Hunterston Construction Yard
Volume 1: Environmental Impact Assessment

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PREFACE

This Environmental Impact Assessment Report (EIAR) has been prepared under the Town & Country Planning (Environmental Impact Assessment) (Scotland) 2017 Regulations ("the EIA Regulations") and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ("the marine EIA Regulations"). The EIAR has been prepared to support an application for Planning Permission to North Ayrshire Council (NAC) as well as applications for a marine construction and dredging licence to Marine Directorate Licensing Operations Team (MD-LOT)[1].

Hunterston Construction Yard (HCY) forms part of the Hunterston PARC masterplan. It is a relatively flat reclaimed area of land approximately 40 Ha in size (800m x 500m at its widest point) which is accessible from the A78 via the Hunterston Roundabout and power station road leading onto Oilrig Road. It is a promontory which extends out into the Firth of Clyde with Hunterston Power Stations ~1km to the south, Fairlie village ~1.9km to the northeast, the island of Great Cumbrae ~1.4 km to the northwest and the redundant Hunterston Coal Terminal ~500m to the east. The Southannan and Hunterston Sands Sites of Special Scientific Interest (SSSI) bound the site to the northeast, east and southeast.

HYC is operated by Clydeport Operations Ltd. (Clydeport) who are the Statutory Harbour Authority for the Clyde area. The intension is to modernise the site into a facility suitable for use by the off-shore renewable / green energy industries. As HCY has a "Certificate of Lawful Use", the planning and marine license applications relate to the enabling phase of the proposed development only, which includes:

- The construction of a new quay and associated quayside infrastructure on the western edge of the site to berth vessels;
- Works include removal of the existing dock entrance bund, and/or removal of existing land to facilitate the construction of appropriate berths;
- Demolition works of existing structures including removal of the base of the former dry dock;
- Infilling of the former dry dock basin to provide additional land for general industrial purposes;
- Ground improvement works including piling;
- Dredging (including future maintenance) to enable marine vessel access to quay areas;
- Provision of site utilities and any required foundations within storage areas; and
- Erection of temporary site offices and staff welfare buildings to accommodate site workforce.

The main purpose of this facility would be to undertake multiple industrial activities that require both deep-water berthing and large laydown area. It is envisaged that the main activity will be to support the offshore wind industry for activities potentially including gravity-based structure construction, jacket construction, turbine assembly, and associated activities including the storage of components.

This EIAR reports the findings of an Environmental Impact Assessment (EIA) which has been co-ordinated and written by EnviroCentre Ltd, with specialist input from technical co-consultants.

This EIAR comprises the following elements:

- Volume 1: Environmental Impact Assessment Report
  - Providing a detailed description of the proposed development and its potentially significant environmental effects, detailing alternative options where applicable, reporting the findings of the EIA, as well as any proposed mitigation measures and providing other relevant background information;
- Volume 2: Relevant figures and plans too large to be presented within Volume 1; and
- Volume 3: Technical Appendices.
  - Containing detailed technical reports and baseline studies which act as background reports to Volume 1.

The following documents have also been prepared to support the application. These form part of the overall consent application submissions, but they do not form part of the EIAR:

- Planning Application;
- Planning Support Statement;
- Planning Application Consultation Report;
- Marine Construction Licence Application – the application for construction in the marine environment is required to consent activities up to Mean High Water Springs (MHWS); and
- Dredging Licence Application – the dredging application is required to consent the removal of sediment from the marine environment and disposal to a licensed sea disposal site (if sediment is unsuitable for beneficial reuse).

A Non-Technical Summary (NTS) has also been prepared which is a condensed synopsis of the EIAR.

Electronic copies of the NTS and EIAR can also be downloaded from https://www.hunterstonparc.com/.

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[1] Previously called Marine Scotland Licensing Operations Team (MS-LOT)

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1 INTRODUCTION

1.1 Terms of Reference

EnviroCentre Ltd has been appointed by Arch Henderson on behalf of Clydeport Operations Ltd., to undertake an Environmental Impact Assessment (EIA) in relation to the upgrade of the existing Hunterston Construction Yard (HCY) into a harbour facility with a large working platform suitable for renewable industries. This Environmental Impact Assessment Report (EIAR) comprises the written findings of the EIA process undertaken under both the Town & Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA Regulations') and the Marine Works (Environmental Impact Assessment (Scotland) Regulations 2017 ('the Marine EIA Regulations').

1.2 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance or legislation in the intervening period are integrated into an updated version of the report.

Whilst the Client has a right to use the information as appropriate, EnviroCentre Limited retains ownership of the copyright and intellectual content of this report. EnviroCentre Limited does not accept liability to any third party for the contents of this report unless written agreement is secured in advance, stating the intended use of the information.

EnviroCentre Limited accepts no liability for use of the report for purposes other than those for which it was originally provided, or where EnviroCentre Limited has confirmed it is appropriate for the new context.

1.3 The Applicant and Background

Clydeport Operations Ltd. (Clydeport) are the Applicant for the proposed development.

Clydeport are a subsidiary of Peel Ports Ltd. and the Statutory Harbour Authority (SHA) for the Clyde area. Clydeport's operational marine division runs key ports on the West Coast of Scotland providing a wide range of port facilities and associated services.

1.4 Regulatory Context

The proposed development transcends two separate regulatory regimes; namely, development control in accordance with the provisions of the Town and Country Planning (Scotland) Act 1997, which applies to development in, on, over or under land (where the land extends seawards as far as mean low water on spring tides (MLWS)), and marine licensing in accordance with the provisions of the Marine (Scotland) Act 2010, which applies to licensable marine activity either in the sea or on or under the seabed (where the sea within the Scottish marine area extends landwards as far as mean high water on spring tides (MHWS)). The boundary of each regulatory regimes in relation to the proposed development is shown in Arch Henderson Figure HMY-AHN-00-00-DRC-0001 provided in Volume 2 of this EIAR. The respective regulatory regimes are administered by North Ayrshire Council (terrestrial) and MD-LOT (marine).

The EIAR has been produced to support consent applications for development (i.e. planning permission) and licensable marine activities (i.e. marine licences for marine construction works, dredging works, and disposal of dredged material at sea), as described below.

Planning permission is being sought for development including the following activities:

- Demolition of existing structures;
- Infilling of the dry dock to form a working platform;
- Formation of 450m quay wall 500mm back from MHWS i.e. in the terrestrial environment;
- Formation of a temporary working platform;
- Removal of the existing rock armour on the western boundary;
- Removal of the existing bund on the western boundary;
- Installation of sub-surface revetments for the new quay wall;
- Installation of fenders and other quay wall infrastructure i.e. drainage outfalls, mooring bollards, safety ladders and navigational aids ;
- Erection of port infrastructure including lighting columns, substations, drainage, security fencing, access gates, access road improvements (including resurfacing) and CCTV; and
- Erection of temporary site offices and staff welfare buildings to accommodate site workforce.

Marine licences are being sought for the following activities:

- Formation of a temporary working platform;
- Removal of the existing rock armour on the western boundary;
- Removal of the existing bund on the western boundary;
- Installation of sub-surface revetments for the new quay wall;
- Capital Dredging to a depth of -12m CD to enable access to the 450m quay wall;
- Disposal of dredging spoil to a licensed marine spoil disposal site;
- Construction of up to 5 mooring dolphins;
- Installation and removal of a temporary grounding pad to facilitate vessel birthing as required;
- Installation of fenders and other quay wall infrastructure i.e. drainage outfalls and safety ladders; and
- Installation of navigational aids.

With the proposed upgrades in place, the site will be available for a tenant(s) to undertake future activity at HCY, which is expected to focus on construction and/or integration of offshore wind components. The exact nature of future activity is unknown at the time of preparing the EIAR and, therefore, is not covered by the EIAR. However, future activity at HCY – and development associated with the implementation of future activity at HCY - will be subject to development control and/or marine licensing (and, if required, environmental assessment) where that future activity and/or development associated with that future activity is not covered by the provisions of existing consents relevant to HCY. Existing consents include the Clyde Port Acts and Orders 2021 which set out Clydeport's administrative powers relating to port activity at HCY, planning consent N/16/00268/PP as amended by N/17/01273 which permit construction, repair and decommissioning of large marine-related structures at HCY, and Certificate of Lawful Use 22/00717/CLE which permits general industrial use at HCY.

1.5 Structure of the EIAR

The EIAR is presented within three volumes, which are set out within Table 1.1 below:

Table 1-1: Structure of the EIAR

Item	Description	Author
Volume 1: Environmental Impact Assessment Report		

Item	Description	Author
Chapter 1: Introduction	This chapter sets the context for the EIA and introduces the proposed development in a broad context	EnviroCentre
Chapter 2: Proposed Development	This chapter sets out the proposed development description upon which the environmental assessment is based, as well as examining design and alternatives considered.	EnviroCentre (with marine engineering input by Arch Henderson)
Chapter 3: Planning Context	This chapter assesses the level of compliance of the proposed development, drawing upon the evidence contained within the EIAR, in relation to land-use planning policies and marine planning.	Cameron Planning and EnviroCentre
Chapter 4 EIA Methodology and Scoping	This chapter introduces the EIA methodology by which the proposed development was designed, along with an outline of how the EIAR has responded to comments throughout the process.	EnviroCentre
Chapter 5: Biodiversity	Chapter 5 assesses the impact of the proposed development upon biodiversity including terrestrial mammals, marine mammals, ornithology, benthic fauna, designated sites and fish.	EnviroCentre
Chapter 6: Seascape, Landscape and Visual	This chapter deals assesses the visual impact to the seascape and landscape associated with the proposed development	Sweco
Chapter 7: Terrestrial Noise	This chapter deals with issues associated with potential noise impacts associated with the proposed development	EnviroCentre
Chapter 8: Traffic Assessment	This chapter details the assessment of the proposed scheme's likely effects on traffic as a result of the proposed development	Sweco
Chapter 9: Water Environment	This chapter details the assessment of the proposed developments impacts on the water environment including potential impacts to the coastal processes and from proposed dredging works	EnviroCentre
Chapter 10: Socioeconomic and Human Health	This chapter details the assessment of the proposed developments impacts on socioeconomics and human health.	Sweco
Chapter 11: Accidents and Natural Disasters	This Chapter details assessment of the proposed development with respect to considerations associated with Accidents and Natural Disasters	EnviroCentre
Chapter 12: Navigation	This Chapter is informed by a Navigational Risk Assessment which is provided as Technical Appendix 12.1, Volume 1 of this EIAR.	ABPmer
Chapter 13: Supporting Information	This chapter covers areas of the environment which are important to note but have not been identified as having potentially significant effects throughout the EIA process (as detailed within Chapter 3: EIA Methodology and Scoping). These include Air Quality, Carbon Assessment, Material Assets and Waste	EnviroCentre
Chapter 14: Schedule of Mitigation	This chapter sets out a summary of all mitigation measures proposed within the EIAR within a schedule which can then be used to inform a Construction Environmental Management Document (CEMD).	EnviroCentre
Chapter 15: Summary of Effects	This chapter summarises the key findings of the EIAR, discusses CEMD principles, and provides a Statement of Significance in relation to the proposed development.	EnviroCentre
Volume 2: Figures	This volume provides the figures relevant to each chapter within Volume 1 and is provided as a standalone volume to aid comparative assessment.	All
Volume 3: Technical Appendices	This volume provides the relevant technical background papers and studies which have informed each chapter.	All

1.6 Objective and EIA Context

The purpose of an EIA is to identify and evaluate the likely significant effects of a proposed development on the environment and to identify measures to mitigate or manage any significant adverse effects before a regulator grant's planning permission or a marine licence. The EIA process provides an opportunity to 'design out' significant adverse effects wherever possible. However, where significant adverse effects cannot be designed out, mitigation in the form of avoidance, minimisation, rectification (or restoration / reinstatement) or compensation (or offsetting) measures are proposed to reduce significant adverse effects to acceptable levels where reasonably practicable. EIA is an iterative process which allows feedback from stakeholder consultation and the results from environmental baseline and impact studies to be fed into the design process of the proposed development.

The objectives of the EIAR are:

- To establish a robust environmental baseline upon which to base environmental assessment, incorporating field surveys, desk study and consultation;
- To provide an assessment of the potential environmental impacts of the proposed development and to determine which of these, if any, are likely to result in a significant effect on the receiving environment; and

- Where significant effects are predicted, to determine mitigation measures to reduce the residual effects to acceptable levels where reasonably practicable.

The results and findings of the EIA are presented in this EIAR. The environmental information presented is derived through a systematic process of identification, prediction and evaluation of the likely significant environmental effects of the proposed development, and covers the information required by the EIAR Regulations and the Marine EIA Regulations.

This EIAR meets these requirements within each technical chapter, with the description of the proposed development provided in Chapter 2, and a description of EIA methodology set out Chapter 3.

1.7 The Project Team

The EIA carried out in relation to the proposed development has been undertaken by specialist environmental and technical consultants as provided in Table 1-2.

Table 1-2: Project Team and Competent Expertise

Project Role	Organisation	Lead Author & Reviewer	No. of Years' Experience	Qualifications & Professional Memberships
Inputs to EIA Process				
Project Director	EnviroCentre	Graeme Duff	21+	BSc (Hons), MSc, CSci FGS
Project Manager	EnviroCentre	Emma Cormack	21+	BSc (Hons), MIEnvSc
Project Co-ordinator	EnviroCentre	Jeet Shah	7+	BEng, MEng, MIEnvSc
Planning	Cameron Planning Ltd.	Steven Cameron	20+	BA, MSc
Engineering – Project Director	Arch Henderson	Alan Kilbride	30+	BSc, CEng
Engineering – Project Manager	Arch Henderson	Keith MacNair	30+	Beng (Hons)
Volume 1: Environmental Impact Assessment Report				
Chapter 1, 2,4,11,12 and 13	EnviroCentre	Emma Cormack	21	BSc (Hons), MIEnvSc
Biodiversity	EnviroCentre	Gemma Nixon	10+	MSc, CEcol, MCIEEM
Ornithology	EnviroCentre	Matthew Sullivan	17+	MSc, ACIEEM
Water	EnviroCentre	Martin Nichols	12+	BSc, MSc, CIWEM
Underwater Noise Modelling	RPS	Rasmus Sloth Pederson	9+	BSc, MSc
Seascape, Landscape & Visual	SWECO	Phillip Black	20+	BA (Hons)
Terrestrial Noise	EnviroCentre	Andrew Hood	9+	MSc, MIOA
Carbon Impact Assessment	SWECO	Elle Bartleet	4+	BSc (Hons), MSc
Socio-Economics and Human Health	SWECO	Bryony Turner	20+	BSc (Hons) MSc, EngD
Transport	SWECO	Ruth Mustard	21+	MEng, MSc, MCIHT
Accidents and Natural Disasters	EnviroCentre	Ian Buchan	21+	BSc (Hons), PhD, FIEnvSc, CMILT
Navigation	ABPmer	Timothy Aldridge	13+	BSc

2 PROPOSED DEVELOPMENT

2.1 Introduction

Clydeport are considering their options for developing HCY to support the long-term future of offshore wind and other commercial ventures at the site. The company has identified that upgrading the HCY into a harbour facility with a large working platform will better support the needs of future tenants.

The remainder of this chapter describes the need for the development, alternatives considered, how the design has been developed, and activities associated with the construction and operation of the proposed development.

Note – For the purposes of this EIAR, operational activities are defined as being those that are related to the existence of the proposed development; that is, the existence of the upgraded HCY. Operational activities do not include operational activities related to future activity at the upgraded HCY: as noted in Section 1.4, the nature of future activity is unknown at the time of preparing the EIAR and, therefore, is not covered by the EIAR.

2.2 The Site and Surrounding Area

2.2.1 The Site

The site is a relatively flat area of land approximately 40 Ha in size (800m x 500m at its widest point). It is accessible from the A78 via the Hunterston Roundabout and Power Station Road leading onto Oilrig Road. The site is centred at Grid Reference NS 185 530.

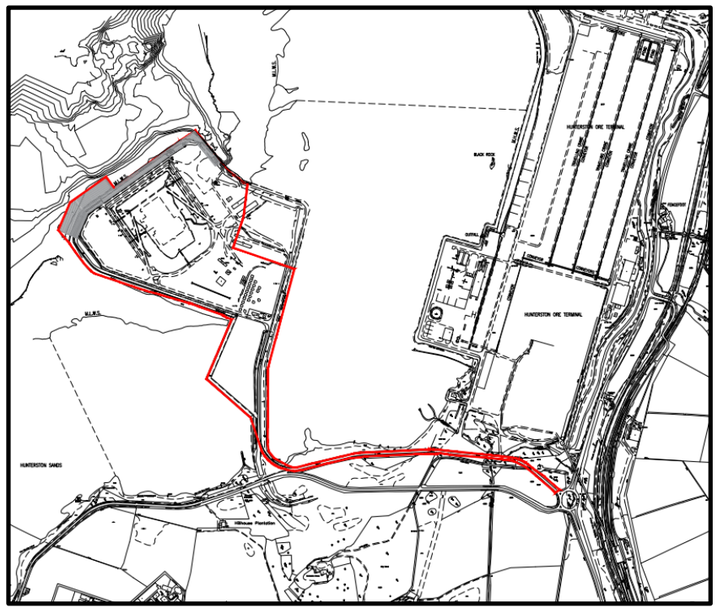


Figure 2-1: Site Location and Planning Application Boundary

HCY has historically been used for industry and currently comprises an access road, service infrastructure, deep dry dock (approximately 20m deep) cut off from the Firth of Clyde by a sand bund and a hammerhead quay, the site is armour stone protected. HCY was constructed in the 1970s by infilling onto Hunterston and Southannan Sands. The yard was used to manufacture an oilrig base, dry dock (Refer to Plate 2-1) and a gravity base tank prior to falling out of use in circa 1996. More recently, the site has been used as a wind turbine test site, however these features have been removed.

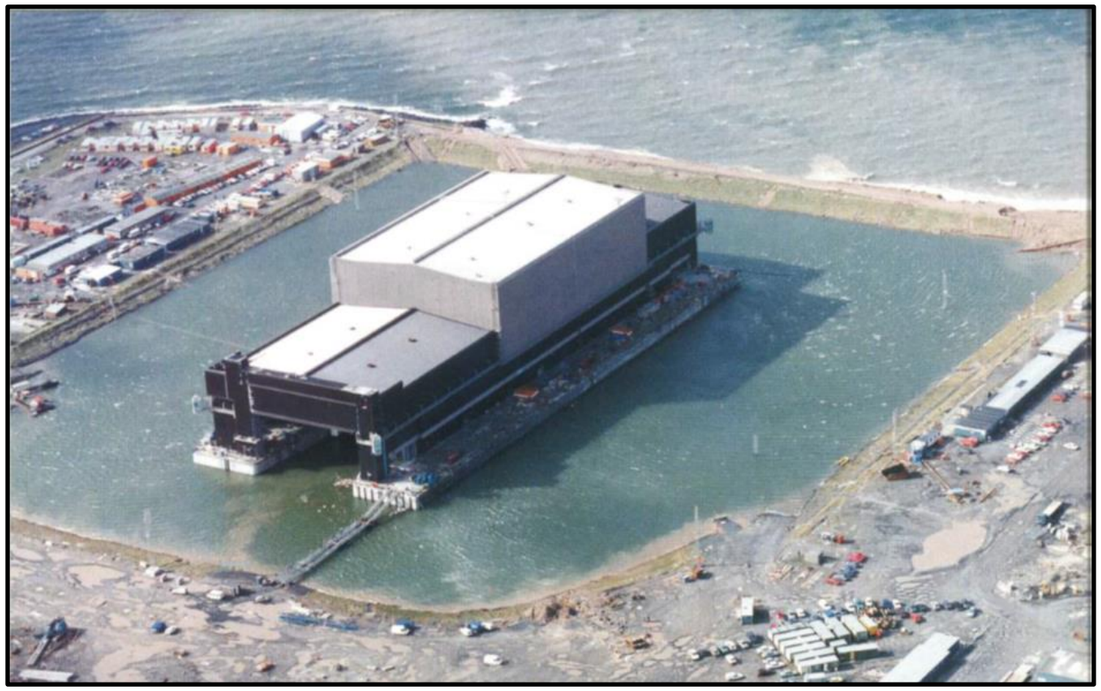


Plate 2-1: Historical Photograph of Operations at HCY

A marine decommissioning company approached Clydeport with a proposal to lease the site for off-shore decommissioning projects in circa 2017. This subsequently resulted in planning permission being granted to replace and enlarge the existing hammerhead quay (ref N18/00134/PP) and construct caisson gates (N18/00132/PP) in 2018. A Section 42 application was also submitted at that time (ref N17/01273/PP) to vary Condition 1 of Planning Permission (ref 16/00268/PP) to include decommissioning of large marine structures as well as construction and repair of same. A Waste Management License (WML) (Ref WML/L/1173385) was also granted by SEPA for decommissioning of off-shore marine structures in 2019 although this was never activated. For a number of reasons, the proposal to use the site for decommissioning purposes was not taken forward.

