assessment of significance of effects has determined that the Proposed Development is likely to have a beneficial effect on economic receptors, ranging from Moderate to Major significance.

6.67 The Pembroke Dock Marine (PDM) project comprises four separate but interrelated elements that build on an emerging energy cluster around the Milford Haven Waterway: PDI, Pembroke Port Hangar Annexes, Marine Energy Test Area (META), Marine Energy Engineering Centre of Excellence (MEECE), and Pembrokeshire Demonstration Zone (PDZ). PDI is a key element of the PDM project. The integrated package of measures around PDM as a whole provides the range of supporting activity to maximise the beneficial effects on the Pembrokeshire economy.

6.68 On the basis of the impacts assessed in this chapter, there are no additional monitoring or mitigation measures required to minimise, reduce or offset the possible effects on the receiving environment i.e. the economy.

Ground conditions (geology, hydrogeology and contamination)

6.69 The assessment of ground conditions focuses on the likely effects of ground conditions and land contamination during the construction and operational phases of the Proposed Development..

6.70 The baseline ground conditions were established through completion of a Desk Top Study (DTS) and Preliminary Risk Assessment (which considered a series of previous ground investigations), supplemented by specific targeted further intrusive ground investigation to address any residual data gaps.

6.71 The assessments identified that the site is underlain by a variable thickness of Made Ground overlying bedrock of the Pembroke Limestone Group. The Pembroke Limestone Group is classified as a Principal Aquifer. A perched discontinuous groundwater table is present within the Made Ground, and a deeper continuous water table within the bedrock. The deeper groundwater is considered to be in continuity with the adjacent Milford Haven Waterway. Concentrations of a small number of contaminants exceed the selected criteria in relation human health and controlled waters. Ground gas concentrations were mildly elevated.

6.72 An assessment of demolition / construction and operational impacts has been undertaken based on the identified baseline conditions and the implementation of standard construction methods in accordance with a Construction Environmental Management Plan (CEMP). The assessment concluded that effects during the demolition / construction phase would range from no effect to minor effects. The assessment concluded that the effects during operation would be no effect to minor and recommended the inclusion of an engineered cap to further reduce the impact to future site users. The assessment further concluded that implementation of an ongoing groundwater programme would be prudent to demonstrate the low level of impact on controlled waters.

Landscape and visual impact

6.73 The potential landscape and visual effects resulting from the proposed development by Pembroke Dock Marine is set out in full at ES Chapter 14: Landscape and Visual Assessment.

6.74 The Proposed Development relates to the existing port functions located within the Milford Haven Waterway which is an integral part of Britain's oil and gas industry and one of the busiest ports in the UK. The landscape/seascape can be described as an intensely-used waterway scattered with commercial shipping, fishing boats and maker buoys. Port activities dominate, such as the Pembroke to Rosslare ferry, working tug boats and pilot vessels. Large jetty and slipways are common features along the waterway. Views to the west are dominated by the tall oil refinery structures, gas and petrochemical storage tanks and vertical element of the power stations elevated on the cliffs above the waterway edges. The Cleddau bridge, approximately 1.5 km to the north-east of the Application Site is also a prominent feature in the local landscape.

6.75 The Pembrokeshire Coast National Park (PCNP) lies approximately 3.1 km from the Proposed Development at its closest point. and cannot be seen from it. There are no statutory landscape designations associated directly with the Application Site.

6.76 The LANDMAP Visual and Sensory Aspect Layer for the area in which the Proposed Development is situated classifies the Application Site as Urban.

6.77 The design concept of the proposed buildings A and B, which functionally and operationally need to be large, draws inspiration from the 19th Century counterparts, in the heyday of ship building, and the form of the mansard-type envelope structures sitting over the `Slip-Docks`. The spirit of these great, single-volume structures with their unique scatter of roof lights, provide a distinctive appearance and it is this concept that has been used in the proposed structure. Panelisation of the side walls and use of scatter pattern of translucent panels refer to the slip-docks of old. The colour of the panels has been selected for historic and visual purposes to minimise mass of the proposed structures. At night the translucent panels provide a filigree of muted light.