The site is currently vacant although Smart Green Shipping Alliance Ltd has been granted planning permission (No N/22/00979/PP) for the establishment of a Fastrig Wind Sail Test Facility on the south western corner of the site which covers temporary buildings (including a workshop, storage, office, canteen and WC), access, parking and other infrastructure. It is a temporary permission ending within 24 months from 24th January 2023.

2.2.2 The Surrounding Area

The site is located on a promontory which extends out into the Firth of Clyde with Hunterston Power Stations ~1km to the south, Fairlie village ~1.9km to the northeast, the island of Great Cumbrae ~1.4 km to the northwest and the redundant Hunterston Coal Terminal ~500m to the east. The Southannan and Hunterston Sands Sites of Special Scientific Interest (SSSI) bound the site to the northeast, east and southeast.

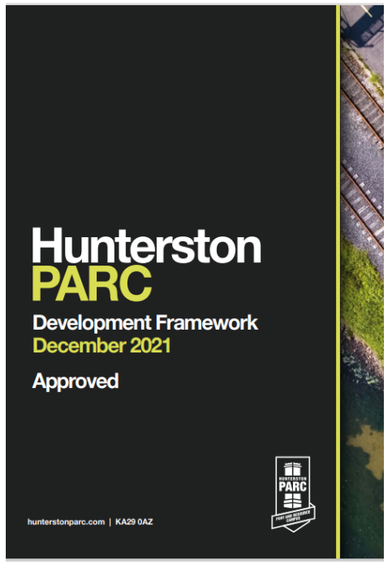
Part of the north eastern area of the promontory has been leased to Bakkafrost Scotland who intend to develop a Recirculating Aquaculture System (RAS) for rearing salmon smolt. Planning permission (No N/23/00606/PP) has been granted for preparation works, establishment of a compound area and initial groundworks including landscaping and other required infrastructure. A planning application for the aquaculture facility will be submitted to NAC at some point in the future.

Within the redundant Hunterston Coal Yard, Highview Power Ltd has been granted planning permission (N/23/00744/PP) for the development and operation of a grid stability facility in the south eastern area of the yard. XLCC has also been granted planning permission in principle and approval of reserved matters (/22/00133/PPPM and N/22/00712/MSCM) covering the majority of the yard for the erection of a high voltage cable manufacturing facility, including detailed planning permission for the construction of a 185m high tower with associated factory, research and testing laboratories, offices with associated stores, transport, access, parking and landscaping with on-site generation and electrical infrastructure and cable delivery system.

2.3 The Need for Development

The North Ayrshire Local Development Plan adopted by the council in 2019 identifies that the area suffers from poverty in some communities with significant numbers of the population travelling out with the area for work on a daily basis amongst other things. It is supportive of Hunterston becoming a key employment location through maximising its economic potential of the port's access to marine, road and rail networks.

In September 2021, Clydeport issued the Hunterston PARC Development Framework for consultation purposes. The development framework focused on the repurposing of the HCY and the former Hunterston Coal Terminal which comprises 320 acres of brownfield land within a land holding of 1,000 acres. It also has the deepest sea entrance on the west coast of the UK which gives it a strategic advantage of accommodating the largest capacity sea vessels and handling bulk cargoes such as gravity-based structures (GBS) used by offshore wind industry.



The development framework sought the views of interested parties on how to maximise the commercial use of the site through consideration of appropriate future uses/markets in conjunction with the optimal layout. The development options focused on providing a facility that would support the blue/green economy. The framework was approved by North Ayrshire Council Planning Committee in December 2021. Further information about Hunterston PARC development framework can be viewed at https://www.hunterstonparc.com/.

As part of the development framework optioneering it was identified that the modification of HCY through demolition and infilling of the existing dry dock and provision of a new quay on the western side of the site would provide a facility suited primarily for the renewables sector and specifically the offshore wind industry. Potential activities identified include GBS construction, jacket construction, turbine assembly, and associated activities including the storage of components.

2.4 Consideration of Alternatives

2.4.1 Introduction

The section details the reasonable alternatives studies undertaken for the proposed development and gives an indication of the main reasons for selecting the chosen option.

2.4.2 Alternative Development Locations

With respect to the proposed development, assessment of potential development locations within the wider Hunterston estate was undertaken.

Option 1

The HCY benefits from having existing port infrastructure in place and has immediate access to deep water. The HCY also has an existing area of available land which can provide a suitable working and storage platform for the operation as a port facility.

Option 2

There is existing development land located within the former coal terminal area. Like the HCY this benefits from having a large potential working and storage platform area, however there is no existing port infrastructure present in this area and no direct access to deep water. To facilitate this there would require to be extensive marine and civil engineering works including work that would directly impact the existing Southannan Sands SSSI.

Option 3

The existing deep water jetty at Hunterston provides access to deep water and has existing port infrastructure. The jetty however does not have an existing large storage and working platform area in close proximity, to provide this would result in significant land reclamation works.

Preferred Option

On the basis of the review of the development areas within the Hunterston estate, the HCY is the preferred location as it presents the lowest potential for environmental impact to achieve the requirements for the proposed development.

2.4.3 Alternative Project Designs

As part of the project design works since scoping stage three options have been identified for the development through iterative design stages of the project. These include:

Option 1

Creation of a 570m long quay wall on the western edge of the site with associated dredge pocket (as detailed in Arch Henderson Drawing No HMY-AHN-00-00-DR-C-9100, Volume 2 of the EIAR).

Option 2

Creation of a 450m long quay wall on the western edge of the site (as detailed in Arch Henderson Drawing No HMY-AHN-00-00-DR-C-9111, Volume 2 of the EIAR).

Option 3

Creation of a 250m long quay on the western edge of the site with associated dredge pocket (as detailed in Arch Henderson Drawing No HMY-AHN-00-00-DR-C-9110, Volume 2 of the EIAR).

The Preferred Option

Option 2 was selected as it mitigates potential significant environmental effects on designated sites e.g. reduces the distance from the quay wall to the sites, and it is of sufficient size to provide suitable access to the proposed development facility.

2.4.4 Alternative Construction Methods/ Sequences

As part of the iterative design process there has been a review of options in relation to the construction approach and in particular the methodology for the infilling of the dry dock. This incorporated the following options.

Dry Dock Infill Option 1

Dry dock infill option 1 incorporates removal of the existing bund at the dry dock entrance to allow for import and placement of infill material via rainbowing utilising a dredger. As part of this approach the dry dock would be reconnected to the Firth of Clyde and the works themselves would require a Marine Construction Licence in relation to the infilling activity. The quay wall infrastructure would be subsequently built incorporating overwater piling.

Dry Dock Infill Option 2

Dry dock infill option 2 incorporates retaining the existing bund and placement of material in the dry dock, it is assumed that this will be pumped ashore from a dredger. The infill activity would therefore not require a Marine Construction Licence however reuse of any wastes as part of the process would be regulated by SEPA under waste management controls. Any related discharge of water as a part of this infilling activity would be regulated by SEPA as a trade effluent discharge. In this scenario the quay wall would be installed through the existing bund with the material removed from in front of the quay wall as one of the last stages of the proposed development.

The Preferred Options

In consideration of potential impacts associated with the infill options it was considered that Option 2 was the preferred methodology as it will have lower potential impacts to the environment as the infill material is isolated from the water environment through the infilling works. As such the potential for release of suspended sediment as a result of the works is controlled and managed under SEPA licence requirements.

2.5 The Proposed Development – Design and Construction Works

2.5.1 Introduction

The proposed development is to upgrade HCY into a harbour facility with a large working platform to support the needs of future tenants, with a focus on facilitating the construction and/or integration of offshore wind components.

On the marine side, it will comprise a quay wall for the safe mooring of vessels and the loading / offloading of cargoes and materials (e.g., offshore wind components), and a deepened seabed for the safe navigation and manoeuvring of vessels to and from the quay wall. The quay wall will comprise a piled, tied and filled cofferdam structure topped with a concrete slab deck and finished with mooring bollards, fenders, ladders, utility provisions, and aids to navigation. The deepened seabed will comprise a dredged area where the bathymetry is lowered to approximately 12m below Chart Datum to provide sufficient water depth for navigation and berthing.

On the land side, the working platform will comprise approximately 40 hectares of compacted and levelled land situated behind the quay wall (including an area where the existing dry dock is infilled), utility provisions including a substation, perimeter fencing, access, CCTV and lighting.

2.5.2 Assessment Envelope

Section 1.4 details the actual elements that are included as part of the Planning Application and Marine Directorate Construction Licence Application.

As noted in Section 2.4.3 the preferred quay wall option for the development is a 450m long. The quay wall requires flexibility in relation to its positioning on the western edge of the HCY, to allow for this flexibility the EIAR has been based on a 570m long quay wall with associated dredge area. This therefore provides a worst case scenario assessment area to cover the potential design envelope of the 450m option

The Proposed Development assessed within the EIAR that represents this worst-case option incorporates the following elements:

- Demolition of existing structures;
- Infilling of the dry dock to form a working platform;
- Formation of 570m quay wall 500mm back from MHWS i.e. in the terrestrial environment;
- Formation of a temporary working platform;
- Removal of the existing rock armour on the western boundary;
- Removal of the existing bund on the western boundary;
- Installation of sub-surface revetments for the new quay wall;
- Installation of fenders and other quay wall infrastructure i.e. drainage outfalls, mooring bollards, safety ladders and navigational aids ;
- Erection of port infrastructure including lighting columns, substations, drainage, security fencing, access gates, access road improvements (including resurfacing) and CCTV; and
- Erection of temporary site offices and staff welfare buildings to accommodate site workforce.
- Capital Dredging to a depth of -12m CD to enable access to the 570m quay wall;
- Disposal of dredging spoil to a licensed marine spoil disposal site;
- Construction of up to 5 mooring dolphins;
- Installation and removal of a temporary grounding pad to facilitate vessel birthing as required;
- Installation of navigational aids.

2.5.3 Enabling Works

The enabling works will comprise:

- Site Clearance, demolition and crushing/screening of arisings;
- Contractor compound set up;
- Environmental mitigation measures deployed/established;
- Improvements to Oil Rig Road (including resurfacing); and
- Temporary fencing, gate, lighting and potentially CCTV installed.

2.5.4 Infill of the Dry Dock

It is anticipated circa 1.3 million m^3 of suitable fill material will be required to infill the dry dock, including surcharge material. As noted above research is being undertaken to identify other dredging projects within the area in which the sediment is identified as being suitable for use as in fill material. It is envisaged that a possible source for the additional infill materials will come from routine maintenance dredging activities of the Clyde. All infill material will be brought to site by barge.

It is anticipated that the construction works will consist of the following elements:

- Removal of the concrete base from the dry dock;
- Infilling of the dry dock utilising suitable engineering fill;
- Dewatering of the dry dock prior to and during infilling using pumps and generators;
- Material above MHWS to be compacted and additional bearing piles installed, if required; and
- Final platforming of the whole site area.

The infilling works will be carried out whilst the existing entrance bund to the dry dock is in place (i.e. the dock will remain above MHWS during the infilling activity).

Dependant on final loadings and the nature of the infill material, this area will require implementation of ground improvement techniques to accommodate operational loads for future land use. Improvement techniques considered include primarily piling of the area, but pending on engineering development can involve the use of soil mixing techniques as well. Piled foundations may take the form of vertical steel or reinforced concrete piles driven into the ground to provide stability for any superstructures above ground i.e. buildings, hardstanding, etc. Soil mixing enhances the engineering properties of soils and reinforces soil masses by mechanically mixing the in-situ soils with a binder slurry (typically comprising either cement or bentonite slurry or a combination of the two), creating strengthened and stiffened individual 'soilcrete' elements, commonly called panels. Out with the footprint of potential substructures, ground improvement will not be required for ground stability.

Note: Some materials are likely to be delivered to site by road for specific aspects of the works i.e. surfacing material.

2.5.5 Quay Wall

Generally, the structure will take the form of a tied cofferdam wall consisting of a combined wall to the front and rear, made up of large diameter steel tubular piles with steel sheet piles between. The front wall will be connected to the rear wall using steel tie rods. The tubular piles that will form the cofferdam wall will be approximately 40m long, driven to refusal / into rock in order to create sufficient deep water berthing options to support future operations – subject to final design load requirements. Additional tubular piles may be installed within the structure in order to allow increased loads in specific areas.

Whilst the Planning Application and Marine Directorate Construction Licence Application incorporate the construction of a 450m quay wall the EIAR assessment has been progressed to assess the worst case option of a 570m quay wall. This incorporates construction of a 450m quay wall with an additional 120m long angled quay wall on the south west to provide a total quay length of 570m. Sub-sea revetments will finish the quay wall at each end (i.e. southwest and northern ends) (refer to Arch Henderson Drawing Nos HMY-AHN-00-00-DR-C-9100 and HMY-AHN-00-00-DR-C-9101, Volume 2 of this EIAR for quay wall construction details). The approach to the EIAR is therefore considered to represent a conservative assessment with respect to the actual development application.

The seaward facing quay wall will be installed in the existing sand bund which forms the western bund 500mm back from MHWS (i.e. within the terrestrial environment) and it is anticipated will follow the following sequence of works:

- Tubular piles being vibrated/driven, vertically by impact techniques into deep strata. These piles may need fixed into the underlying rockhead by means of a rock socket. This may be formed by boring beyond the tubular pile toe into competent material, thus providing a socket in which some form of reinforcement can be placed and filled with concrete, providing a connection between the rockhead and the toe of the pile;
- Sheet piles installed vertically between the steel tubular piles. Sheet piles expected to be driven to shallower depths than the tubular piles;
- Anchor piles constructed behind the tubular piles;
- Removal of rock armour in front of the existing sand bund down to -10m CD and storage of rock;
- Local excavation of the existing bund at the west of the dry dock down to +2.0m CD to allow either horizontal or inclined tie rods installation;
- Installation of sub-sea revetments at either end of the quay wall;
- Reinforced concrete capping beam installed to complete the quay wall; and
- Provision of a concrete relieving slab, which may also require to be piled depending on loadings.

The quay wall will incorporate fenders, drainage outfalls, navigational aids and lighting.

2.5.6 Capital Dredge and Disposal

Capital dredging will be required to remove the sediment in front of the new quay wall to -12m CD (this will include the removal of sediment from the existing sand bund). Full details of the sediment characterisation (i.e. its physical and chemical status) of the existing sediment in the dredged area is provided in the Best Practicable Environmental Options (BPEO) report (refer to Technical Appendix 9.2, Volume 3 of this EIAR).

The majority of the capital dredging works will be undertaken utilising a trailer suction hopper dredger. There is potential that a backhoe dredger may also be utilised as part of the dredge campaign for removal of specific materials such as hard sediment deposits, it is likely that these works will be mainly in the vicinity to the existing quay wall including removal of rock armour.

The dredge volume associated with the 570m quay wall that is being assessed for the EIAR is 1,546,660m^3. As noted in Section 1.3 the actual application is for a 450m quay wall with an associated dredge volume of 1,162,033m^3. As discussed in Section 2.4 the EIAR is therefore considered to represent a worst case scenario with respect to assessment of the capital dredging activities.

As identified in the supporting BPEO report (Technical Appendix 9.2, Volume 3 of this EIAR), where possible beneficial reuse of the dredge arisings will be undertaken. Where the dredge material from the site is not considered to be geotechnically suitable or the proposed development programme does not align to facilitate reuse of the material then disposal at an offshore licensed disposal ground will be undertaken.

The nearest offshore disposal sites in the vicinity of the proposed development are listed in Table 2-1.

Table 2-1: Currently Open Sites for the Offshore Disposal of Dredged Material

ID	Name	OSGB36		Direction from Site	Approx. Distance from Site (km)
		Latitude	Longitude		

MA016	Rothesay Bay	55.85	-5.05	North West	19
MA017	Brodick	55.61666	-4.99488	South West	15
MA019	Birch Point	55.61666	-4.99068	South West	15

Dredging duration assessed within the EIAR is estimated to take 130 days. Due to the nature of dredging operations, it will be a 24 hour, 7 day a week operation.

2.5.7 Mooring Dolphins

A series of mooring dolphins (up to 5) will be constructed to assist in berthing / mooring of barges along the quay wall. The construction works will incorporate overwater piling including development of temporary platforms to facilitate the construction . Given the small footprint of the proposed structures it is not considered that these would present impact with respect to hydrology, tidal regime, wave climate, sediment transport and morphology. The key impacts are associated with the construction of this infrastructure including underwater noise from piling (assessed in Chapter 5) and terrestrial noise from piling (assessed in Chapter 7).

2.5.8 Temporary Grounding Pad

The construction works will incorporate the placement and removal of a temporary grounding pad which will be placed to facilitate berthing of vessels at the new quay wall, if required. The maximum areal extent of the ground pad will be 250m by 250m. The pad will be installed up to a level of -8mCD (i.e. it will be built up above the capital dredge level of -12mCD).

It is considered that given the limited area and the temporary nature of the grounding pad that there will not be associated significant impacts to hydrology, tidal regime, wave climate, sediment transport and morphology. The coastal modelling (detailed in Chapter 9) undertaken to assess the revised bed level of -12mCD is considered to represent a worst case scenario with respect to the potential for impact and as such the assessment is deemed suitable to consider impacts associated with the proposed reprofiling of existing seabed level for a temporary period.

The material proposed for the grounding pad construction will be formed of engineered granular fill with a low fines content and construction will incorporate direct placement of material onto the seabed. Subsequent removal will be undertaken using a backhoe dredger. On that basis the potential for impact associated with release of suspended solids from placement and removal of the temporary grounding pad is considered to be of a lower significance than that assessed by the maintenance dredge plume modelling undertaken in Chapter 9 (which is considered to represent a worst case assessment).

2.5.9 Site Utilities

Details of the proposed site utilities are summarised below and shown in Ach Henderson Drawing Nos HMY-AHN-00-00-DR-C-9105, HMY-AHN- 00-00-DR-C-9106, HMY-AHN- 00-00-DR-C-9107 and HMY-AHN- 00-00-DR-C-9108, Volume 2 of this EIAR:-

- 3m high ISPS security fencing will bound the site to the south, east and north;
- Lighting will comprise street type lighting circa 10m high at 45 m spacing with LED lights at a LUX level of 20 on the roadside. 30m high Holophane lighting masts on the new quay on the west of the site ;
- Potentially 6 CCTV columns will also be installed; and
- Electricity will be provided at three locations namely by the site entrance and on the southern part of the quay and will comprise of one 11kv substations within a purpose-built building. Two substations (transformer and switching room) will also be present adjacent to the quay within purpose built buildings (one at the southern end and one at the northern end of the quay).

2.5.10 Site Drainage and Water Management

During the construction phase temporary drainage and water management measures will be implemented to protect the water environment. These will be designed in line with best practice pollution prevention requirements and take account of the proposed construction techniques and regulatory requirements. These are discussed in Chapter 9 of this EIAR.

The proposed development does not include a dedicated surface drainage network to collect storm water run-off. Rather, the majority of the HCY site will be covered by hard core to allow for free percolation and free drainage from the eastern boundary towards the quay wall. The quay wall itself will incorporate outfalls to allow the discharge of storm water. The site levels on the eastern boundary will be between 8-9m AOD and will fall to 6.0m AOD at the quay wall.

Whilst permanent infrastructure design and installation is not being undertaken as part of this proposed development Chapter 9 will discuss regulatory requirements with respect to future drainage consideration. Future drainage will be designed to incorporate Sustainable Urban Drainage Systems (SUDS) designed in accordance with the CIRA SUDS Manual (C697). It is expected that the future design will therefore include attenuation chambers, oil interceptors and sampling chambers before discharging to sea via outfall(s).

2.5.11 General Site Improvements

General site improvement works include landscaping and footpath formation within the site boundary.

2.5.12 Construction Traffic

It is anticipated that there will be a short period of mobilisation when plant and equipment will be brought to site and remain there until no longer required. Due to the marine source of the infill material, it will be brought to site via sea for deposit in the existing dry dock. All other construction materials (including piles, sheet piles) associated with these proposed works will be brought to site and unloaded at Hunterston deep water jetty or imported to site via road from other areas.

2.5.13 Overall Construction Timescales and Working Hours

It is anticipated that construction works will take up to two years to complete.

During this period, demolition, piling and earthworks to place and compact materials to create the quay and infill the dock is estimated to last one year. The land-based piling which will incorporate piling in areas of the site to facilitate elements required for the subsequent operation of the site including piling to create a stable foundation in the area of the infilled dry dock is estimated to be completed within approximately 1 year. Construction programme is currently estimated based on similar schemes undertaken in recent years. Programme also assume no restrictions on vessels, plant, manpower or equipment availability.