6.78 The design of the Pembroke Dock Infrastructure project has followed an iterative process with respect to ameliorating landscape and visual effects. The careful design and location of the proposed buildings have been key factors in enabling the reduction of potential landscape and visual effects. The primary landscape qualities of all five Visual and Sensory Aspect Areas within the ZTV would be maintained. The Application Site would remain intact as a functional port and the Proposed Development would fit in with the dockyard context in which it is located.

6.79 The effects of the Proposed Development on walkers using the Wales Coast Path/Pembrokeshire Coast Path, visitors and on people engaged in recreational boating would be significant, but not unacceptable, given the context of the Proposed Development.

6.80 The change in views from agreed viewpoints were assessed. Those people experiencing the change in views from short and mid-range locations would experience significant effects. People at representative viewpoints further from the Proposed Development would experience both significant and insignificant effects. None of the effects would be unacceptable, given the context of the Proposed Development.

6.81 Due to the presence of existing lighting, the effect of the buildings to screen or replace some of that lighting, the significance of the effects of the night-time lighting is not considered to be significant.

6.82 As with any type of development, the Pembroke Dock Infrastructure project will give rise to local change in the visual character of the Application Site itself and to the views of people overlooking, visiting or walking through the area. However, the project is sited in a context where large-scale port buildings and energy infrastructure are common elements. The extent of change has been minimised through careful/sensitive design and the effects on landscape/seascape and visual resources and receptors is judged to be acceptable.

Hydrology and flood risk

6.83 The assessment of hydrology and flood risk focuses on the potential for increased flooding and watercourse disturbance as a consequence of the development.

6.84 The baseline hydrology and flood risk was characterised by a desk-top study of published sources of information and consultation.

6.85 Based on the information gathered, the environmental impacts of the development on hydrology and flood risk during construction and operation have been assessed, and mitigation measures that could minimise, reduce or prevent the possible adverse environmental impacts are proposed.

6.86 Welsh Government DAM and NRW Flood Zone mapping confirms that the site is within Zone A and Flood Zone 1 respectively. NRW has confirmed that the main source of flooding for the development area is tidal. Extreme tide level outputs indicate the site is at very low risk of flooding from tidal sources. Model outputs confirm that tidal levels for a 1 in 200 year event plus climate change could potentially reach approximately 5.87 mAOD. Compared against the lowest approximate site level of 6.0 mAOD flooding associated with the 1 in 200 year event plus climate change is not anticipated to impact the site.

6.87 In relation to Hydrology and Flood Risk a number of designed-in mitigation measures have been proposed to reduce the potential for impacts of the development. The measures are as follows:

- Surface Water Management Strategies, whereby any additional ‘clean’ runoff will be directed to the current drainage system and discharged directly to the estuary;
- Flood Management Plan - This plan is applicable throughout the construction phase, and include flood-warning measures for safe site evacuation;
- Construction Best practice measures (in line with the construction method statement);
- Water quality monitoring and Pollution Prevention measures; and
- Drainage maintenance plan and Emergency spillage management plan.

6.88 The potential effects that the development may cause are as follows:

- An increase in less permeable area which will in turn increase the surface water runoff within the Site.
- An increase in surface water flood risk within the Site and to adjacent land.
- An increase in turbid run-off and spillages within the Site potentially reduces the WFD classification (decrease in surface water quality) of nearby watercourses.
- Turbid water run-off / spills may have an effect on surrounding ecosystems.
- A disruption of on-site drainage networks due to heavy vehicle movement and construction.

6.89 The hydrology and flood risk impact assessment has determined that the development will have no significant effects on hydrology and flood risk following the implementation of appropriate and agreed upon mitigation measures.