The normal working hours for construction are expected to be Monday – Saturday 7am to 7pm and Sunday 7am until 2pm. Dredging would be 24 hours, 7 days a week.

2.5.14 Environmental Management During Construction

Only experienced marine contractors will be invited to tender for the Works. The successful tenderer will be required to submit:

- A Construction Environmental Management Plan (CEMP);

- Risk Assessments and Method Statements (RAMS) for all major aspects of the Works; and
- A Site Waste Management Plan (SWMP).

The above documents will be submitted for approval by the Statutory Authorities prior to any Works commencing on site.

The Contractors CEMP will take into account the information provided in the CEM Document (Refer to Section 14.3 of this document).

Implementation of the CEMP and other environmental control procedures will be checked by an independent environmental clerk of works, through site visits, inspections and audit of the Contractors records throughout the duration of the Works.

2.6 Operational Phase

The proposed development's operational phase relates principally to its post-construction existence as an upgraded port facility with very limited site activity because, as identified in Section 1.4, the nature of future activity at HCY is unknown at the time of preparing the EIAR and, therefore, is not covered by the EIAR. The following section details the elements considered within the EIAR with respect to the operational phase.

2.6.1 Physical Presence of Development

The proposed development's operational phase will include its physical presence within the marine environment (e.g., the quay wall, dredged seabed, mooring dolphins and grounding pad) and its physical presence within the terrestrial environment (e.g., the quay wall area, working platform area, perimeter fencing, perimeter lighting and CCTV, substations).

2.6.2 Expected Site Activities

For the operational phase assessment, expected site activities are related to the site continuing in use as an operational port facility. Any subsequent use that introduces operational elements that add additional activities that differ from those detailed in the following sections will be subject to their own assessment and related relevant planning, consenting and permitting requirements.

2.6.3 Dredging

During the operational phase maintenance dredging will be a requirement to ensure that vessels can safely access the site. The need for and frequency of maintenance dredging campaigns will depend on the future rate of sediment accretion and the draught of vessels using HCY. Clydeport, as the statutory harbour body, will undertake routine bathymetric surveys to monitor seabed levels and determine the need for maintenance dredging. Maintenance dredging campaigns for HCY are likely to be coordinated with campaigns undertaken at Clydeport's other locations; hence, maintenance dredging at HCY is expected to be conducted using a Trailing Suction Hopper Dredger and the resulting dredged material is expected to be disposed of offshore. The maintenance dredge campaign is assumed to be carried over a period of 7 days.

2.6.4 Vessel Movements and Navigation

The Navigational Risk Assessment (Technical Appendix 12.1) documents the predicted operational traffic movements and predicted navigational risks associated with the new quay.

This assessment informs the Accidents and Natural Disasters Chapter relating the implications for the ongoing port operations at the site.

The control of marine invasive non-native species related to the operation of the site will be informed by the Firth of Clyde Biosecurity Plan and Peel Ports guidance as detailed in Chapter 5.

2.6.5 Drainage

The proposed works incorporate installation of drainage outfalls within the new quay wall however permanent drainage infrastructure across the site will not be installed during this proposed development.

On completion of the construction phase the majority of site will allow for free percolation and free drainage, outfalls will be installed in the new quay wall which will drain the quayside area only. Drainage outfall discharges will be regulated under the SEPA Controlled Activity Regulations. Future drainage which will connect into these outfalls will be designed to incorporate Sustainable Urban Drainage Systems (SUDS) designed in accordance with the CIRIA (Construction Industry Research and Information Association) SUDS Manual (C697 and will be regulated under SEPA's Controlled Activity Regulations It is expected that the future design will therefore include attenuation chambers, oil interceptors and sampling chambers before discharging to sea via outfall(s). This will be assessed as part of any future development works proposed for the site.

2.7 Decommissioning Phase

For a development of this type, decommissioning is not envisaged. Should decommissioning ever be planned in the future Statutory Regulators would be consulted and applications made at that time under whatever future regulatory regime exists at that point in the future.

3 PLANNING CONTEXT

3.1 Introduction

The proposed development to upgrade HCY includes works that will extend over the jurisdictional boundaries for development control by North Ayrshire Council (NAC) under the Planning (Scotland) Act 2019 and marine licensing by the Scottish Government's Marine Directorate under the Marine (Scotland) Act 2010). In essence, the marine licensing regime extends landwards up to the MHWS level, and the planning authority's development control extends seawards down to the MLWS level.

The relationship between the statutory land use planning system and marine planning and licensing, is set out in Scottish Government Circular 2015/1 .

The planning policy profile crosses over between the adopted local development plan policies including NPF4 (which incorporates updated Scottish Planning Policy, and contains detailed national policy on several planning topics) and the strategic policies set out by the Scottish Ministers in the National Marine Plan. The latter document sets out general planning principles created by the Scottish Ministers, some of which will apply to the proposed marine works.

The proposed development is in line with the strategic planning as per the Local Development Plan adopted by NAC and more recently National Planning Framework 4 (NPF4).

3.2 Land Use Planning Policy

3.2.1 National Planning Framework 4 (NPF4)

The Planning Acts require that planning applications are determined in accordance with the Development Plan, taking into account all other material considerations. In respect of the current proposals, the Development Plan comprises the North Ayrshire Council Local Development Plan 2 (LDP), adopted on the 28th November 2019, and the recently adopted National Planning Framework 4 (adopted by the Scottish Government in February 2023).

NPF4 sets out six overarching principles to support the Scottish Government's planning of future places. In applying these principles, the national spatial strategy, as set out in NPF4, will support the planning and delivery of:

- Sustainable places, where we reduce emissions, restore and better connect biodiversity;
- liveable places, where we can all live better, healthier lives; and
- productive places, where we have a greener, fairer and more inclusive wellbeing economy.

The above spatial strategy goes on to define eighteen national developments within NPF4, including Hunterston Strategic Asset which:

supports re-use (of) the port and wider site, engaging in new technologies and creating opportunities from nuclear decommissioning to make best use of existing infrastructure and provide local benefits.

NPF4 defines the Hunterston Strategic Asset national development as comprising Hunterston Port, the former nuclear power station sites and marketable employment land at Hunterston Estate.

With regards to the narrative around the National development status of Hunterston Strategic Asset, NPF4 states:

This national development supports the repurposing of Hunterston Port as well as the adjacent former nuclear power station sites and marketable business land of the Hunterston Estate. Hunterston has long been recognised as a strategic location for the port and energy sectors given its deepwater access and existing infrastructure. Hunterston is a key site, anchoring other opportunities around the Firth of Clyde.

The location and infrastructure offers potential for electricity generation from renewables, and a variety of commercial uses including port, research and development, aquaculture, the circular economy, and environmental and economic opportunities around nuclear decommissioning expertise.

As a point of principle, the proposed development is defined as having National Development status under NPF4 due to the inclusion of Hunterston Strategic Asset within NPF4. The proposed works within the current planning application therefore benefit from the support within NPF4 and accord with the requirements of NPF4.

The proposed development will also be assessed against other NPF4 Policies, more importantly Policy 3 in relation to Biodiversity, Policy 9 Brownfield, Vacant and Derelict Land and Empty Buildings, Policy 10 Coastal Development and Policy 26 Business and Industry. The supporting Planning Statement considers these policies in more detail and finds that the proposed development is in accordance with NPF4.

3.2.2 Local Development Plan

The adopted Local Development Plan Strategic Policy 3 includes the Hunterston site as one of a number of Strategic Development Areas.

Under Strategic Policy 3, the Council states that:

We recognise the strategic national importance of Hunterston as an energy hub and deep water port. We strongly support the inclusion of Hunterston in the National Planning Framework 4. In particular we will support the following uses in relation to the Hunterston Deep Water Port:

- Renewables generation, manufacture, maintenance, research and development, testing and training (including support for a renewables skills academy),
- Strategic grid connections recognising its importance as a landfall to support the offshore renewable energy sector,
- Maritime construction and decommissioning (including oil and gas structures),
- Bulk handling facilities for importing, processing and distributing all dry and bulk liquid cargoes,
- Local scale Bio-mass energy generation developments as per Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009, and
- Other storage, processing and distribution uses and general light industrial activities where they would not undermine the strategic importance of, and unique assets of Hunterston as a deep water port.

LDP Policy 7 Business and Industry Employment Locations states that:

We will, in principle support and promote the development of the locations listed in Schedule 5 for business and industry uses. In these locations other employment generating uses may also be supported provided they would not undermine the marketability of the area for business and industry uses.

Hunterston is identified as a 277ha business and industry employment location within Schedule 5 of LDP. The proposed marine construction yard works, within this application, are consistent with this Policy.

LDP Policy 24 Alignment with Marine Planning supports in principle developments with a marine component or implication, including specifically 'land based development associated with offshore energy projects' where they are within a recognised developed coastal location. The application site is confirmed as a developed coastline. It is a

Policy requirement that 'marine proposals should identify environmental impacts and mitigate against these to ensure there are not any unacceptable adverse impacts.'

There are a number of environmental and development management policies within LDP that the proposed planning application will need to address through its assessment of the development and its potential effects. These are set out in the supporting Planning Statement and discussed in more detail with reference to the degree that the development accords with policy.

The proposed development is clearly supported by specific policies within the adopted LDP and the proposals are consistent with the aims and vision set out in LDP. There is considerable synergy between the focus of LDP in relation to the importance of Hunterston as an economic asset and its status within NPF4.

3.3 Marine Planning

3.3.1 Clyde Marine Planning Partnership

With regards to Marine Planning, the Clyde Marine Planning Partnership (CMPP) was one of the first marine partnerships established with the objective of taking forward regional marine planning in the Clyde through a regional marine plan. The plan has not yet been developed; when it is, it will aim to balance environmental protection with economic growth on the Clyde. The local level regional marine plan must comply with Scotland's National Marine Plan. The Clyde Marine Planning Partnership would nevertheless be a consultee with regards to the proposed works.

3.3.2 National Marine Plan

The National Marine Plan was published in 2015 and lays down policies for sustainable development within the marine environment. The Plan specifically recognises the interface between marine and terrestrial planning and acknowledges that in most cases development within the marine environment will also have terrestrial planning implications.

The Plan lays out a core set of General Policies which apply across all developments and use of the marine environment. These General Policies are intended to represent the characteristics against which the sustainability of development and use is considered. The General Policies apply to all plan making and decision making in the marine environment. The policies provide a clear overarching framework for all activity. More detailed policies in the sector chapters of the Plan are subject to the General Policies.

3.3.3 General Policies

The following relevant General Policies will be taken into consideration in any decision-making process.

GEN 1 General planning principle: There is a presumption in favour of sustainable development and use of the marine environment when consistent with the policies and objectives of this Plan.

GEN 2 Economic benefit: Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.

GEN 3 Social benefit: Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan.

GEN 4 Co-existence: Proposals which enable coexistence with other development sectors and activities within the Scottish marine area are encouraged in planning and decision-making processes.

GEN 5 Climate change: Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change.

GEN 6 Historic environment: Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance.

GEN 8 Coastal process and flooding: Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding.

GEN 12 Water quality and resource: Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.

GEN 13 Noise: Development and use in the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects.

The proposed harbour upgrade does not conflict with the Marine Plan General Policies. Development that has sustainable economic (GEN 2) and social benefits (GEN 3) are encouraged in the Plan. The minimum benefit of the proposed development will be to provide a quay wall and working harbour footprint which will allow the Construction Yard to be able to support the offshore wind industry for activities potentially including gravity-based structure construction, jacket construction, turbine assembly, and associated activities including the storage of components. The development has both economic and social benefits through the support of economic activity and commitment to direct and indirect supply chain employment.

The marine works licence application is supported by this EIAR which addresses issues relating to the coastal processes (GEN 8), water quality and resource (GEN 12) and Noise (GEN13).

3.3.4 Marine Planning Policy

The Shipping, Ports, Harbours and Ferries sector of the Marine Plan sets out a number of objectives, none of which the proposed development is in conflict with. It also defines the following marine planning policies.

TRANSPORT 1: Navigational safety in relevant areas used by shipping now and in the future will be protected – the proposed development is located within the existing Hunterston Port. which historically has launched ships into the River Clyde. The proposed works may utilise existing maintenance dredging regimes to provide infill material to be deposited by barge. The transfer of material by barge will as a matter of course take account of navigational safety.

TRANSPORT 2: Marine development and use should not be permitted where it will restrict access to, or future expansion of, major commercial ports or existing or proposed ports and harbours – there is no conflict.

TRANSPORT 3: Ferry routes and maritime transport to island and remote mainland areas provide essential connections and should be safeguarded from inappropriate marine development and use that would significantly interfere with their operation – there is no conflict with ferry routes or maritime transport; navigational risk is fully addressed.

TRANSPORT 4: Maintenance, repair and sustainable development of port and harbour facilities in support of other sectors should be supported in marine planning and decision making – the proposed development supports and enhances the existing port activity and is consequently, in principle, supported by the Marine Plan.

TRANSPORT 5: Port and harbour operators should take into account future climate change and extreme water level projections – although not a port/harbour operation, the proposed works have been assessed with regards to the coastal processes modelling.

TRANSPORT 6: Marine planners and decision makers and developers should ensure displacement of shipping is avoided where possible – no displacement is expected.

In assessing the proposed development activity in the context of the National Marine Plan, there is not considered to be conflict with the objectives, General Policies or sector policies within the Plan. In principle the Plan supports sustainable development that has an economic and social benefit.

We would also note that the Plan states in para 2.16, that it should be applied proportionately, taking account of the potential scale of impact of any proposal as well as the sensitivity of the environment and/or any potential social or economic effect under consideration.

3.4 Conclusions

In conclusion, we find that the proposed development does not conflict with either terrestrial planning policies contained within LDP and NPF4 or marine planning policies as set out in the National Marine Plan.

4 EIA METHODOLOGY AND SCOPE

4.1 Introduction

The purpose of an EIA is to identify and evaluate the likely significant effects of a proposed development on the environment, both direct and indirect, and identify measures to mitigate or manage any significant adverse effects. The EIA process also provides an opportunity to 'design out' adverse effects wherever possible. Where adverse effects cannot be designed out, mitigation measures are proposed to avoid, compensate or reduce significant environmental effects to an acceptable level where possible. The findings of the EIA process must be documented in a clear and understandable manner within the EIAR. The EIAR is then submitted to assist the Regulators in determining any planning and / or marine licence applications required.

The EIAR submission includes a Non-Technical Summary (NTS). This is a concise, stand-alone document which provides a project description, the baseline environmental conditions along with the findings of the EIAR in an accessible and easy-to-read format. The NTS does not use technical terms, detailed data or scientific discussion.

The EIA work is undertaken by specialist environmental and technical consultants on the basis of project information supplied by the Applicant and their engineers and following consultation with statutory consultees, other bodies and members of the public.

EIA is an iterative process which allows feedback from stakeholder consultation and the results from baseline studies to be fed into the design process of the proposed development.

4.2 EIA Objectives

The objectives of the EIA are:

- To establish a robust environmental baseline upon which to base environmental assessment, incorporating field surveys, desk study and consultation;
- To provide an assessment of the potential environmental impacts of the proposed development and to determine which of these, if any, are likely to result in a significant effect on the receiving environment; and
- Where significant effects are predicted, to determine mitigation measures to reduce the residual effects to acceptable levels where possible and document residual effects.

4.3 Key Terms

To ensure clarity and consistency through the EIAR, the following key terms have been used:

- 'the proposed development' refers to the construction of the proposed development as described in Chapter 2: Proposed Development;
- 'the site' is the land bound by the red-line boundary and sea bound by the blue-line boundary in which the proposed development lies, and is illustrated within Arch Henderson Drawing No HMY-AHN-00-00-DR-C-001, Volume 2 of this EIAR; and
- The 'Study area' is the area over which desk based or field assessments have been undertaken and are identified within each chapter. The core study area varies depending on the nature of the potential effects within each discipline, as informed by professional guidance and best practice regarding EIA. All of the core study areas cover the site and are described within the methodology section of the relevant chapters within this EIAR.

4.4 Screening as Part of the EIA Process

In determining the requirement for an EIA, Schedule 1 of both EIA Regulations sets out the types of development for which EIA is a mandatory requirement, whilst Schedule 2 lists the projects where the need for EIA is judged on a case-by-case basis, depending on whether a proposal is likely to cause significant environmental effects or is located in a sensitive area as defined by the EIA Regulations.

As the proposed development contains elements which transcends the intertidal zone (i.e. the area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS), which constitutes the dividing line between terrestrial and marine planning, consents will be required from both NAC and MD-LOT. It is identified that the proposed development is a Schedule 1 development as it falls within the description of Paragraph 8 (2) of both the terrestrial and marine EIA regulations. The proposals fall under the description of a Paragraph 8 (2), Schedule 1 development of both the EIA and Marine EIA Regulations. The paragraph refers to:

"Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes".

Accordingly, an EIA is automatically required to support applications under both the Town and Country Planning (Scotland) Act and the Marine (Scotland) Act, and a formal screening request for the proposed development was not submitted.

4.5 Scoping as Part of the EIA Process

4.5.1 Introduction

The sections below set out the EIA Scoping process for this development and accordingly documents how the EIAR was shaped into what is currently included and offers rationale to why other topics have been excluded, based on the likelihood of likely potential significant effects.

4.5.2 Scoping Requests and Opinions

A request for a formal Scoping Opinion was submitted to NAC and MD-LOT on 6th October 2023 under Regulation 17(1) of the Town & Country Planning (EIA) (Scotland) Regulations 2017 and Regulation 14(1) of the Marine Works (EIA) (Scotland) Regulations 2017. This was accompanied by an EIA Scoping Report (Refer to Technical Appendix 3.1, Volume 3 of this EIAR) provided to assist the NAC, MD-LOT, statutory and non-statutory consultees to form an opinion upon the likelihood of potentially significant environmental effects and hence the topics to be assessed in the EIA (i.e. those topics where significant environmental effects could potentially result if unmitigated). The Scoping Report also provided an opportunity for consultees to comment upon suggested methodologies for technical assessment.

A Scoping Opinion was determined by NAC dated 1 December 2023 (Refer to Technical Appendix 3.2, Volume 3 of this EIAR). This contained formal responses from internal Council departments, Historic Environment Scotland (HES), Marine Scotland, Scottish Environment Protection Agency (SEPA), NatureScot and Scottish Water.

A Scoping Opinion was determined by MD-LOT dated 23 February 2024 (Refer to Technical Appendix 3.3, Volume 3 of this EIAR). This also contained formal responses from HES, Maritime and Coastguard Agency (M&CA), MOD - Defence Infrastructure Organisation, NatureScot, Northern Lighthouse Board, North Ayrshire Council, Office for Nuclear Regulation, Peel Ports, RSPB Scotland, RYA Scotland, SEPA, Scottish Fishermen's Federation, the Marine

Directorate – Marine Analytical Unit (MAU), Marine Invasive Species Team – Marine Directorate and Transport Scotland (TS).

4.5.3 Scoping Opinion – Defined Scope

The Scoping Responses from both NAC and MD-LOT are summarised in Table 4-1. This table provides a signpost of where these issues have been addressed, or where applicable, why they have been scoped out of the EIA.

Where the same issue has been raised by more than one consultation body, it has only been referred to once in order to avoid duplication. Further information is available within each technical chapter regarding where this information is held within that chapter.