Biodiversity

6.90 Much of the site comprises buildings bounded by concrete and asphalt hardstanding and compacted stone surfaced ground. There are some localised areas of scrub, grassland, woodland, individual trees and ruderal habitats within the site. A few areas of revegetating previously disturbed ground qualify as 'Open Mosaic Habitat' (OMH) which is a habitat of principle conservation importance in Wales. The most species-rich of these areas, located adjacent to the Graving Dock, is classified as having value in the context of the district. The other habitats within the site have ecological value only in site or local context.

6.91 There is a summer day roost of up to two common pipistrelle bats in building RSK B38 within the site. Outside of the site three buildings support summer day roosts for common pipistrelle and occasionally summer day roosts of brown long-eared bat, greater horseshoe bat, soprano pipistrelle and lesser horseshoe bat. All the off-site roosts have recorded use by individual bats or very small numbers of bats. One building is used as an occasional night roost by one lesser horseshoe bat.

6.92 The southern boundary of the site and adjacent off-site streets serve as potential bat flight lines providing connectivity between the site and the wider landscape for bats using on-site and nearby off-site roosts.

6.93 The otter population within the Milford Haven Waterway is a qualifying feature of the Pembrokeshire Marine SAC. An otter footprint was recorded in intertidal mud below the dock in 2015 indicating occasional activity at the foreshore.

6.94 The site lies within the territory of a badger social group. A single outlier sett within the site was closed under licence in 2018.

6.95 The site has negligible value for birds. Very small areas of adjacent mudflat could be used by small numbers of wader and waterfowl species that are qualifying species, populations of which occur within the Milford Haven Waterway SSSI and have high value.

6.96 The proposed development will result in the permanent loss of vegetated habitats within the site with the exception of some mature trees and a narrow strip of scrub, trees and ruderals/grassland on the southern boundary.

6.97 A linear area of green space along the southern boundary forms part of the masterplan. This will incorporate many of the retained mature trees within the site. In addition, plants and topsoil will be translocated to the linear green space from the OMH area at the Graving Dock. The linear green space will be subject to low intensity management to promote a naturalistic feel to the shrub planting and retained trees. Translocated herbaceous vegetation from the OMH will be managed as a pioneer habitat with the control of colonising scrub and ruderals to promote high species diversity.

6.98 Building RSK B38 will be demolished with the loss of a common pipistrelle summer day roost. This will be carried out under a EPS bat licence issued by Natural Resources Wales. . The licence method statement will specify the details of exclusion or soft demolition as appropriate to avoid harming bats. If necessary, the license method statement will also detail the provision of replacement roosts in advance of demolition. 16.265 Artificial lighting during construction and operation will be designed to avoid light spill onto the off-site buildings containing bat roosts, and their immediate surroundings.

6.99 Artificial lighting during construction and operation will also avoid light spill on potential bat flight lines along Fort Road and Catalina Avenue to the south of the site. The linear green space along the southern boundary will form a dark corridor to maintain and enhance the function of the southern boundary as a bat flight line. Retained trees and native shrub planting within the linear green space will create shelter potentially attracting flying insects further enhancing the value of this feature for bats.

6.100 There will be impacts of minor adverse significance during construction on OMH habitat, woodland/scrub, mature and semi-mature trees, and grassland. These are not significant in EIA terms.

6.101 In relation to protected species, there will be minor adverse impacts from construction on common pipistrelle bat, greater horseshoe bat, otter badger and birds using nearby off-site intertidal habitats. Again, these are not significant in EIA terms.

6.102 Construction impacts on all other ecological features will be of negligible significance.

6.103 With the control of light spill onto potentially sensitive features, and the maintenance/enhancement of the bat flight line on the southern boundary, residual operational impacts on greater horseshoe bats will be of negligible magnitude and significance.

6.104 A residual minor adverse impact on otter during operation is anticipated due to increased activity and artificial lighting on the foreshore. Otter are considered likely to traverse this area occasionally, but the impact will not be significant for the local otter population.