Table 4-1: Summary of Scoping Responses

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
North Ayrshire Council	Air Quality	It is agreed that this can be scoped out. However, any planning application should include a Construction Dust Risk Assessment.	Chapter 13, Section 13.1 and Technical Appendix 13.1 and 13.2, Volume 3 of this EIAR	A Construction Dust Risk Assessment and Construction Dust Management Plan have been produced and are included as part of the Supporting Information to this EIAR.
	Biodiversity	The EIA Report should include an assessment of the potential effects on important ecological features and should detail proposed mitigation and/or compensation measures required to avoid, minimise, restore or offset adverse effects and demonstrate positive effects for biodiversity. NS advise that the nearest Special Protection Areas and Special Area of Conservation can be scoped out and appropriate assessments are not required. The impact on the Southannan Sands SSSI ("the SSSI") must be assessed. The impact on the Priority Marine Features of the SSSI and on a recently discovered mussel reef must be considered. The impact on the Kames Bay and Ballochmartin Bay SSSIs on Cumbrae must also be assessed. A copy of the full NS response is attached. A survey for otters should be carried out and considered in the EIA. The Marine /marine. An additional Wetland Bird Survey should be carried for the SSSI area. A Marine Mammal Protection Plan, Construction Environmental Management Plan and Outline Habitat Management Plan should be provided as per NS advice.	Chapter 5 and Chapter 14, Technical Appendix 5.1, 5.2 and 5.6, Volume 3 of the EIAR	These designated sites have been considered within the Biodiversity Chapter. Otter have been scoped into the assessment and site survey work incorporating a preliminary ecological assessment has included for assessing otter. General mitigation measures have been recommended; however a detailed Species Protection Plan will be completed upon further pre-construction surveys. A Marine Mammal Protection Plan, Construction Environmental Management Plan and Biodiversity Net Gain Feasibility Assessment (incorporating habitat management plans) have been produced in support of this EIAR.
	Carbon	A Carbon Impact Assessment should form part of any EIA Report. The methodology set out in Chapter 7 of the Scoping Report dated Sept 2023 is agreed.	Chapter 13, Section 13.3	Chapter 13, Section 13.3 details the Carbon Impact Assessment undertaken to support the EIAR.
	SLVIA	The proposed Seascape/Landscape Visual Impact Assessment is agreed. The context of the site in an industrial landscape is noted as are the permitted developments which would add to that landscape context. The cumulative impacts should be considered. Given the nature of the works, assessment of receptors in a 5km radius is agreed. In addition to the viewpoints in Table 8.1 of the Scoping Report dated Sept 2023, a viewpoint from Millport is requested. A viewpoint from somewhere such as outside No. 27 West Bay Road is requested. This would incorporate the likely most visible viewpoint from the Conservation Area and adjacent to a recreation ground at a distance of approx. 3km from the site.	Chapter 6	Section 6.5.6 of the SLVIA chapter details cumulative impacts. Section 6.5.5 details the viewpoints used including a viewpoint from Millport.
	Land Quality	Whilst this can be scoped out as a full chapter, any site investigation reports should be submitted as part of any planning application	N/A	A Phase I Desktop Geo-Environmental Report has been produced for provision with the planning application.

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
	Socio-Economic	It is agreed this can be scoped out of the EIA Report. However, any planning application should include information on the potential economic benefits from the construction works and potential scope for community wealth building.	Chapter 10	A Socio-Economic Chapter has been produced for the EIAR.
	Terrestrial Noise	There will likely be impact from construction noise. It is noted NAC Environmental Health will be consulted to agree a methodology for a noise impact assessment.	Chapter 7, Section 7.4	Methodology was agreed with the NAC Environmental Health and is detailed in the Chapter and supporting Noise Impact Assessment Report.
	Traffic and Transport	Any EIA should assess the transportation issues associated with the construction phase. The site has a lawful general industrial use. However, operational traffic would be a matter for future applications/assessments. As a first principle any assessment should consider use of the rail and port linkages, particularly in relation to any abnormal loads.	Chapter 8 and Chapter 12	A Traffic Assessment and Navigation Assessment have been undertaken as part of the EIAR
	Coastal Processes	The proposed chapter should be included in any EIA Report. Marine Scotland's advice on the location of aquaculture is attached.	Chapter 9	Chapter 9 details the Coastal Processes Assessment
NatureScot	Biodiversity	Designated Sites – The proposed development is likely to have a significant effect on qualifying interests of Southannan Sands.	Chapter 5	Designated sites have been considered within the Biodiversity Chapter. .
		Otter –We note that otter has not been recorded in the proposal area to date. As otters are a highly mobile species and could use the existing rock armour for shelter, we advise that otter are scoped into the EIA. If any impacts are identified, then mitigation measures should be outlined within a species protection plan	Chapter 5	Otter have been scoped into the assessment. General mitigation measures have been recommended
		A risk assessment approach to licensing for European protected species (EPS) will be required to manage direct disturbance and auditory injury impacts to protected marine species. We welcome the proposal to carry out underwater noise modelling to inform a risk assessment for marine mammals. The proposed method for this is only very briefly described, but in principle seems to be an appropriate approach. 3.8 Cumulative impact assessment will be required and should take into account any other activities which may also cause injury and/or disturbance to marine mammals, not just other piling activities.	Chapter 5 and Technical Appendix 5.4, Volume 3 of this EIAR	The Biodiversity Chapter includes assessment of impact to the EPS including consideration of Underwater Noise and Cumulative Impact. An Underwater Noise Impact Assessment and Marine Mammal Risk Assessment is provided in support of this EIAR.
		We advise that an updated assessment of the potential impacts of the two year development phase and subsequent operational phase, given the current low levels of activity at the marine yard, is required for birds present on and around the application area as the combined effect of construction and operation will result in a significant change in disturbance levels. To properly assess potential impacts, we advise that additional Wetland Bird Surveys (WeBS) are carried out, covering the entire coastline of the SSSI to provide current data with which to compare the historic records. This could be reviewed after one year if the information gathered provides the necessary level of detail.	Chapter 5	Chapter 5 incorporates details on bird survey work undertaken in 2023 and 2024 to inform an updated assessment.

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
	Invasive Non-Native Species (INNS)	Given this maritime movement we recommend that an assessment of management actions and/ or mitigation required to address issues relating to invasive species such as, but not limited to, wireweed *(Sargassum muticum*) and carpet sea squirt (*Didemnum vexillum*) are carried out. We advise that a site-based biosecurity plan for marine non-native species and terrestrial non-native species affecting seabirds should be developed in line with best practice Marine Biosecurity Planning guidance (SNH and Firth of Clyde Forum 2014)	Chapter 5 and Technical Appendix 5.5, Volume 3 of this EIAR	A site based bio-security plan has been produced for the site. This incorporates assessment of wireweed *(Sargassum muticum*), carpet sea squirt (*Didemnum vexillum*) and terrestrial non-native species affecting seabirds.
	Operational Impacts	Given the wide range of potential operational impacts, e.g. transmission of invasive species, impacts on wading and water birds and impacts to water environment and associated habitats we do not agree that operational impacts of the proposed development should be scoped out of the EIA. We believe there will be a significant change from the current baseline condition as a result of the activities proposed for this currently vacant site.	Chapter 5	Chapter 5 incorporates consideration of operational impacts.
	SLVIA	Landscape and visual impacts of the proposed development are a key consideration, including cumulative impacts with other developments in the Hunterston Strategic Development Area.	Chapter 6	Chapter 6 details the SLVIA undertaken in support of the EIAR.
	Mitigation, Enhancement and Best Practice in Environmental Management	We support the preparation and implementation of a Construction Environmental Management Plan (CEMP) and given the complexity and importance of the CEMP would welcome the opportunity to comment on a draft version of the CEMP as part of the EIA Report. We would also welcome the inclusion of an Outline Habitat Management Plan (OHMP) in the proposed EIAR. We recommend the OHMP addresses both compensation and enhancement work, in line with NPF4 Policy 3(b)13 to provide for positive effects for biodiversity. Our guidance on what it include in a HMP14 can be accessed from our website	Chapter 5, Chapter 13.3 and Technical Appendices 5.10 and 14.1, Volume 3 of this EIAR	A CEMP is provided as Technical Appendix 14.1. Chapter 5 and supporting Technical Appendix 5.10 details the Biodiversity Enhancement and Management Plan
Historic Environment Scotland	General overview	It is noted in the Scoping Report that all of the works proposed are to take place in areas already likely to have been extensively disturbed by historic dredging, land reclamation and the construction of the existing construction yard and dry dock. No significant impacts on marine archaeology are therefore predicted by the applicant's archaeological advisors. Given that the proposal is located on reclaimed land with a history of industrial usage, more recently a wind turbine test site, significant impacts on assets within our remit are unlikely. Our historic environment interests can therefore be scoped out of EIA.	N/A	Scoped out of the EIAR.
Marine Invasive Species Team	mINNS	We would include *Didemnum vexillum* as a marine invasive non-native species of concern at the site, as it is a high impact species which we know to be present in nearby Fairlie, and also *Styela clava*.	Technical Appendix 5.5, Volume 3 of this EIAR	*Didemnum vexillum* and *Styela clava* have been included in the Biosecurity Plan.
Maritime and Coastguard Agency	Traffic, shipping and navigation	We note that shipping has been identified as a potential receptor that is sensitive to the potential impact of traffic increase and that construction materials will also be transported to the site by sea. However, the impacts associated with shipping are	Chapter 12 Technical Appendix 12.1, Volume 3 of this EIAR.	A Navigational Impact Assessment is detailed in Chapter 12. A Navigational Risk Assessment is provided in Technical Appendix 12.1.

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
		scoped out of further assessment. The M&CA would expect the impact on commercial and recreational navigation to be considered as this project progresses.		
	Navigation Risk Assessment (NRA)	To ensure local stakeholder input, the M&CA would recommend a hazard identification workshop be held, to bring together relevant navigational stakeholders for the area to discuss the potential impacts on navigational safety during the construction and operational phase. Decisions relating to further controls should be agreed in consultation with other interested parties to determine whether the ALARP status has been met for each risk. The outputs of the NRA should be used to inform a judgement on significance of effects arising from the Project.	Technical Appendix 12.1, Volume 3 of this EIAR.	A HAZID and Risk Analysis workshop with the stakeholders was held on 11 April 2024 and is detailed in Section 5 of Technical Appendix 12.1
MOD	General overview	The MOD has no objections regarding this activity.	N/A	
Northern Lighthouse Board	General overview	Northern Lighthouse Board are content with the proposed EIA scoping report.	N/A	
Office for Nuclear Regulation	General overview	The applicant should take due cognizance of the HNA and HNB nuclear licensed sites, operated by Magnox Ltd and EDF Energy Nuclear Generation Ltd respectively. The applicant should liaise with the emergency planning function in South Ayrshire Council in relation to the whether the proposed development can be accommodated in the Off-Site Emergency Plan for HNB; and The applicant should liaise with Magnox Ltd and EDF Energy Nuclear Generation Ltd in relation to the potential external hazards the proposed development poses to HNA and HNB respectively (and vice versa).	Chapter 11, Section 11.5.4	An Accidents and Natural Disasters Chapter has been produced for the EIAR. Meetings have been held with Magnox Ltd and EDF Energy Nuclear Generation with details provided in Section 11.5.4. Contact was made with emergency planning function of North Ayrshire Council however at the time of writing no response has been received.
RSPB Scotland	Biodiversity	Policy 3 of NPF4 sets out a requirement for developments to deliver biodiversity enhancement. This must be in addition to any mitigation and off-setting which is required to achieve 'no-net-loss'. We believe that enhancements should focus on local priority habitats and species, ensuring they are in a demonstrably better state than before the development. Part b)iv of the policy states that large EIA developments such as this, must demonstrate how they have met a number of criteria including: significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty.	Chapter 5 and Technical Appendix 5.10, Volume 3 of this EIAR	Chapter 5 and supporting Technical Appendix 5.10 details the Biodiversity Enhancement and Management Plan
RYA	General overview	RYA Scotland and broadly agree that recreational boating can be scoped out of the EIA. However, the report provides no evidence to support this. The 730 berth Largs Marina is only 4 km away from the development and Fairlie Quay with its moorings is even nearer. This is in one of the busiest areas in Scotland for recreational boating and it was surprising not to see this mentioned. It was also surprising to see that it is proposed to scope out shipping and navigation in advance of undertaking a Navigational Risk Assessment. Peel Ports Clydeport works well with recreational users of these waters and publish, for example, the Clyde Leisure Navigation Guide,	Chapter 12, Technical Appendix 12.1, Volume 3 of this EIAR	A Navigational Risk Appendix has been produced and is a Technical Appendix 12.1 that provides context on the risk to commercial and recreational navigation in support of this section of the EIAR. To facilitate this NRA a Hazard Identification (HAZID) workshop was held in Hunterston and was attended by representatives of the harbour

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
		now in its fifth edition. The existing NRA should have been reviewed to see if the development poses any new hazards, which seems unlikely".		authority, the local council, nearby marinas and a member of RYA Scotland. The risk outcomes, causes and controls, cited in the NRA were drawn from the stakeholders who attended the HAZID workshop. Particular care was made to ensure that the Clyde Leisure Navigation Guide was cited as a control in the HAZID, along with other measures to support recreational vessel operators such as education, regular engagement, and familiarisation.
Transport Scotland	Environmental Impacts	Transport Scotland would wish to draw attention to the new guidance that has been published by the Institute of Environmental Management and Assessment (IEMA). These Guidelines, entitled Environmental Assessment of Traffic and Movement (July 2023), are intended to update and replace the previous 1993 IEMA guidelines and provide enhanced and up to date advice on the assessment of traffic and movement. Transport Scotland would request that the thresholds as indicated within these new Guidelines be used as a screening process for the assessment.	Chapter 8	Chapter 8 incorporates the detail on the Traffic Assessment undertaken for the EIAR.
	Abnormal Loads Assessment	A full Abnormal Loads Assessment report should be provided that identifies key pinch points on the trunk road network if abnormal loads are envisaged.	Chapter 8	At this stage Abnormal Indivisible Loads (AILs) are not envisaged for this project, however, if it is determined necessary at a later date, an assessment of the proposed movement of vehicles with heavy, wide, long or/or high abnormal indivisible loads will be undertaken to determine the suitability of structures and roads (both trunk and non-trunk roads) to accommodate such vehicles. Movement of abnormal indivisible loads and abnormal vehicles will be undertaken in accordance with: (I) The Road Vehicles (Construction and Use) Regulations 1986 (SI 1986 No 1078), (ii) The Road Vehicles (Authorised Weight) Regulations 1998 (SI 1998 No 3111), (iii) The Road Vehicles (Authorisation of Special Types) General Order 2003 (SI 2003 No 1998), and (iv) Section 44 of the Road Traffic Act 1988
Marine Directorate	Description of the Proposed Works	There is a lack of detail provided in respect of the design of the Proposed Works and the methodology.	Chapter 2. Section 2.5.4	An updated Project Description has been provided with the EIAR. Infilling of the dry dock is detailed in Section 2.5.4.

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
		The methodology for the dry dock works is not clear. As such the Scottish Ministers cannot determine if the dry dock works will require a marine licence or if they will be within North Ayrshire Council's jurisdiction. Applicant must consider the worst-case scenario should the dredge material be considered unsuitable for use whereby all of the dredged material requires to be deposited at sea.		To confirm the proposed works methodology incorporates infilling of the dry dock as one of the initial elements of the proposed development, this will therefore be carried out whilst the existing entrance bund to the dry dock at the site remains in place, therefore the dry dock will be above MHWS during the infill. Consultation with Marine Directorate and SEPA has confirmed that this activity is therefore terrestrial and the infilling operation would require SEPA Waste Management Licensing should waste be used for this activity.
		We advise that the results of sediment sampling should be incorporated within the EIA Report and that the impacts of material assets and waste be scoped into the EIA Report.	Technical Appendix 9.2, Volume 3 of this EIAR and Chapter 13, Section 13.2	A BPEO has been provided in Technical Appendix 9.2. Material Assets and Waste is Detailed in Chapter 13.2.
		The EIA report should include the post-construction and operational phases of the Proposed works, as well as the construction phase.		For the operational phase assessment, expected site activities are related to the site continuing in use as an operational port facility and has been assessed in relevant Chapters of the EIAR.
	Design Envelope	A worst case scenario must be applied to the design, with every attempt to narrow the range of options. The Scottish Ministers will determine the applications based on the worst-case scenario and a CMS may be required.	Section 2	Section 2 details the project description. The EIAR has considered the worst case design option (incorporating a 570m quay wall and associated dredge). The application itself is for a 450m quay wall and associated dredge. As such the EIAR is considered to represent a conservative assessment of the proposed developments potential impacts.
	Accidents and natural disasters	Scottish Ministers do not consider that the Applicant has provided sufficient evidence to justify scoping out the risk of accidents and natural disasters. Accidents and natural disasters must be scoped in for further assessment in the EIA Report for construction and operational phases. Existing sources of risk assessment or other relevant studies should be used to establish the baseline rather than collecting survey data	Chapter 11	An Accidents and Natural Disasters Chapter has been included within the EIAR.
	Human health and population	It is recommended that human health and population impacts are scoped into the final EIA for both construction and operational phases.	Chapter 10	A Socioeconomic and Human Health Chapter has been included within the EIAR.

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
	Socio-economic impacts (SEIA)	It is recommended that SEIA are scoped into the final EIA and are to include Gross Value Added (GVA), employment impacts and engagement of local communities. .	Chapter 10	For the operational phase assessment, expected site activities are related to the site continuing in use as an operational port facility.
	SSSI	Cumulative impacts on the recently discovered mussel reef, supporting a native oyster bed and the other Priority Marine Features ("PMF") must be assessed for the Southannan SSSI. A lack of detail in the scoping report makes it difficult to identify what potential impacts on the intertidal interests of Kames Bay SSSI and Ballochmartin Bay SSSI.	Chapter 5	Chapter 5 details an assessment on the mussel reef locations in Southannan SSSI. Chapter 5 incorporates a discussion on the potential impacts to Kames Bay and Ballochmartin Bay.
	Marine & Freshwater Aquatic Habitats	The proposed MMPP should include more recent data to fully inform the assessment. Mitigation measures put in place should be applied to all species. A cumulative impact assessment must be undertaken and should take into account any activities which may also cause injury and/or disturbance to marine mammals in addition to piling activities	Chapter 5 and Technical Appendix 5.4 and 5.6, Volume 3 of this EIAR	An underwater noise impact assessment has been produced (Technical Appendix 5.4) in support of the EIAR. A Marine Mammal Risk Assessment has been produced and is provided as Technical Appendix 5.6.
	Benthic Habitats and Species	Clarity is needed on the volume of dredge material predicted to be removed and estimate timings for dredge operations. The dredge plume dispersal associated with the construction of the quay and subsequent maintenance dredging needs included in the coastal modelling study. In addition to the review of existing data, surveys will be required both in the footprint of Proposed Works site and in the zone of influence of site.	Chapter 5, Chapter 9 and Technical Appendix 5.3, Volume 3 of this EIAR	The proposed dredge volume which has been assessed in the EIAR is 1,546,660m^3. The actual application is based on a smaller dredge pocket and volume of 1,162,035m^3. On this basis the EIAR is considered to represent a worst case scenario. Chapter 9 details the Coastal Modelling including assessment of maintenance dredging. An updated intertidal survey is provided in Technical Appendix 5.3. An updated subtidal survey will be provided as a Technical Addendum to the EIAR.
	mINNS	mINNS should be scoped in for further assessment in the EIA Report for both the construction and operational phases of the Proposed Works. A site-based biosecurity plan should be developed in line with best practice Marine Biosecurity Planning guidance and the Firth of Clyde Biosecurity Plan.	Chapter 5 and Technical Appendix 5.5, Volume 3 of this EIAR	A biosecurity plan has been developed for the site and is provided as Technical Appendix 5.5.
	Marine & Freshwater Aquatic Habitats Summary	Marine and freshwater aquatic habitats receptors during both construction and operational phases of the Proposed Works should be scoped in for further assessment.	Chapter 5	Chapter 5 details the impact assessment to marine and freshwater aquatic habitats.
	Ornithology	The data used to determine bird use of the general area is considered outdated. Additional Wetland Bird Surveys must be carried out, covering the entire coastline of the Southannan Sands SSSI to provide current data.	Chapter 5 and Technical Appendix 5.7, Volume 3 of this EIAR	Further bird surveys have been carried out in 2023 and 2024. Chapter 5 details the findings of the assessment. Technical Appendix 5.7 details the bird survey work undertaken.

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
		An updated assessment of the potential impacts of the two year development phase and subsequent operational phase is required to assess disturbance levels on birds within and around the site.		
	Carbon, Climate Change & Greenhouse Gases	The EIA Report must include a GHG Assessment which should be based on a Life Cycle Assessment ("LCA"). This should include the pre-construction, construction, operation and decommissioning phases, including consideration of the supply chain as well as benefits beyond the life cycle of the Proposed Works.	Chapter 13, Section 13.3	For the operational phase assessment, expected site activities are related to the site continuing in use as an operational port facility. On this basis the only significant carbon impacts associated with the proposed development are all related to the construction phase of the works. It was therefore deemed more appropriate to follow PAS 2080:2023 methodology in carbon management in built and infrastructure sector.
	Seascape, Landscape and Visual	The addition of a viewpoint from Millport should be included in the assessment. The cumulative impacts should also be considered.	Chapter 6	Section 6.5.6 of the SLVIA chapter details cumulative impacts. Section 6.5.5 details the viewpoints used including a viewpoint from Millport.
	Traffic, Shipping and Navigation	All transport concerns must be addressed to the satisfaction of the consultees in the EIA Report. The impact on both recreational and commercial navigation should be considered. Impacts on traffic, shipping and navigation are scoped in for further assessment in the EIA Report.	Chapter 8 and Chapter 12	A Traffic Assessment and Navigation Assessment have been undertaken as part of the EIAR
	Water Environment and Coastal Processes	The Applicant must assess the magnitude of hydro-sedimentary effects of the proposed works. The Applicant must assess the magnitude of any likely changes in sandflat extent and extent of sub-habitats due to changes to the tidal currents, waves and sediment transport in combination. The Applicant must assess the potential effects of side-slope relaxation on the Southannan Sands SSSI sandflat feature as a separate operational-phase effect - this could require a full geotechnical assessment. The water environment and coastal processes should be scoped in for further assessment in the EIA Report for both construction and operational phases.	Chapter 9 Chapter 9, Technical Appendix 9.3, Volume 3 of this EIAR	Chapter 9 details the coastal modelling assessment including consideration of hydro-sedimentary effects and impacts from changes to tidal currents, waves and sediment transport. This assessment considers both construction and operational phases. As part of ongoing design since scoping the areal extent of the dredge pocket has been reduced and is now further away from the SSSI boundary than present at the scoping stage. On the basis of the reduction in the dredge area, the shallower slopes to the edge of the dredge pocket and the distance from the SSSI boundary it is considered that any side slope

Consultee	Topic	Point for Inclusion	EIA Report Chapter	Justification
				relaxation will have limited areal impact and as such it is very unlikely that slumping would subsequently result in impact to the SSSI edge. Consultation was undertaken with NatureScot to confirm that this was considered an appropriate resolution to the query. This consultation is detailed in Technical Appendix 9.3.
	Material Assets and Waste	If any deposit of dredged material at sea is proposed, a full justification for this must be provided.	Chapter 13, Section 13.2 and Technical Appendix 9.2, Volume 3 of this EIAR	Chapter 13, Section 13.2 details the Materials and Waste Assessment for the EIAR. This is informed by a BPEO provided as Technical Appendix 9.2

4.5.4 Further Consultation

For each individual technical assessment further consultation was undertaken as required and is detailed within the corresponding chapter.

4.6 EIAR Content

Schedule 4 of both EIA Regulations requires that the following information is provided:

- A description of the location of the development, its physical characteristics and land-use requirements during construction and operation;
- A description of the main characteristics of the operational phase of the proposed development;
- An estimate of residues and emissions produced during the construction and operation phases;
- A description of reasonable alternatives, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;
- A description of the relevant aspects of the current state of the environment and an outline of the likely evolution thereof without implementation of the development as far as reasonable;
- A description of environmental receptors likely to be significantly affected by the proposed development;
- A description of the likely significant effects of the development on the environment;
- A description of the forecasting methods or evidence used to identify and assess the significant effects;
- A description of the measures envisaged to mitigate significant effects;
- A description of expected significant adverse effects deriving from the vulnerability of the proposed development to risks of major accidents and/or disaster; and
- A non-technical summary of the aforementioned information.

4.7 EIA Key Stages

Whilst each environmental topic discussed within the EIAR establishes its own methodology based upon good practice and relevant industry guidance, there is a basic methodological framework which is applied to all EIA technical chapters.

The EIA process involves the following key stages:

- Baseline Studies – identification of existing environmental conditions through review of existing information, monitoring and field studies as required, to provide a baseline against which to assess the likely impacts of the proposed development;
- Potential Significant Impacts – identification of potential impacts and their resulting effects during the construction phases, in relation to the design mitigation already implemented and where applicable, taking alternatives into account;
- Impact Assessment – evaluation of the effects, resulting from the identified potential impacts, to determine their significance, both positively and negatively, and incorporating cumulative effects;
- Mitigation and Monitoring – the identification of measures to avoid, reduce or compensate likely significant effects and any steps required to monitor these potential environmental effects; and
- Residual Effects – identification of residual effects assuming successful implementation of mitigation.

For consistency where possible, the above headings have been used within the technical chapters of this EIAR.

4.8 Risk Assessment Approach

4.8.1 Introduction

The risk assessment approach uses the source – pathway – receptor linkages to assess the significance of the impact(s). The significance of an impact is defined by the probability of the impact occurring and its likely consequences (i.e. the Magnitude of Impact / Change). When a significant impact is identified then appropriate mitigation measures are identified to avoid or reduce that impact if possible and the residual risk following implementation of the mitigation measures is then considered. The risk assessment approach includes consideration of cumulative impacts with other developments.

Further information on the risk assessment approach is provided in the sections below.

4.8.2 Sensitivity/Importance of Receptors

The sensitivity of the baseline conditions/receptors is defined according to the relative importance of existing environmental features on or in the vicinity of the site, or by the sensitivity of receptors which would potentially be affected by the proposed development.

Criteria for the determination of sensitivity (e.g. high, medium or low) or of importance (e.g. international, national, regional or authority area) were established for each topic assessment based on prescribed guidance, legislation, statutory designation and/or professional judgement relevant to that topic.

4.8.3 Magnitude of Impact/Change

The methods for predicting the nature and magnitude of potential impacts vary according to the subject area. Quantitative methods of assessment can predict values that can be compared against published thresholds and indicative criteria in Government guidance and standards. However, it is not always possible to ascribe values to environmental assessments and therefore qualitative assessments are sometimes used. Such assessments rely on previous experience and professional judgement. The methodologies used for assessing each topic area are described within the specialist chapters of this EIAR and supporting assessments.

In general terms, the magnitude of impact on environmental baseline conditions is identified through detailed consideration of the proposed development, taking due cognisance of any legislative or policy standards or guidelines, and/or the following factors:

- The degree to which the environment is affected, e.g. whether the quality is enhanced or impaired;
- The scale or degree of change from the existing situation;
- Whether the impact is temporary or permanent, indirect or direct, short-term, medium-term or long-term; and
- Any in-combination effects and potential cumulative effects.

In some cases, the likelihood of impact occurrence may also be relevant and, where this is a determining feature of the assessment, this is clearly stated.

4.8.4 Significance of Effect

Significant effects are predicted where important resources, or numerous sensitive receptors, could be subject to impacts of considerable magnitude. Effects are unlikely to be significant where low value or non-sensitive resources are subject to minor effects.

The criteria for determining the significance of an effect have been developed giving due regard to the following, where applicable;

- Sensitivity, importance or value of the resource or receptor;
- Extent and magnitude and duration of the impact; and
- Performance against environmental quality standards.

The criteria and assessment methodology used for each topic considered within this EIAR are set out within the 'Methodology' section of the respective EIAR technical chapter.

Unless otherwise stated, reported effects are considered to be adverse. It is however possible that some effects may be positive and these are stated and explained where appropriate.

The EIAR reports on the significance of the environmental effects as per the EIA Regulations. Although a significant effect does not always have to equate to an unacceptable effect, in order to ensure impartiality, the EIAR does not comment on acceptability.

4.8.5 Design Mitigation and Residual Effects

Design mitigation is integral to providing an environmentally robust development whereby suggestions for mitigation are incorporated into the project prior to the 'design freeze'. This in-built mitigation represents, where applicable, environmental good practice and places a responsibility upon the Applicant to provide environmentally sustainable design solutions.

Residual effects of the proposed development are those that remain, assuming successful implementation of the identified mitigation measures. All remaining effects of the proposed development, following the application of mitigation measures, are summarised clearly and their significance stated, within the 'Residual Effects' section of each specialist chapter.

Where applicable, the EIAR also reports on opportunities for enhancement which could be incorporated into planning permission or marine licence conditions.

4.8.6 Cumulative Impact Assessment

Consideration of cumulative effects is a requirement of the EIA Regulations. By definition, these are effects that result from the cumulation of effects of the proposed development with other existing and/or approved development or works. There are different types of cumulative effects (such as in-combination and sequential effects), and typically cumulative impact assessment is assessed within each technical chapter.

4.8.7 Supporting Documents

The following documents have also been prepared to accompany the planning and marine license applications, which do not form part of the EIAR but are nevertheless associated with it.

- **Planning Statement** – this document assesses the level of compliance of the landward elements of the proposed development, drawing upon the evidence contained within the EIAR, in relation to the Development Plan and other material considerations.
- **Pre-Application Consultation (PAC) Report** – this provides information on the community engagement which has been undertaken prior to this submission with regards to the proposed development, and details public engagement initiatives and attitudes towards the proposed development. It covers both terrestrial and marine based PAC requirements; and
- **Marine Construction and Dredging and Disposal License Applications** –The dredging application is accompanied by a Best Practicable Environmental Option (BPEO) appraisal.

A Non-Technical Summary (NTS) has also been prepared.

4.9 Projects for Cumulative Assessment

A review of NAC's and Marine Directorate's public register was undertaken on 5th May 2024 to identify the other existing and/or approved development that could have cumulative effects with the proposed development. The projects identified which could have cumulative impacts with this development are identified in Table 4-2. These projects will be considered within each individual Chapter where relevant.

Table 4-2: Cumulative Schemes for Consideration in the EIAR

Planning/Application Ref	Address	Description of Development	Status
N/23/00606/PP	Hunterston Construction Yard, Fairlie, North Ayrshire	Site preparation works, establishment of compound area and initial groundworks including landscaping and other required infrastructure for Bakkafrost facility.	Planning permission granted
N/22/00979/PP	Hunterston Construction Yard, Fairlie, Largs, Ayrshire	Temporary consent for the establishment of a Fastrig Wind Sail Test Facility Yard to include all temporary buildings (including workshop, storage, office, canteen and WC), access, parking and other required infrastructure	Planning permission granted
N/23/00744/PP	Former Coal Terminal Hunterston, West Kilbride, Ayrshire	Development and operation of a grid stability facility	Planning permission granted
N/22/00133/PPPM & N/22/00712/MSCM	Former Coal Terminal Hunterston, West Kilbride, Ayrshire	The erection of a high voltage cable manufacturing facility (XLCC), including detailed planning permission for the construction of a 185m high tower with associated factories, research and testing laboratories, offices with associated stores, transport, access, parking and landscaping with on-site generation and electrical infrastructure and cable delivery system	Planning permission in principle granted and approval of reserved matters
0010510	Largs Lifeboat Slipway	Construction of new slipway	Marine Construction Licence Approved

Planning/Application Ref	Address	Description of Development	Status
SC0060	Cumbrae Ferry Slipway	Screening for construction of a new ferry slipway	Screening for Marine Licence
00010300	Fairlie	Construction of a new coastal path	Marine Construction Licence Approved

It is noted that the projects identified from the Marine Directorate's public register are of a small scale and are not in close proximity to the site, as such there is not considered to be significant potential for cumulative impact associated with these projects. During the review process it was identified that the construction works associated with the Millport offshore coastal defence works were completed in May 2024 and therefore there are no potential cumulative impacts associated with this development.

5 BIODIVERSITY

5.1 Introduction

EnviroCentre Ltd was commissioned by the Applicant to undertake an Environmental Impact Assessment (EIA) of the proposed development, in order to identify and describe any likely significant effects arising from it. This chapter details the specialist ecological studies undertaken and the results of the assessment. The assessment has been carried out according to the latest guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM)[2] by experienced and competent ecologists who are all Members of CIEEM and follow its Code of Professional Conduct. It is supplemented by the figures contained within Volume 2: Figures and the technical reports contained within Volume 3: Technical Appendices of this EIAR, including the following:

- Technical Appendix 5.1 – Hunterston Construction Yard Preliminary Ecological Appraisal
- Technical Appendix 5.2 – Hunterston Construction Yard Marine Mammals and Fish Baseline Assessment
- Technical Appendix 5.3 – Southannan Sands SSSI Intertidal Survey
- Technical Appendix 5.4 – Hunterston Construction Yard Underwater Noise Modelling
- Technical Appendix 5.5 – Hunterston Construction Yard Biosecurity Plan
- Technical Appendix 5.6 – Hunterston Construction Yard Marine Mammal Risk Assessment
- Technical Appendix 5.7 – Hunterston Construction Yard Wintering Bird Survey Report
- Technical Appendix 5.8 – Hunterston Construction Yard BNG Feasibility Assessment
- Technical Appendix 5.9 – Hunterston Construction Yard Basking Shark Risk Assessment
- Technical Appendix 5.10 – Biodiversity Enhancement and Management Plan

Details of the site and the proposed development are provided in Chapter 2: Proposed Development.

The purpose of this chapter is to:

- Identify and describe the baseline for Important Ecological Features (IEFs) which may be impacted by the proposed development.
- Identify all potentially significant ecological impacts associated with the proposed development.
- Set out the mitigation measures required to ensure compliance with nature conservation legislation and to address adverse impacts.
- Identify how mitigation measures will be secured.
- Provide an assessment of the significance of any residual impacts.
- Set out the requirements for post-construction monitoring.
- Detail actions to be taken to deliver biodiversity enhancements.

5.2 Scoping and Consultation

Potential impacts to the following features have been considered within this assessment, based on the results of baseline studies (Technical Appendices 5.1, 5.2, 5.3 and 5.7) and in response to scoping opinions (as described in Chapter 3):

- Designated sites
- Terrestrial habitats
- Terrestrial protected species
- Ornithology
- Intertidal habitats
- Marine mammals
- Fish

It is recognised that the project has potential to impact sub-tidal habitats and fauna. A subtidal survey will be undertaken by Seastar Survey Ltd in May and June 2024, the results of this assessment and related impact assessment will be provided as an addendum report.

5.2.1 Potential Impacts and Zone of Influence

Potential impacts considered during scoping were as follows:

Construction phase:

- Loss of terrestrial habitat within the footprint of the development.
- Loss of intertidal habitat within the footprint of the development.
- Alteration of coastal processes as a result of dredging and additional coastal infrastructure which could impact on intertidal habitats and species assemblages.
- Reduction in water quality as a result of dredging, either through increased sediment suspension in the dredge plume and/or chemical contamination of the sediment, which could impact intertidal habitats and species assemblages.
- Generation of underwater noise from capital dredging, placement of rock (including temporary grounding pad) and mooring dolphin piling works which could impact marine mammals and fish.
- Increased risk of pollution incidents from accidental spills from vessels, plant and on-site storage of fuels or chemicals.
- Increased air-borne noise through construction activities (dredging, piling, plant movement, etc.) which could impact birds and terrestrial species.
- Increased visual stimuli through construction activities (personnel and plant movement, etc.) which could impact birds and terrestrial species.
- Increased artificial lighting which could disturb and/or displace terrestrial and marine species..
- Additional vessel movements enhancing the risk of introduction and spread of marine invasive non-native species (mINNS) and collision risk with marine mammals and basking sharks.

Operational phase :

- Alteration of coastal processes as a result of maintenance dredging and additional coastal infrastructure which could impact on intertidal habitats and species assemblages
- Increased artificial lighting which could disturb and/or displace terrestrial and marine species.
- Additional vessel movements enhancing the risk of introduction and spread of marine invasive non-native species (mINNS) and collision risk with marine mammals and basking shark.
- Reduction in water quality as a result of dredging, either through increased sediment suspension in the dredge plume and/or chemical contamination of the sediment, which could impact intertidal habitats and species assemblages..
- Generation of underwater noise from maintenance dredging/removal of temporary grounding pad which could impact marine mammals and fish..
- Increased air-borne noise through operational activities (dredging, plant movement, etc.) which could impact birds and terrestrial species.
- Increased visual stimuli through operational activities (personnel and plant movement, etc.) which could impact birds and terrestrial species
- Increased risk of pollution incidents from accidental spills from vessels, plant and on-site storage of fuels or chemicals including release via site drainage.

[2] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester. Available at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf (Accessed 11/01/2024)

- Additional vessel movements enhancing the risk of introduction and spread of marine invasive non-native species (mINNS) and collision risk with marine mammals and basking sharks.

The CIEEM Guidelines identify the Zone of Influence (ZoI) as the area over which ecological features may be subject to significant effects as a result of the proposed development and associated activities. This is likely to extend beyond the proposed development site, for example where there are mobile species or hydrological links beyond the site boundaries. Features found to be present or likely to be present within the predicted Zone of Influence (ZoI) and which have potential to be significantly affected (positively and negatively) by the proposed development are included within the scope of this assessment. The features considered, associated ZoI, scoping decision and justification are summarised in Table 5-1 below. Where impacts to features are considered to be similar, these have been grouped within the scoping and impact assessment for succinctness (e.g. marine mammals within the same hearing group).

Potential impacts to the following features have been considered within this assessment, based on the results of baseline studies (Technical Appendices 5.1, 5.2, and 5.3) and in response to scoping opinions (as described in Chapter 3):

- Designated sites
- Terrestrial habitats
- Terrestrial protected species
- Intertidal and sub-tidal habitats
- Marine mammals
- Fish

Table 5-1: Scoping Summary

Feature	ZoI	Scoping Decision	Justification
Designated sites			
Southannan Sands Site of Special Scientific Interest (SSSI) • Sandflats	Within the development footprint and to the furthest dispersal distance sediment arising from dredging or pollutants entering the water.	**Scoped in**	The sandbank feature is within the ZoI and there is potential for significant effects to arise.
Kames Bay SSSI • Sandflats	Within the development footprint and to the furthest dispersal distance sediment arising from dredging or pollutants entering the water.	**Scoped in**	The SSSI is within the ZoI and there is potential for significant effects to arise.
Ballochmartin Bay SSSI • Sandflats	Within the development footprint and to the furthest dispersal distance sediment arising from dredging or pollutants entering the water.	**Scoped in**	The SSSI is within the ZoI and there is potential for significant effects to arise.
Portencross Woods SSSI • Upland Mixed Ash Woodland	Within the footprint of the development or range of hydrological connections.	Scoped out	The SSSI is outwith the ZoI and no effects are predicted.
Glen Burn Provisional Scottish Wildlife Trust Wildlife Site	Within the footprint of the development or range of hydrological connections.	Scoped out	The development is located approximately 0.7km west of the site and it is unlikely to have any effect on its PWS status.
Campbellton Hill and Water-meadow Scottish Wildlife Trust Wildlife Site	Within the footprint of the development or range of hydrological connections.	Scoped out	The development is located approximately 1km south of the site and is not hydrologically connected. .
Goldenberry Hill Scottish Wildlife Trust Wildlife Site	Within the footprint of the development or range of hydrological connections.	Scoped out	The development is located approximately 1km south of the site and is not hydrologically connected.
Farland Point Scottish Wildlife Trust Wildlife Site	Within the footprint of the development or range of hydrological connections.	Scoped out	The development is located approximately 1.4km north of the site. It is connected through the marine environment, however the primary features of interest relate to terrestrial habitats which are unlikely to be affected.
Terrestrial Habitats:			
Other Neutral Grassland	Within the footprint of the development	Scoped out	All vegetation within the development footprint will be lost. Due to the common and widespread nature of the habitat in the locale and relatively small area of loss, significant effects on this habitat are not predicted.
Sea Buckthorn Scrub	Within the footprint of the development	Scoped out	All vegetation within the development footprint will be lost. Sea buckthorn is not native in Scotland and is not considered to be a habitat of conservation importance. Significant effects are not predicted.
Beach	Within the footprint of the development	Scoped out	These habitats are present within the Planning Application Boundary (PAB) however they are outside the area of proposed works and will be retained.
Sparsely vegetated Urban Land-Open Mosaic Habitat on Previously Developed Land (OMHPDL)	Within the footprint of the development	**Scoped in**	All vegetation within the development footprint will be lost. This habitat provides important foraging and shelter resource for invertebrates there is therefore potential for significant effects.
Developed Land. Sealed Surface	Within the footprint of the development	Scoped out	Habitat not considered to be of ecological importance.
Artificial Unvegetated Unsealed Surface	Within the footprint of the development	Scoped out	Habitat not considered to be of ecological importance.
Built Linear Features	Within the footprint of the development	Scoped out	Habitat not considered to be of ecological importance.
Other Developed Land	Within the footprint of the development	Scoped out	Habitat not considered to be of ecological importance.
Terrestrial Mammals:			
Bats	Within the footprint of the development and up to 50m from the boundary.	Scoped out	There is moderately suitable foraging habitat for bats within the development, however the loss of habitat is considered to be negligible in relation to the presence of similar habitat for bats in the locale.
Badger (*Meles meles*)	Within the footprint of the development and up to 100m from the boundary.	Scoped out	There are no setts within the ZoI and no habitat for sett creation within the development footprint. There will be some loss of sub-optimal foraging habitat for badgers in the locale but this is considered to be negligible in relation to the presence of better quality habitat available in the wider area.
Otter (*Lutra lutra*)	Within the footprint of the development and up to 250m from the boundary.	**Scoped in**	No otter holts or other resting areas have been identified, however they are highly mobile species and could make use of rock armour as shelter in the future. There is also suitable foraging and commuting habitat within the ZoI.
Water vole (*Arvicola amphibius*)	Within the footprint of the development and up to 250m from the boundary.	Scoped out	Although watercourses are present within the ZoI, they are largely unsuitable for water vole and no evidence of present has been identified during surveys.