6.105 Operational impacts on all other ecological features will be of negligible magnitude and significance.

FIGURE 1

Notes

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Application Red Line

Other Ownership Areas

N

Rev	Description	By	CB	Date
D	Revised Red Line Plan	GG	DW	16/11/20
C	Revised Red Line Plan	GG	DW	17/07/19
B	Red Line Amendment	GG	DW	12/07/19

MAKING COMPLEX EASY

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Client: Milford Haven Port Authority

Project: Pembroke Dock Infrastruture

Title: Site Location Plan

Status	Drawn By	PM/Checked by
DRAFT	GG	DW

Job Ref	Scale @ A2	Date Created
JPW1115	1:2500	FEB 18

RPS Drawing / Figure Number: JPW1115-001

Rev: D

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FIGURE 2

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N

GATE 4 AREA

PEMBROKE DOCK FERRY TERMINAL (PDFT)

GATE 1 AREA

Application boundary
11.10 ha (27.43 acres)

Milford Haven Port Authority other land ownership

Land not in MHPA ownership

Land leased to PCC

Rev	Description	Date	Initial	Checked

MAKING COMPLEX EASY

Park House, Greyfriars Road, Cardiff, CF10 3AF
T: +44(0) 2920 668 662 **E:** rpsca@rpsgroup.com

Client: Milford Haven Port Authority

Project: Pembroke Dock Marine

Title: Application Site

Status	Drawn By	PM/Checked by
PRELIMINARY	AW/PO	DW

Job Ref	Scale @ A1	Date Created
JPW1115	1:1500	Jan 2018

Drawing Number	Rev
JPW1115-02	F

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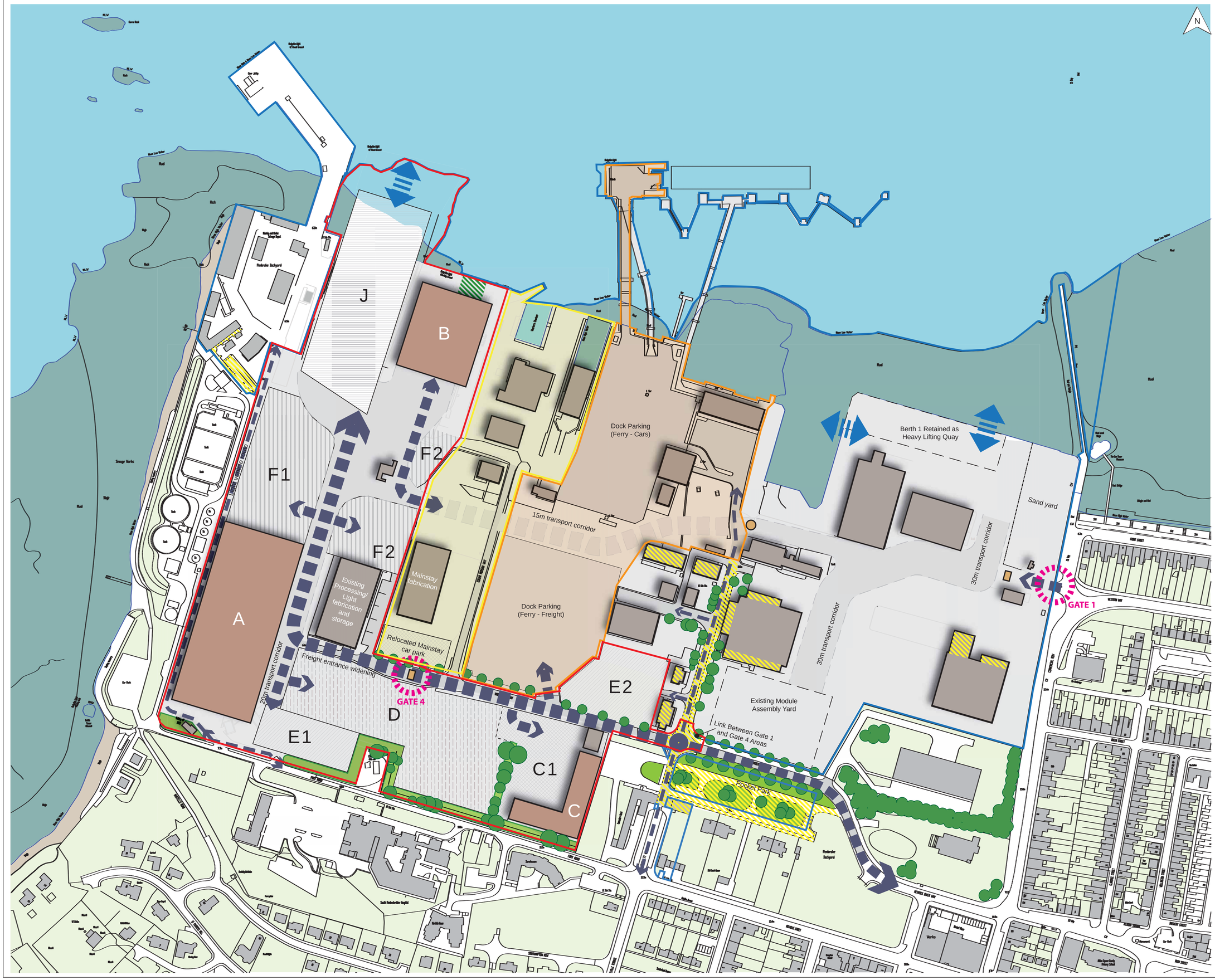
File path: 04 JOBS\01 OPEN JOBS\JPW11xx\JPW1115 - PEMBROKE DOCK MARINE\4. Drawings\1. RPS Drawings\A\1115-002 Existing Site Plan