Feature	ZoI	Scoping Decision	Justification
Hedgehog (*Erinaceus europaeus*)	Within the footprint of the development and up to 50m from the boundary.	Scoped out	There is limited suitable foraging and sheltering habitat within the ZoI. The loss of habitat is considered to be negligible in relation to the presence of better quality habitat for hedgehog in the locale.
Brown Hare (*Lepus europaeus*)	Within the footprint of the development and up to 50m from the boundary.	Scoped out	There is limited suitable foraging habitat within the ZoI. The loss of habitat is considered to be negligible in relation to the presence of better quality habitat for brown hare in the locale.
Ornithology:			
Wintering Birds	Within the development footprint and to the furthest dispersal distance sediment arising from dredging or pollutants entering the water.	**Scoped in**	There are both high and low tide roosting areas within the ZoI and there is potential for significant effects to arise.
Other Species:			
Amphibians • Common frog (*Rana temporaria*) • Common toad (*Bufo bufo*) • Palmate newt (*Lissotriton helveticus*)	Within the footprint of the development and up to 50m from the boundary.	Scoped out	There is limited foraging habitat within the ZoI. The loss of habitat is considered to be negligible in relation to the presence of better quality habitat for amphibians in the locale.
Reptiles • Common lizard (*zootoca vivipara*) • Slow worm (*anguis fragilis*)	Within the footprint of the development and up to 50m from the boundary.	Scoped out	Although there is suitable foraging, basking and shelter habitat within the ZoI, the loss of habitat is considered to be negligible in relation to the presence of similar, better connected habitat for reptiles in the locale.
Invertebrates.	Within the footprint of the development	Scoped out	There will be loss of suitable habitat for a variety of species within the ZoII, which could have significant effects, however, potential effects on invertebrates are discussed within the context of OMHPDL.
Inter-tidal habitats:			
• Littoral sand • Strandline • Barren Littoral Shingle • Polychaete/amphipod-dominated fine sand shores • *Zostera noltei* beds in littoral muddy sand • *Pelvetia canaliculata* on sheltered littoral fringe rock • *Fucus vesiculosus* on mid eulittoral mixed substrata • *Fucus serratus* on full salinity lower eulittoral mixed substrata • Fucoids on sheltered marine shores • *Semibalanus balanoides*, *Patella vulgata* and *Littorina* spp. on exposed to moderately exposed or vertical sheltered eulittoral rock • Polychaetes in littoral fine sand • Polychaete/bivalve-dominated muddy sand shores • *Lanice conchilega* in littoral sand • Littoral mixed sediment • Mussels on mixed sediment • Polychaete/bivalve-dominated mid estuarine mud shores • *Fucus spiralis* on sheltered variable salinity upper eulittoral rock	Within the development footprint and to the furthest dispersal distance sediment arising from dredging or pollutants entering the water.	**Scoped in:** Zostera noltei beds in littoral muddy sand, Mussels on mixed sediment. Scoped out: all additional intertidal habitats	The following habitats are present within the ZoI (according to Technical Appendix 5.3) and be subject to potential significant effects due to dredging: • Littoral Sand • Littoral mixed sediment • *Lanice conchilega* in littoral sand • Polychaetes in littoral fine sand • Mussels on mixed sediment • *Zostera noltei* beds in littoral muddy sand Seagrass and Mussel beds are PMFs and are considered to be a habitat of high ecological importance. They present within the predicted ZoI there is potential for significant affects and they have therefore been scoped in. The habitats scoped out are either outwith the predicted ZoI or are widespread and common habitats which are not considered to be of conservation importance themselves or for any associated protected species, or the habitats correlate to the sandbank habitat which is assessed under Southannan Sands SSSI.
Marine Mammals			
Grey and harbour seals (*Halichoerus grypus* and *Phoca vitulina*)	Within the development and to the furthest extent of predicted noise effects on seals (c.6.2km from activities) or within dispersal distance of pollutants entering the water.	**Scoped in**	These species are known to be present within the waters and coastal habitats within proximity of the site and there is suitable habitat for commuting and foraging individuals within the ZoI.

Feature	ZoI	Scoping Decision	Justification
Harbour Porpoise (*Phocoena phocoena)*	Within the development and to the furthest extent of predicted noise effects (c.8kmm from activities) or within dispersal distance of pollutants entering the water.	**Scoped in**	Harbour Porpoise are known to be present within the waters and coastal habitats within proximity of the site and there is suitable habitat for commuting and foraging individuals within the ZoI.
Minke Whale (*Balaenoptera acutorostrata*), ,	Within the development and to the furthest extent of predicted noise effects (approximately 8kmm from activities) or within dispersal distance of pollutants entering the water.	**Scoped in**	These species are known to be present within the waters and coastal habitats within proximity of the site and there is suitable habitat for commuting and foraging individuals within the ZoI.
Bottlenose dolphin (*Tursiops truncates*) and Killer whale (Orcinus orca)	Within the development and to the furthest extent of predicted noise effects (up to c.1.8km from activities) or within dispersal distance of pollutants entering the water.	**Scoped in**	These species are known to be present within the waters and coastal habitats within proximity of the site and there is suitable habitat for commuting and foraging individuals within the ZoI.
Fin whale (*Balaenoptera physalus*), long-finned pilot whale (*Globicephala melas*), Atlantic white-sided dolphin (*Lagenorhynchus acutus*), short-beaked common dolphin (*Delphinus delphis*), sperm whale (*Physeter macrocephalus*), humpback whale (*Megaptera novaeangliae*), Sei whale (*Balaenoptera borealis*), striped dolphin (*Stenella coeruleoalba*), Cuvier's beaked whale (*Ziphius cavirostris*), short-finned pilot whale (*Globicephala macrorhynchus*), Risso's Dolphin (*Grampus griseus*), White-beaked Dolphin (*Lagenorhynchus albirostris*),	Within the development and to the furthest extent of predicted noise effects (up to c.1.8-8kmm from activities) or within dispersal distance of pollutants entering the water.	Scoped out	The known species distribution, habitat preferences and lack of records of these species within the vicinity of the Proposed Development indicate they are not present regularly and are unlikely to be significantly affected by the development.
Fish			
Diadromous fish (sea trout (S*almo trutta*) and Atlantic salmon (*Salmo sala)*)	Within the development and to the furthest extent of predicted noise effects (c.1.8km from activities) or within dispersal distance of pollutants entering the water or suspended sediment from dredging.	**Scoped in**	Both sea trout and Atlantic salmon are known to be present within the waters and coastal habitats within proximity of the site and there is suitable habitat for commuting and foraging individuals within the ZoI.
Marine fish PMFs;	Within the development and to the furthest extent of predicted noise effects (c.1.8km from activities) or within dispersal distance of pollutants entering the water or suspended sediment from dredging.	**Scoped in:**	Multiple PMF marine fish species with nursery and spawning grounds are considered likely to be present within the waters and coastal habitats within proximity of the site and there is suitable habitat for commuting and foraging individuals within the ZoI. The species scoped in are based on high level desk study data. The species and associated impact assessment will require to be reviewed once sub-tidal surveys have been conducted, confirming habitat present and associated species observed.
Basking shark	Within the development and to the furthest extent of predicted noise effects (approximately 1.8km from activities) or within dispersal distance of pollutants entering the water.	**Scoped in**	Basking shark is known to be present within the waters and coastal habitats within proximity of the site and there is suitable habitat for commuting and foraging individuals within the ZoI.

5.3 Policy, Legislation and Guidance

The compilation of this chapter has taken cognisance of the legislation, planning policies, conservation initiatives and general guidance presented in Table 5-2 below.

Table 5-2: Legislation, Policy and Guidance Documents

Scope	Document
International	• International Union for the Conservation of Nature (IUCN) Red List of Threatened Species
European	• Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (The Habitats Directive) • Water Framework Directive (WFD) 2000/60/EC of the European Parliament • Environmental Impact Assessment (EIA) Directive (2014/52/EU) on assessing the potential effects of projects on the environment.
Scottish	• Wildlife and Countryside Act 1981 (as amended) (WCA) • The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) • The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 • National Planning Framework 4[3] • Scotland's National Marine Plan[4] • Scottish Biodiversity List (SBL)[5] • Priority Marine Features (PMFs) list[6] • Scotland's Biodiversity Strategy to 2045[7]
Local Planning Policy & Other Advice Documents	• Marine Biosecurity Planning Guidance[8] • BS 42020:2013: Biodiversity Code of Practice for Planning and Development 2013 • North Ayrshire Local Biodiversity Action Plan (LBAP)[9] • North Ayrshire Local Development Plan (LDP)[10] • CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, Version 1.2

[3] Available at: https://www.gov.scot/publications/national-planning-framework-4-revised-draft/ (Accessed 11/01/2024)
[4] Scottish Government (2015) Scotland's Marine Plan, A Single Framework for Managing our Sea. Available online at: https://www.gov.scot/publications/scotlands-national-marine-plan/ (Accessed 11/01/2024)
[5] Available at: https://www.nature.scot/doc/scottish-biodiversity-list (Accessed 11/01/2024)
[6] Available at: https://www.nature.scot/doc/priority-marine-features-scotlands-seas-habitats (Accessed 11/01/2024)
[7] Available at: https://www.gov.scot/publications/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/documents/ (Accessed 11/01/2024)
[8] Payne, R.D., Cook, E.J. and Macleod, A. (2014). Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction of non-native species. Report by SRSL Ltd. in conjunction with Robin Payne to the Firth of Clyde Forum and Scottish Natural Heritage. Available online at: https://www.webarchive.org.uk/wayback/archive/20210929132843mp_/https://www.nature.scot/sites/default/files/2019-02/Marine%20Biosecurity%20Planning.pdf (Accessed 11/01/2024)
[9] North Ayrshire Local Biodiversity Action Plan 2019-203 Available at: https://www.north-ayrshire.gov.uk/Documents/CorporateServices/Finance/approved-lbap.pdf (Accessed 11/01/2024)
[10] The North Ayrshire Local Development Plan 2019 Available at: https://www.north-ayrshire.gov.uk/planning-and-building-standards/ldp/local-development-plan.aspx (Accessed 11/01/2024)
[11] SWSEIC. Available at: https://swseic.org.uk/ (Accessed, November 2023).
[12] Marine Scotland Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters, Scottish Marine and Freshwater Science, Vol 11 No 12, available at: https://data.marine.gov.scot/sites/default/files/Scottish%20Marine%20and%20Freshwater%20Science%20%28SMFS%29%20Vol%2011%20No%2012%20Regional%20baselines%20for%20marine%20mammal%20knowledge%20across%20the%20North%20Sea%20and%20Atlantic%20areas%20of%20Scottish%20waters.pdf

5.4 Methodology

5.4.1 Desk study

A desk study was conducted in October 2023 to gather baseline data in relation to site. The following sources were checked:

- NatureScot Sitelink website for statutory designated sites up to 10km from the site;
- North Ayrshire LDP for non-statutory designated sites up to 1km from the site;
- The North Ayrshire LBAP;
- Biological records from Southwest Scotland Environmental Information Centre (SWSEIC)[11] from 2013-2023 up to 2km of the site; and
- The Scottish Biodiversity List (SBL).

The following sources were accessed in October-December 2023 to inform the marine mammal and fish baseline assessment:

- Marine Directorate Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters [12] and appendices[13];
- JNCC Report No 680: Updated abundance estimates for cetacean management units in UK waters[14];
- Records from South West Scotland Environmental Information Centre (SWSEIC)[15];
- NBN Atlas[16] for commercially available records of marine mammals and fish within 20km from the site;
- Sea Watch Foundation (SWF)[17 & 18] for sightings of marine mammals;
- Hebridean Whale and Dolphin Trust (HWDT)[19] for records of marine mammals up to 20km and basking sharks up to 50km from the site;
- The Shark Trust basking shark sightings[20] for sightings of basking sharks within 20km of the site;
- NatureScot Basking shark satellite tagging project, Commissioned Report[21];
- Scottish Marine Animal Stranding Scheme (SMASS)[22] for records of marine strandings up to 20km from the site;

[13] Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters: Appendix 3 - SCANS surveys Scottish Marine and Freshwater Science Vol 11 No 12, available at: https://data.marine.gov.scot/sites/default/files//Scottish%20Marine%20and%20Freshwater%20Science%20%28SMFS%29%20Vol%2011%20No%2012_%20Regional%20baselines%20for%20marine%20mammal%20knowledge%20across%20the%20North%20Sea%20and%20Atlantic%20areas%20of%20Scottish%20waters%20-%20Appendix%203%20SCANS%20surveys%20%281%29.pdf
[14] IAMMWG. 2022. Updated abundance estimates for cetacean Management Units in UK waters. JNCC Report No. 680 (Revised March 2022), JNCC Peterborough, ISSN 0963-8091. Available at: https://data.jncc.gov.uk/data/3a401204-aa46-43c8-85b8-5ae42cdd7ff3/jncc-report-680-revised-202203.pdf (Accessed 09/05/2024)
[15] South West Scotland Environmental Information Centre available at: https://swseic.org.uk/
[16] NBN Atlas for records of marine mammals, seals and fish, available at: https://scotland-records.nbnatlas.org/explore/your-area#55.7368|-4.8886|13|ALL_SPECIES last accessed 23/10/2023
[17] Sea Watch Foundation Cetaceans of Western Scotland available at: https://seawatchfoundation.org.uk/wp-content/uploads/2012/07/WesternScotland.pdf last accessed 19/10/2023
[18] Sea Watch Foundation Recent Sightings South West Scotland and Inner Hebrides available at: https://www.seawatchfoundation.org.uk/recentsightings/ last accessed 19/10/2023
[19] HWDT whale and dolphin sightings map, available at: https://whaletrack.hwdt.org/sightings-map/ last accessed 31/10/2023
[20] The Shark Trust basking shark sightings available at: https://www.sharktrust.org/basking-shark-project last accessed 19/10/2023
[21] Witt, M.J., Doherty, P.D., Godley, B.J. Graham, R.T. Hawkes, L.A. & Henderson, S.M. 2016. Basking shark satellite tagging project: insights into basking shark (Cetorhinus maximus) movement, distribution and behaviour using satellite telemetry. Final Report. Scottish Natural Heritage Commissioned Report No. 908.
[22] Species reported within a 10km (sea route) to Scottish Marine Animal Stranding Scheme (SMASS) available at: https://strandings.org/map/ last accessed 19/10/2023

- Marine Directorate Updated Seal Usage Maps: The Estimated at-sea Distribution of Grey and Harbour Seals[23], which includes data obtained from the Sea Mammal Research Unit at St Andrews University[24]; and
- Marine Directorate National Marine Plan interactive (NMPi) for:
    - Location of marine designated sites;
    - Seal haul out sites;
    - Distribution of Priority Marine Features

5.4.2 Field Studies and Supporting Assessments

A Preliminary Ecological Appraisal was undertaken by EnviroCentre Ecologist Luigi Cristofaro QCIEEM on 27th October 2023. Full details of the survey can be found in the relevant Technical Appendices: 5.1.

An intertidal survey was undertaken by Seastar Survey Ltd in accordance with Common Standards Monitoring guidance (JNCC, 2004) and procedural guidelines outlined in the Marine Monitoring Handbook (Davies et al., 2001) and the CCW Handbook for Marine Intertidal Phase I Survey and Mapping (Wyn, et al., 2006). The surveys were undertaken from the 8th – 10th April 2024. Further details can be found in Technical Appendix 5.3.

An underwater noise assessment was produced by RPS Limited and is provided as Technical Appendix 5.4. The assessment has included consideration of impact from piling from both the dolphin and quay wall construction. It is noted that since the assessment was undertaken the approach to construction has been revised so that the quay wall piling will be undertaken in the terrestrial environment with material in front of the wall being removed following the piling works. As such the impacts associated with the quay piling works are not considered to represent a risk in relation to underwater noise impact and are not taken forward to the impact assessment. For dredging the modelling has adopted a trailer suction hopper dredger as this is considered to be the worst case option in relation to the underwater noise impact.

5.4.3 Evaluation of Important Ecological Features

The evaluations are applied to those sites, habitats and species that have been scoped into the assessment. These are termed Important Ecological Features (IEFs).

European, national and local governments and specialist organisations have together identified a large number of sites, habitats and species that provide the key focus for biodiversity conservation in the UK and Ireland, supported by policy and legislation. These provide an objective starting point for identifying the important ecological features that need to be considered. Table 5-3 shows a procedure for determining the geographical level of importance of site designations, habitats and species. Where a feature is important at more than one level in the table, its overriding importance is that of the highest level. Usually only the highest level of legal protection is listed.

Table 5-3: Geographical Level of IEFs

Level of Importance	Sites	Habitats	Species
International	Designated, candidate or proposed Special Areas of Conservation, Special Protection Areas and Ramsar sites; UNESCO (Ecological) World Heritage Sites; UNESCO Biosphere Reserves; Biogenetic Reserves.	A viable area of habitat included in Annex I of the EC Habitats Directive; a habitat area that is critical for a part of the life cycle of an internationally important species.	A European Protected Species; an IUCN Red Data Book species that is globally Vulnerable, Endangered or Critically Endangered.
National (UK)	Sites of Special Scientific Interest; National Nature Reserve; Marine Conservation Zones (UK offshore).	An area of habitat fulfilling the criteria for designation as an SSSI or MCZ; a habitat area that is critical for a part of the life cycle of a nationally important species; ancient woodland	An IUCN Red Data Book species that is Vulnerable, Endangered or Critically Endangered in the UK; a species that is Rare in the UK (<15 10km grid squares); a Schedule 5 (animal) or Schedule 8 (plant) species included in the Wildlife and Countryside Act (WCA) 1981; any species protected under national (UK) legislation where there is the potential for a breach of the legislation; a species that is Vulnerable, Endangered or Critically Endangered in The Vascular Plant Red Data List for Great Britain[25].
National (Scotland)	National Parks; Marine Protected Areas; Marine Consultation Areas.	Scottish Biodiversity List (SBL) Priority Habitats and Priority Marine Features (PMFs)[26] (Scotland).	Species of principal importance for biodiversity in the relevant countries[27], including; SBL Priority Species and PMFs (Scotland). Species protected under the Marine Scotland Act 2010.
Regional	Regional Parks (Scotland).	Regional Local Biodiversity Action Plan habitats noted as requiring protection.	A species that is Nationally Scarce in the UK (present in 16-100 10km grid squares); a species that is included in the Regional LBAP; an assemblage of regionally scarce species.

[23] Updated Seal Usage Maps: The Estimated at-sea Distribution of Grey and Harbour Seals, Scottish Marine and Freshwater Science, Vol 8 No 25, available at: https://data.marine.gov.scot/sites/default/files//SMFS%200825.pdf
[24] St Andrews Sea Mammal Research Unit, available at: http://www.smru.st-andrews.ac.uk/
[25] Cheffings, C.M. & Farrell, L. (eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. (2005) *The Vascular Plant Red Data List for Great Britain. Species Status No. 7*. JNCC, Peterborough. Available at: https://hub.jncc.gov.uk/assets/cc1e96f8-b105-4dd0-bd87-4a4f60449907 (Accessed 11/01/2024)
[26] In July 2014, Scottish Ministers adopted a list of 81 priority marine features (PMFs) – many of which are features characteristic of the Scottish marine environment. Most are on other conservation status lists so may be valued higher than this.
[27] These are all the species that were identified as requiring action in the UKBAP and continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework, including any additions.

Level of Importance	Sites	Habitats	Species
County / Metropolitan	Woodland Trust Sites; Royal Society for the Protection of Birds Sites; Scottish Wildlife Sites.	County LBAP habitats noted as requiring protection.	A species that is included in the County LBAP; an assemblage of species that are scarce at the county level.
Local		Semi-natural habitats that are unique or important in the local area.	Species as defined by Local Authority lists (if available).
Site		Common and widespread habitats not covered above.	Common and widespread species not covered above.
Negative			An Invasive Non-Native Species (INNS) as defined by the GB Non-Native Species Secretariat (NNSS) and supported by the GB Invasive Non-native Species Strategy (2015); legally controlled species under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended by the relevant country legislation).

5.4.4 Impact Assessment

Assessment Criteria – Magnitude

The CIEEM guidance states that when describing changes/activities and positive or negative impacts, reference should be made to the following parameters where relevant:

- Magnitude;
- Extent;
- Duration;
- Reversibility; and
- Timing and frequency.

Magnitude refers to the size, amount, intensity and volume of an impact, determined on a quantitative basis if possible, but typically expressed in terms of relative severity, such as major, moderate, low or negligible. Extent, duration, reversibility, timing and frequency of the impact can be assessed separately but they tie in to determine the overall magnitude.

Criteria for describing the magnitude of an impact are presented in Table 5-4 below:

Table 5-4: Criteria for Describing Magnitude of Impact

Magnitude	Description
Major	Total or major loss or alteration to the IEF, such that it will be fundamentally changed and may be lost from the site altogether; and/or loss of a very high or high proportion of the known population or range of the IEF.
Moderate	Loss or alteration to the IEF, such that it will be partially changed; and/or loss of a moderate proportion of the known population or range of the IEF.
Low	Minor shift away from the existing or predicted future baseline conditions. Change arising from the loss or alteration will be discernible but the condition of the IEF will be similar to the pre-development conditions; and/or having a minor impact on the known population or range of the IEF.
Negligible	Very slight change from the existing or predicted future baseline conditions. Change barely discernible, approximating to the 'no change' situation; and/or having a negligible impact on the known population or range of the IEF.

Assessment Criteria – Significance

Significance is a concept related to the weight that is attached to effects when decisions are made. For the purposes of ECIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for IEFs. In broad terms, significant effects encompass effects on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution).

Significant effects are quantified with reference to an appropriate geographic scale (see Table 5-3 above). The CIEEM guidance has one 'level of importance' and a geographical 'scale of significance'. This is to deal with the fact that the geographical scale at which the effect is significant is not necessarily the same as the geographic level of importance of the IEF.

A sensitivity scale is used to assist in the determine the significance of effects, as shown in Table 5-5:

Table 5-5: Sensitivity of Important Ecological Features

Sensitivity	Definition
High	Tolerance: The IEF has a very limited tolerance of the effect.
	Adaptability: The IEF is unable to adapt to the effect.
	Recoverability: The IEF is unable to recover, resulting in permanent or long term (>10 years) change.
Medium	Tolerance: The IEF has limited tolerance of the effect.
	Adaptability: The IEF has limited ability to adapt to the effect.
	Recoverability: The IEF is able to recover to an acceptable status over the medium term (5-10 years).
Low	Tolerance: The IEF has some tolerance of the effect.
	Adaptability: The IEF has some ability to adapt to the effect.
	Recoverability: The IEF is able to recover to an acceptable status over the short term (1-5 years).
Negligible	Tolerance: The IEF is generally tolerant of the effect.
	Adaptability: The IEF can completely adapt to the effect with no detectable changes.
	Recoverability: The IEF is able to recover to an acceptable status near instantaneously (<1 year).

Consideration of conservation status is important for assessing the significance of effects of impacts on individual habitats and species. The Habitats Directive provides a helpful definition of conservation status for habitats and species (as defined by Articles 1 (e) and 1(i)):

For habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area; and

The conservation status of natural habitats will be taken as 'favourable' when:

i. its natural range and areas it covers within that range are stable or increasing, and
ii. the species structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future, and
iii. the conservation status of its typical species is favourable as defined in Article 1(i).

For species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.
The conservation status of species will be taken as 'favourable' when:

i. population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
ii. the natural range of the species is neither being reduced for the foreseeable future, and
iii. there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The scientific evidence gathered during the assessment process is used along with professional judgement where appropriate to determine the significance of effects according to the guidance above. Where it is not possible to justify a conclusion of no significant effect, a significant effect is assumed based on the Precautionary Principle.

Assessment Criteria – Confidence in Predictions

CIEEM does not cover levels of confidence in predictions adequately, therefore an approach has been adopted based on river conservation evaluation[28]. A simple, qualitative index based on professional judgement is assigned to each predicted effect as follows:

A: high confidence.
B: intermediate confidence.
C: low confidence.

Factors influencing confidence include:

- The frequency and effort of field sampling;
- Constraints to the field survey;
- The completeness of the data (field and desk);
- The age of the data (although recent data are not necessarily always more reliable than old data);
- The state of scientific knowledge relating to the predicted effects of development activities on the IEF (the accuracy of the magnitude assessment); and
- The accuracy of the assessment of significance.

Assessment Criteria – Success of Mitigation

The word ‘mitigation’ has developed a wider meaning and common usage in environmental assessment than its strict meaning related to reducing the severity of something. Mitigation can sometimes be used as a generic term for a wide range of counter-acting measures, all of which, as the Directive and Regulations prescribe, are intended to *prevent, reduce and where possible offset any significant adverse effect on the environment*. Mitigation can be used to encompass measures intended to avoid, minimise or compensate for adverse effects (this is the ‘mitigation hierarchy’).

Mitigation and compensation measures often carry a degree of uncertainty. Uncertainty associated with a design will vary according to a number of factors, such as:

- The technical feasibility of what is proposed;
- The overall quantity of what is proposed;
- The overall quality of what is proposed;
- The level of commitment provided to achieve what is proposed;
- The provision of long-term management; and
- The timescale for predicted benefits.

The following objective scale is used for the success of mitigation:

- Certain/near certain: probability estimated at 95% chance or higher.
- Probable: probability estimated above 50% but below 95%.
- Unlikely: probability estimated above 5% but less than 50%.
- Extremely unlikely: probability estimated at less than 5%.

5.5 Baseline

5.5.1 Designated Sites

5.5.1.1 *Southannan Sands SSSI*

Southannan Sands SSSI is located adjacent to the development and comprises three separated coastal sections of inter-tidal sandflat habitat (designated feature) along the Clyde coastline. The three sections of the SSSI are named, Hunterston Sands (located south of the HCY, Southannan Sands (located just north and east of the HCY and Fairlie Sands, located approximately 500m north. The inter-tidal sediment composition of the sandflats comprises primarily medium sheltered sands, with a small area of mud/silt present at Fairlie Sands. The feature condition was last assessed in 2016 as ‘Favourable Maintained’ with no negative pressures listed.

5.5.1.2 *Kames Bay SSSI*

Kames Bay SSSI is located approximately 2.2km northwest of the development along the southern section of Great Cumbrae island and comprises a small, but ecologically important section of inter-tidal sandflats (designated feature). The shoreline extends for approximately 0.5km. The inter-tidal sediment composition of the sandflats comprises primarily sand. The sands never experience severe drying through the seasons, resulting in high faunal populations. The bay is also exposed to seawater seepage from a section of dipped rocks located west of the bay leading to a variety of salinity profiles within the bay and resulting in the presence of organisms more typical of estuarine conditions. The feature condition was last assessed in 2014 as ‘Favourable Maintained’ with no negative pressures listed.

5.5.1.3 *Ballochmartin Bay SSSI*

Ballochmartin Bay SSSI is located approximately 2.9km north of the development along the eastern section of Great Cumbrae island and comprises a section of inter-tidal sandflats (designated feature). The shoreline within the bay extends for approximately 2km. The inter-tidal sediment composition of the sandflats comprises primarily mixed shingle and sands with clay underneath. Unlike the nearby Kames Bay SSSI, minimal freshwater seepage is present, and the salinity conditions of the bay waters are considered to be fully marine. The feature condition was last assessed in 2012 as ‘Favourable Maintained’ with no negative pressures listed.

[28] SERCON: System for Evaluating Rivers for Conservation, Version 2, Technical Manual. Scottish Natural Heritage (2001).

5.5.2 Terrestrial Habitats

This section should be read in conjunction with Technical Appendix 5.1

5.5.2.1 *Sparsely Vegetated Urban Land (OMHPDL)*

Sparsely vegetated urban land is located within the majority of the operational grounds and comprises an area of open mosaic habitat over previously developed land over derelict and disused urban features, including car parks, roads and structures, which have become sparsely vegetated by ruderal vegetation such as creeping bent (*Agrostis stolonifera*) and creeping buttercups (*Ranunculus repens*), with occasional patches of purple moor-grass (*Molinia caerulea*), sea buckthorn (*Hippophae rhamnoides*) scrub and stonecrop (*Sedum spp*.). Various bryophytes are also found scattered throughout.

This habitat fits the criteria for the SBL priority habitat Open Mosaic Habitat on Previously Developed Land. There is 2.36ha present within the development site, which has formed via natural succession of vegetation following the cessation of activities at the site. The main value of the habitat is considered to be the diverse range of habitat niches provided for sheltering and foraging invertebrates. By nature it is an ephemeral habitat which in time would transition to more uniform grassland and then scrub/woodland communities.

This habitat is closely associated with urban and industrial sites and is present abundantly on adjacent land within the wider Hunterston Port facility which is similarly no longer in active use.

5.5.3 Terrestrial Mammals

5.5.3.1 *Otter*

The Mammal Red Lists, considers the otter population in Scotland to be vulnerable based on IUCN criteria . Although there had been an increase in the population from the 1970's to the 2000's, there is some evidence of a population decline from the 2000's to the 2010's. The overall population is estimated to be c.8000 individuals with a distribution covering the majority of Scotland, particularly in coastal and riparian habitats.

A total of 21 records of Otter, located approximately 1.4km northwest and 1km south of the site, were returned from SWSEIC[29].

No field signs of otter were recorded during the site visit.

The coastline, comprising sea walls, beaches and sandflats offers opportunities for foraging, commuting and resting otters. Opportunities for holt creation on site are limited due to the extent of artificial cemented surfaces; however, rabbit burrows found along the western site boundary (Photo 15) could provide opportunities for otter, as could gaps in the existing rock armour.

More opportunities for foraging and commuting otters exist on the Burn Gill within the woodland adjacent to the access road. The watercourse is slow flowing, approximately 3m wide, with a water depth varying between 15-40cm and likely hosts prey species such as brown trout (*Salmo trutta*).

Overall, it is likely that otters will use some of the features on or adjacent to the site for foraging, commuting and resting.

5.5.4 Ornithology

Full details for bird species recorded during the survey work can be found Technical Appendix 5.7.

Surveys undertaken in 2023/24 followed the survey methods used for surveys undertaken between 2012 and 2016.

A total of 39 species was recorded during the 2023/2024 surveys which are summarised in Table 5.6 below.

Table 5-6: Summary of Species Recorded and Peak Counts during 2023/2024 Surveys

Species		**Southannan Sands**		**Hunterston Sands**		**Fairlie Sands**	
Scientific name	Common name	Peak	Date	Peak	Date	Peak	Date
Answer brachrhynchis	Pink-footed Goose	-	-	36	10/11/23	-	-
Anas crecca	Teal	288	28/11/23	350	19/12/23	47	31/01/24
Anas penelope	Wigeon	778	06/11/24	733	10/11/23	91	28/02/24
Anas platyrhynchos	Mallard	27	18/12/23	46	10/11/23	12	20/12/23
Anas strepara	Gadwall	2	29/01/24	-	-	-	-
Anser anser	Greylag Goose	98	29/01/24	350	27/02/24	-	-
Ardea cinerea	Grey Heron	37	28/11/23	1	Various	1	Various
Branta canadensis	Canada Goose	20	29/01/24	83	10/11/23	-	-
Bucephala clangula	Goldeneye	7	18/12/23	-	-	2	Various
Calidris alpina	Dunlin	286	28/11/23	94	29/11/23	-	-
Calidris canutus	Knot	-	-	18	10/;11/23	-	-
Charadrius hiaticula	Ringed Plover	6	26/02/24	126	19/12/23	-	-
Chroicocephalus ridibundus	Black-headed Gull	58	18/03/24	18	29/11/23	9	20/03/24
Cygnus olor	Mute Swan	49	28/11/23	-	-	3	20/03/24
Egretta garzetta	Little Egret	2	26/02/24	1	Various	1	Various
Gavia stellata	Red-throated Diver	-	-	2	19/03/24	-	-
Haematopus ostralegus	Oystercatcher	449	18/12/23	220	29/11/23	91	31/01/24
Larus argentatus	Herring Gull	31	26/02/24	17	30/01/24	5	31/01/24
Larus canus	Common Gull	290	18/12/23	52	19/12/23	8	31/01/24

[29] Data Source: IRecord records (2015-2023); Non-avian Taxa (BTO + Partners) (2019).

Species		Southannan Sands		Hunterston Sands		Fairlie Sands	
Scientific name	Common name	Peak	Date	Peak	Date	Peak	Date
Larus fuscus	Lesser Black-backed gull	37	18/03/24	4	19/03/24	2	20/02/24
Larus marinus	Great Black-backed Gull	3	29/01/23	3	30/01/24	2	20/12/23
Limosa lapponica	Bar-tailed Godwit	71	26/02/24	4	19/12/23	50	31/01/24
Limosa limosa	Black-tailed Godwit	1	29/01/24	-	-	2	31/01/24
Mergus merganser	Goosander	4	28/11/23	6	29/11/23	-	-
Mergus serrator	Red-breasted Merganser	10	29/01/24	3	30/01/24	6	20/03/24
Numenius arquata	Curlew	328	26/02/24	50	30/01/24	15	31/01/24
Phalacrocorax aristotelis	Shag	-	-	-	-	3	20/03/24
Phalacrocorax carbo	Cormorant	2	26/02/24	3	30/01/24	-	-
Somateria mollissima	Eider	-	-	6	27/02/24	143	20/03/24
Tachybaptus ruficollis	Little Grebe	12	28/11/23	-	-	-	-
Tadorna tadorna	Shelduck	70	26/02/24	32	10/11/23	2	28/02/24
Tringa nebularia	Greenshank	13	28/11/23	-	-	2	20/12/23
Tringa totanus	Redshank	191	26/02/24	99	29/11/23	12	31/01/24
Vanellus vanellus	Lapwing	10	28/11/23	-	-	-	-

Of the waders recorded, Oystercatcher, Curlew, Redshank, and Dunlin were the most numerous species encountered, with smaller numbers of Greenshank, Ringed Plover, Bar-tailed Godwit and Knot.

Wigeon was by far the most numerous waterfowl species recorded, with smaller numbers of Teal, Greylag Goose, Shelduck, Eider, Mallard, Mute Swan, and Red-breasted Merganser.

Of the three areas surveyed:

- Southannan Sands continues to support the largest concentrations of wader and waterfowl species. With large numbers of Oystercatcher, Curlew, Wigeon, Redshank, and Shelduck regularly present feeding and roosting, with particular note being made of the high concentrations of roosting birds within the artificial lagoon.
- Hunterston Sands supports the highest concentrations of Dunlin and Ringed Plover over the survey area.

All three survey areas provide roosting habitat for Oystercatcher, Curlew, and Redshank, with the north-east corner of Southannan Sands and the artificial lagoon supporting the highest concentrations, with regular counts of up to 300, 200, and 100 birds respectively, with further roosting provisions for Dunlin, Bar-tailed Godwit, and Greenshank in smaller concentrations. On Hunterston Sands, the primary roost location is Inner Brigund Point on the southern side of Hunterston Sands.

The surveys confirm that the species present and general numbers, as well as the main roost sites remain either unchanged or similar (in terms of numbers) than results from previous surveys.

5.5.5 Intertidal Habitats

This section should be read in conjunction with Technical Appendix 5.3

The distribution of the observed features of interest from the intertidal survey, i.e. seagrass beds and blue mussel beds, is shown in Figure 5.1.

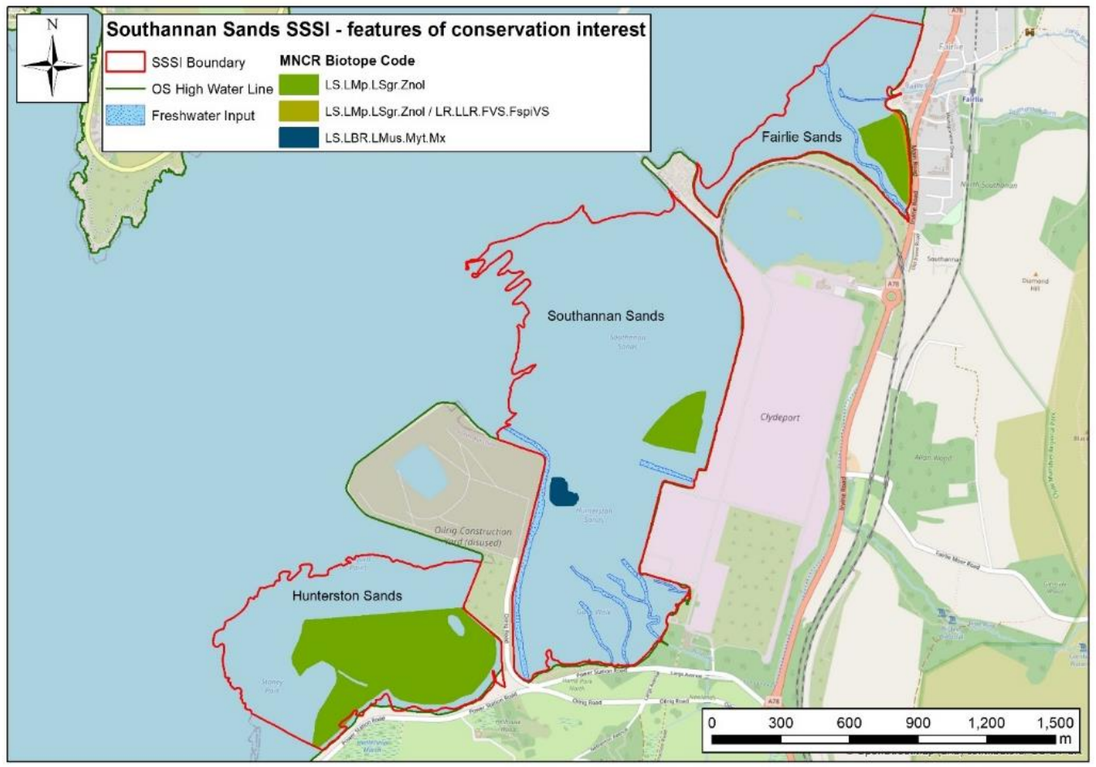


Figure 5-1 Distribution of the features of conservation interest (seagrass beds and mussel beds) identified during the preliminary Phase I survey of Southannan Sands

The seagrass beds identified during the survey covered a total area of approximately 38.04 ha and were recorded in all three subdivisions of the SSSI. All beds comprised *Z. noltei* only (**LS.LMp.LSgr.Znol**). The largest bed was recorded at Hunterston Sands (29.13 ha), however estimated seagrass density was highest in the bed identified at Fairlie Sands (~30 % coverage).

A single blue mussel bed (**LS.LBR.LMus.Myt.Mx**) was identified during the survey. This bed was located in the approximate centre of Southannan Sands on mixed sediment and covered an area of approximately 1.04 ha. Mussels were generally present as clumps rather than as a contiguous bed, and commonly measured between 3 and 5 cm in length. In addition to this bed, an area of dead mussel bed was also recorded at Southannan Sands, just to the north of the extant bed.

5.5.6 Marine Mammals

This section should be read in conjunction with Technical Appendix 5.2 Marine Mammal and Fish Baseline.

5.5.6.1 *Grey Seal and Harbour Seal*

Both harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*) are PMFs and can be seen all around Scotland, predominantly on many of the offshore islands and along much of the west mainland coast.

The latest estimate of the UK harbour seal population is 42,900 with the Southwest Scotland Seal Management Unit (SMU) being home to approximately 4% of that[30]. Whilst the overall trend for harbour seals within the UK is increasing, there has been a dramatic change in distribution with the populations in the north and east generally declining, and western populations increasing. Counts in the Southwest Scotland SMU have been increasing since the 1990s. SWSEIC have recorded 37 harbour seal sightings between 1990-2023 within a 2km radius of the site. SMASS have recorded 49 harbour seal strandings within 20km (shortest route via water) of the site between 1997-2022. Estimated at sea usage for the area around the site is c.1 <5 individuals per 5km^2.

The latest UK grey seal population is estimated to be 162,000 with the Southwest Scotland SMU representing less than 1% of that. Overall population trends are increasing or stable.

SWSEIC have recorded 95 grey seal sightings between 1990-2023 within a 2km radius of the site. SMASS have 30 records of stranded grey seal within 20km between 1995-2022. Estimated at sea usage for the area around the site is c.1 <5 individuals per 5km^2.

No designated seal haul out sites are associated with the Hunterston site, with the nearest being Lady Isle, located approximately 27km south of the site (via shortest route in water) designated as a key site for harbour and grey seals. The nearest grey seal breeding site is located 200km (shortest route via water) northwest at West Oronsay.

5.5.6.2 *Harbour Porpoise*

The harbour porpoise is widely distributed throughout the western region and is common in nearshore waters, especially along the West Highland coast. . They are a Priority marine feature (PMF) and European Protected Species (EPS).

The Proposed Development is located within the West Scotland Management Unit. The most recent population estimates for this are an abundance of 28,936 individuals.

No live sightings of harbour porpoise have been recorded within the development area. 34 records of harbour porpoise have been submitted to SWF in 2023 from south west Scotland and Inner Hebrides consisting of 66 individuals, the closest of which being approximately 20km north west of the development site, offshore of Rothesay Bay in Argyll and Bute May. HWDT have recorded 458 sightings of harbour porpoise within a 20km radius (shortest distance via water) between 2017-2023, with the nearest recorded 2km north west of the site. SMASS have recorded 99 records of harbour porpoise strandings between 1994-2022, with two records associated with the Hunterston site. SWSEIC have recorded 23 records of harbour porpoise between 2004-2020 within a 2km radius of the site. Figure 2-1 shows predicted density surface for harbour porpoise in 2016 using SCANS III survey data. Predicted density within the vicinity of the Proposed Development is 0.3 – 0.5 animals per km2.