FIGURE 3



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- Application boundary 11.10 ha (27.42 acres)
- Land Leased to Mainstay
- Ferry Terminal Area
- Proposed buildings
- Existing buildings to be retained
- Proposed transport corridor
- Ship Access
- Mean Low Water
- Mud/Mean High Water
- Proposed Multi-use laydown/ assembly yard Areas
- Security gate/ check point
- Temporarily Manned Security Point
- Key movement routes
- Landscaping
- 6m ecology corridor (including 1m maintanence footpath)
- Key Access Points
- Proposed Revetment
- Heritage Mitigation areas and enhancement (subject to seperate LBC applications)

Proposed High Quality Fabrication Facility
A – Fabrication building for sub-assemblies and marine engineering related activities (11,900sqm) – (170m X 70m and 40m to ridge)
F1 – External/open multi-use laydown and final assembly area (8,058sqm)
F2 – Existing external processing/open multi-use laydown and assembly area (4,836sqm)

Proposed High Bay Ship Repair and Fabrication Facility
B – High bay ship repair and fabrication building (4,900sqm) – (75m X 65m and 40m to ridge)

Proposed Slipway and Transition Area
J – Slipway and large open transition area (11,838sqm) – required to transfer completed components to the slipway and to allow large vessels to be moved to/from the high bay ship repair and fabrication building (Building B)

Proposed Light Assembly and Maintenance Facility
C - Light assembly and maintenance building (2,500sqm) – (129m X 20m and 10m to ridge)
C1 - Light assembly and maintenance external storage and parking area (5,000sqm)

Proposed Batching Plant
D – Open batching plant and storage area (12,937sqm)

Proposed Employee Car Park
E1 – Employee car park (3,040sqm)
E2 - Employee car park (4,853sqm)

The building sizes are indicative parameters only and will be adjusted to suit exact requirements.
The transport corridors will allow smaller completed modules or vessels to be transported to/from the existing heavy lift quay or partially completed sub-assemblies to be transported to/from the existing module assembly yard.
The light vehicle route is to allow access from Fort Road to the area occupied by Switzer.

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Client	Milford Haven Port Authority
Project	Pembroke Dock Marine
Title	Indicative Proposed Masterplan

Status	Drawn By	PM/Checked by
Draft	AW/PO	DW
Job Ref	**Scale @ A1**	**Date Created**
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Drawing Number		**Rev**
JPW1115-04		O

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