5.5.6.3 *Minke Whale*

Minke whale are widely distributed in relatively small numbers, usually observed singly or in pairs. Minke whale tend to reside mainly on the continental shelf in water depths of 200 m or less, often being observed close to land, however have been recorded at depths of 500m. Although minke whale occur year-round, peak numbers and frequency of sightings occur between July and October.

The most recent abundance estimate for the UK portion of the Celtic and Greater North Seas (CGNS) Management Unit (MU) is 10,288.

[30] Natural Environment Research Council (NERC) Special Committee on Seals (2022) Scientific Advice on Matters Related to the Management of Seal Populations: 2022.

No sightings of minke whale have been recorded within the development area. 22 records of minke whale have been submitted to SWF in 2023 from south west Scotland and Inner Hebrides consisting of 20 individuals, the closest of which being approximately 21km south west of the development site, offshore of Brodick bay, Arran. HWDT have recorded 20 sightings of minke whale within a 20km radius (shortest distance via water) between 2017-2023, with the nearest recorded 1.4km north of the site. SMASS have recorded 6 records of minke whale strandings between 1993-2016, with the nearest recorded 6km north west of the Hunterston site. Predicted at sea densities in the vicinity of the Proposed Development are between 0.02 – 0.03 animals per km2.

5.5.6.4 *Killer Whale*

Killer whales are resident year round in Scottish waters but in low densities. Records have mainly been recorded in coastal waters between April and October singly or in groups numbering up to 14 individuals, with peak number of records occurring between June and October. Killer whales sighted in the west of Scotland are thought to belong to a small assemblage that range around Britain and Ireland known as the West Coast Community. There is no reliable estimate on UK population trends.

No sightings of killer whale have been recorded within the development area. One record of killer whale has been submitted to SWF in 2023 from south west Scotland and Inner Hebrides consisting of two individuals, being approximately 23km south of the development site, offshore of Irvine. Two records of killer whale were reported to HWDT within a 20km radius (shortest distance via water) between 2017-2023. No records of killer whale strandings were reported to SMASS within a 20km radius of the development.

5.5.6.5 *Short-beaked Common Dolphin*

Short-beaked common dolphin are not strongly associated with nearshore waters, instead being considered an offshore species, however, sightings off southwest Scotland north to the Isle of Skye are common year round. Peak number of sightings occur between May and early July, declining sharply from August onwards, with groups of 5-20 individuals usually observed (larger groups of up to 500 individuals have been recorded). There is no reliable data on overall population size or trends in the UK.

No sightings of short-beaked common dolphin have been recorded within the development area. A total of 22 records of short-beaked common dolphin have been submitted to SWF in 2023 from southwest Scotland and Inner Hebrides consisting of 437 individuals, with the nearest record located within in the Firth of Clyde (no exact location provided) which the site extends into. 31 records of short-beaked common dolphin were reported to HWDT within a 20km radius (shortest distance via water) between 2017-2023. Two short-beaked common dolphin strandings were reported to SMASS within a 20km radius of the development site in 2001 and 2013, with the nearest located approximately 16km south offshore of Saltcoats. SWSEIC returned 11 records of short-beaked common dolphin between 2010-2019 within a 2km radius of the site.

5.5.6.6 *Bottlenose Dolphin*

Bottlenose dolphin are uncommon throughout the year along the west coast of Scotland, although small resident or semi-resident communities numbering 5-20 individuals occur in a few scattered localities (e.g. Barra, Islay, Mull, and the Sound of Sleat). Bottlenose dolphin are observed in the greatest numbers in coastal waters between April and September.

The Proposed Development is within the Coastal West Scotland and the Hebrides MU. The latest abundance estimate for the MU is 45[31].

No sightings of bottlenose dolphin have been recorded within the development area. 11 records of bottlenose dolphin have been submitted to SWF in 2023 from southwest Scotland and Inner Hebrides consisting of 74 individuals, with the nearest located approximately 218km northwest offshore of Ardalanish, Isle of Mull. 86 records of bottlenose dolphin were reported to HWDT within a 20km radius (shortest distance via water) between 2017-2023. No bottlenose dolphin strandings were reported to SMASS within a 20km radius of the development site. SWSEIC have recorded two records of bottlenose dolphin between 201-2022 within a 2km radius of the site.

5.5.7 Fish

This section should be read in conjunction with Technical Appendix 5.2.

5.5.8 Basking Shark

Basking shark can be found in Scottish waters year-round, although they display winter migratory behaviour, with some moving to deeper waters off the Scottish continental shelf, and others travelling south to the Bay of Biscay or the Azures. The highest concentrations of basking shark in Scotland are found along the west coast, around the Hebrides. There is a lack of data to base a population estimate on and no indication as to current population trends.

53 individual basking sharks have been recorded within a 20km radius of the site (via shortest route) between 2015 and 2022, with 15 sightings (totalling 21 basking sharks) also having been reported to HWDT since 2017, within a 50km radius (via shortest route through water), with the nearest being 2.25km north of the site.

5.5.9 Diadromous Fish

Populations of Atlantic Salmon within Scotland are declining with the IUCN conservation status recently updated to ‘Endangered’ within Great Britain (as a result of a 30-50% decline in British populations since 2006 and 50-80% projected between 2010-2025). Sea trout similarly have a declining population with rod catches currently at the lowest ever recorded .

Atlantic salmon and sea trout are known to migrate into the Clyde estuary and coastal streams and rivers. On returning to spawn, salmonids follow the coast. Based on catch data, the Clyde and Ayr Salmon Fishery Statistical District (District 45 and 9 respectively) are not highly significant in national terms[32].

The Burn Gill which is present within the access route of the site, is not considered an Atlantic salmon or seat trout river by Marine Scotland[33]. However, brown/sea trout and brown trout (*Salmo trutta ssp. fario*) have been recorded using the Burn Gill during surveys in 2022 undertaken by RPS to inform the XLCC EIA[34]. The nearest watercourse to the site which is considered to ‘likely host’ salmon by the Marine Directorate is the Gogo Water, approximately 6km north of the site.

To the south, the nearest salmonid rivers on the same coastline, are the Irvine and Garnock, which both have significant and robust salmon and sea trout populations. To the north the Noddsdale Water and Gogo Water at Largs

[31] IAMMWG. 2022. Updated abundance estimates for cetacean Management Units in UK waters. JNCC Report No. 680 (Revised March 2022), JNCC Peterborough, ISSN 0963-8091.
[32] Marine Scotland Salmon and sea trout fishery statistics: 1952 to 2022 season - reported catch by district and method, available at: https://data.marine.gov.scot/dataset/salmon-and-sea-trout-fishery-statistics-1952-2022-season-reported-catch-district-and-method (Accessed 11/01/2024)
[33] Marine Scotland Salmon and Sea Trout – Scottish Salmon Rivers, available ta: https://marine.gov.scot/information/atlantic-salmon-distribution-scotland, last accessed 09/01/2023
[34] XLCC Hunterston Environmental Statement Volume 1 (2022), available at: https://www.eplanning.north-ayrshire.gov.uk/OnlinePlanning/files/AD5A00C8DD23C97A3D2DAC6D37FEF908/pdf/22_00133_PPPM-EIA_REPORT_CHAPTER_5_ECOLOGY_AND_NATURE_CONSERVATION-1048167.pdf (Accessed 11/01/2023)

both have salmon and sea trout runs, although small and precarious. In the inner Clyde estuary there are several salmon rivers, including the Kelvin, Clyde and Leven with large salmon and sea trout runs.

A recent site visit undertaken by EnviroCentre considered the Burn Gill to offer some suitability for European eel (Anguilla anguilla) and lamprey (sea, brook and river).

5.5.10 Other Marine Fish

Species scoped in on the basis of desk study data indicating spawning and/or nursery grounds may be present are provided in Tabe 2-1. Exact numbers of the populations at present are not known. There may be seasonal use by some of the species, or use only within specific periods of the lifecycle. For most of the PMFs, the Proposed Development makes up a relatively small proportion of the known distribution within Scotland.

Table 5-7: Fish PMFs in Relation to Hunterston Development Site

PMF	Spawning Grounds Cover the Site	Nursery Grounds Cover the Site	Distribution Covers the Site
Anglerfish (*Lophius piscatorius*)	No	Yes (low density)	Yes
Atlantic herring [(I)] [(II)]	No	Yes (high density)	Yes
Flapper skate and blue skate (formerly common skate) (*Dipturus intermedius* and *D. batis*) [(I)] [(II)]	Yes	No	Yes
Saithe [(II)]	No	Yes (density undetermined)	Yes
Sandeels (*Ammodytes marinus* & *Ammodytes tobianus*) [(II)]	Yes (low density)	Yes (low density)	Yes
Sand goby [(I)] [(II)]	Highly likely	Highly likely	Yes
Spiny dogfish (*Squalus acanthias*)	No	Yes (high density)	Yes
Whiting [(I)] [(II)]	No	Yes (high density)	Yes

5.5.11 Prediction of Future Baseline

The future baseline scenario, if the proposed development does not go ahead:

- OMHPDL would likely continue its succession towards a scrub or woodland habitat (or grassland if herbivore pressure prevents tree growth.
- Climate change may alter the distribution of marine species within the vicinity of the site, including marine mammals, fish, flora species and invertebrates. Extreme weather events may result in the loss/damage of intertidal habitats due to the death or alteration of component species.

5.5.12 Evaluation

The evaluations have been applied only to those designated sites, habitats and species that have been scoped into the assessment and those where there is the potential for impacts that could result in significant adverse ecological effects as a result of the proposed development. The IEFs and the evaluations are presented in **Error! Reference source not found.** Below.

Table 5-8: Evaluation of Important Ecological Features

IEF	Present on site?	Present in wider area?	Importance	Justification
Southannan Sands	N	Y	National (UK)	Nationally designated site
Kames Bay	N	Y	National (UK)	Nationally designated site
Ballochmartin Bay	N	Y	National (UK)	Nationally designated site
OMPHDL	Y	Y	National (Scotland)	SBL priority habitat
Wintering Birds	Y	Y	Regional	One of three areas supporting significant numbers waders and waterfowl species between Stranraer and Greenock
Grey and harbour seals	N	Y	National (Scotland)	Protected under the Marine Scotland Act 2010.
Harbour porpoise	N	Y	International	EPS
Minke whale	N	Y	International	EPS
Killer whale	N	Y	International	EPS
Atlantic white-sided dolphin	N	Y	International	EPS
Short-beaked common dolphin	N	Y	International	EPS
Bottlenose dolphin	N	Y	International	EPS
Basking shark	N	Y	International	IUCN Red List Endangered
Diadromous fish (Atlantic Salmon and Sea Trout)	Y	Y	National (Scotland)	PMF
Marine PMFs fish	Y	Y	National (Scotland)	PMF
Seagrass beds	N	Y	International	Annex I Marine Intertidal and Shallow Subtidal Habitats
Blue mussel beds	N	Y	National (Scotland)	PMF

5.6 Impact Assessment

5.6.1 Designated Sites

5.6.1.1 *Southannan Sands*

Construction Impacts

The sandbank habitat could be impacted during the construction phase of the works through increased suspended solids within the water column as a result of dredging. Any subsequent increase in water turbidity associated with increased suspended solids arising from construction activities would be temporary (of the modelled dredge period of 130 days, a period of 8 weeks has been identified as having increased levels of suspended solids). Dredge plume modelling indicates that the area of impact is focussed to the portion of the SSSI north of the HCY. Impacts relevant to the specific PMF habitats found within the SSSI are discussed in section 5.5.18 below.

Dredge plume modelling indicates the depth of sediment deposition outside of the dredge pocket is likely to be <0.001m across all areas (Chapter 9). It is unlikely to have any long-term effects on sandbank habitats. Impacts relevant to the specific PMF habitats found within the SSSI are discussed in section 5.5.18 below.

It is anticipated that recovery from impacts relating to suspended sediment and sediment deposition recovery would be quick (<1 year). The coastal environment is dynamic and species present are generally adapted to a range of conditions, with levels of suspended sediment and deposition varying naturally in relation to weather and tidal conditions.

Release of toxic materials during dredging is not considered to be an issue as sediment sampling found no contaminants at levels likely to significantly affect water quality or pose a hazard to marine life.

There is potential for construction activities to alter the morphology of habitats within the site due to changes to tidal regimes, sediment transportation and slope slump within the dredge pocket. These impacts have been assessed within Chapter 9, Section 9.7.2 as being of negligible significance.

The habitat could also be affected by pollution events such as fuel or oil spills or materials such as cement entering the water either during the construction phase or operation of the quay. This could result in loss or alteration of composition of species present within the habitat. The magnitude would vary depending on the severity of the pollution event and could range from low to high. The impact would be temporary but effects on species within the sandbank habitat could range in duration depending on the type of pollutant and the magnitude of the impact.

The sandbank habitat could also be impacted via the introduction and/or spread of mINNS. This may affect the diversity and distribution of typical species associated with the habitat. The impact would be long term and one which is difficult to reverse. Depending on the nature of the species introduced and how many introductions there are the impacts could be of low to high magnitude.

Impacts during the construction phase will be temporary and are considered to be of **negligible to moderate** magnitude with the receptor being of negligible to **high sensitivity.** The confidence level for the assessment is considered to be high.

Operational Impacts

The sandbank habitat could be impacted during the operational phase of the works through increased suspended solids within the water column as a result of maintenance dredging. Any increase in turbidity associated with an increase in suspended solids arising from dredging activities would be temporary and would last no more than a 2 week period. Dredge plume modelling indicates that the impact from suspended solids is limited.

Dredge plume modelling indicates the depth of sediment deposition outside of the dredge pocket is likely to be <0.001m across all areas (Chapter 9). It is unlikely to have any long-term effects on sandbank habitats. Impacts relevant to the specific PMF habitats found within the SSSI are discussed in section 5.5.18 below.

The habitat could also be affected by pollution events such as fuel or oil spills or materials such as cement entering the water during the operation of the site. Drainage from the site will be subject to regulation by SEPA with associated discharge consents and water treatment requirements installed to meet these standards.

Increased vessel activity at the site once it is in operation may increase the risk of mINNS being spread or introduced.

The impacts are of **negligible to moderate magnitude** and the SSSI considered to be of **negligible to high sensitivity**. The confidence level for the assessment is high.

5.6.1.2 *Kames Bay SSSI*

Construction Impacts

Kames Bay SSSI is located outside of the predicted impacted areas related to the capital dredge plume and, as a result, significant effects from dredging on the designated features of the site are considered to be negligible.

Effects from pollution are also likely to be reduced due to dispersal, however the habitats within the SSSI could still be partially affected by pollution events such as fuel or oil spills. This could result in loss or alteration of composition of species present within the habitat. Given the distance from the development site to the receptor and the nature of the proposed construction works it is considered unlikely that a spill at the site would be of a magnitude that would result in significant migration of contaminants to the receptor.

Due to the lack of construction works in the immediate vicinity of Kames Bay SSSI, the risk of spreading mINNS is considered to be negligible.

The impacts are of **negligible magnitude** and the SSSI are considered to be of **negligible to high sensitivity**. The confidence level for the assessment is high.

Operational Impacts

Kames Bay SSSI is located outside of the predicted impacted areas related to the maintenance dredge plume and, as a result, significant effects from dredging on the designated features of the site are considered to be negligible.

As with the construction impacts, effects from pollutions are also likely to be reduced due to dispersal, however the habitat within the SSSI could still be partially affected by pollution events such as fuel or oil spills. This could result in loss or alteration of composition of species present within the habitat. Drainage from the site will be subject to regulation by SEPA with associated discharge consents and water treatment requirements installed to meet these standards. Given the distance from the development site to the receptor and the nature of the operations it is considered unlikely that a spill at the site would be of a magnitude that would result in significant migration of contaminants to the receptor.

Due to the lack of operational works in the immediate vicinity of Kames Bay SSSI, the risk of spreading mINNS is considered to be negligible.

The impacts are of **negligible magnitude** and the SSSI are considered to be of **negligible to high sensitivity**. The confidence level for the assessment is high.

5.6.1.3 *Ballochmartin Bay*

Construction Impacts

Construction impacts for Ballochmartin Bay SSSI will largely be as described for Kames Bay SSSI in section 5.6.1.2. With the site being a further c.0.5 km further away from the Proposed Development the impacts and resulting effects will be further reduced.

The impacts are of **negligible magnitude** and the SSSI are considered to be of **negligible to high sensitivity**. The confidence level for the assessment is high.

Operational Impacts

Operational impacts for Ballochmartin Bay SSSI will largely be as described for Kames Bay SSSI in section 5.6.1.2. With the site being a further c.0.5 km further away from the Proposed Development the impacts and resulting effects will be further reduced.

The impacts are of **negligible magnitude** and the SSSI are considered to be of **high sensitivity**. The confidence level for the assessment is high.

5.6.2 Terrestrial Habitats

5.6.2.1 *Open Mosaic Habitat on Previously Developed Land*

Construction

OMHPDL are habitats of a high biodiversity value and considered to be a habitat of importance for invertebrate species (especially bees, wasps and beetles), due to often displaying diverse early successional plant assemblages. The habitat is widespread within Scotland in urban and rural brownfield sites but quality of habitat can be variable and not all sites are equal in terms of biodiversity value.

The total area of this habit (c.2.4ha) will be lost permanently as a result of land clearance to facilitate the development. It was assessed as being of moderate condition with the limiting factor being lack of diversity of nectar producing plants, providing foraging resource though the year. Whilst some areas of OMHPDL can be maintained in an early successional state for several years due to poor quality growth substrates, it is considered that without management intervention habitat within the Proposed Development would transition to sea buckthorn scrub, which is already present abundantly.

Although detailed surveys have not been undertaken, OMHPDL was noted as being present across much of the wider landownership area.

The PEA desk studies returned the presence of a variety of SBL moth species within 2km of the site, which could utilise the OMHPDL. However, the location of the Proposed Development on a peninsula which is connected to the mainland via a relatively narrow road, may limit connectivity for invertebrates in the locale. Given the limited connectivity and the presence of similar alternative habitat in the locale, it is considered that the loss of habitat is unlikely to have a negative effect on the conservation status of any invertebrate species.

Overall the impact is considered to be of **major** magnitude with the habitat considered to be of **high** sensitivity. Confidence in the assessment is high.

Operational Impacts

As all the habitat will be removed at the construction phase, there will be no operational phase impacts.

5.6.3 Terrestrial Mammals

5.6.3.1 *Otter*

Construction Impacts

Construction activities including movement of rock armour, piling, earthworks and dredging could result in death or injury of individuals through collision with plant, vehicles or vessels both onshore or within the water. Underwater noise generated by these activities also has potential to cause injury via Permanent Threshold Shift (PTS) or Temporary Threshold Shift (TTS) in hearing. PTS ranges are <10m for all activities but TTS may be experienced up to 800m for piling of dolphins.

The most likely response to construction activities, however, is avoidance. It is anticipated that alterations to normal site activities would result in visual and noise disturbance, causing otter who may utilise the site for commuting and foraging to avoid it. This may reduce the overall foraging area available to otter in the locale, but it is considered that there would be sufficient alternative foraging areas and commuting routes to sustain the population. The risk of injury or death occurring is also greatly reduced if they avoid the area.

Death or injury to otter could also occur as a result of a pollution incident, either through direct contact with a contaminant or indirectly through consumption of affected prey items. Prey populations in the locale could also be temporarily reduced in the short term if they are affected by a pollution incident.

Removal of rock armour and clearance of vegetation will result in loss of potential holts or lay ups, although none were identified during the field survey, future use cannot be ruled out. Areas of rock armour will be retained and so there won't be a complete loss of potential holt features.

All the construction impacts are considered to be temporary and are only expected to affect a relatively small area of habitat available to otter in the locale, which is not considered to be used for breeding. It is not expected that they will affect the favourable conservation status of the otter population in the locale.

The impacts are considered to be of **low** magnitude and the IEF to be of **low sensitivity**. The confidence level for the assessment is high

Operational Impacts

During operation there will be increased activity within the site in terms of vessel movements to and from the Quay as well as onshore activities within the laydown area and access road. Given otter in other locations are known to utilise busy ports it is considered likely that any otter utilising the site at present may become habituated to the additional activities.

Increased artificial lighting could result in the permanent or temporary avoidance of lit areas, reducing available foraging and commuting habitat. It is unlikely that the area affected would be significant in terms of otter territory though.

Additional vehicle movements may increase the risk of a road traffic accident occurring, but individual losses are unlikely to affect the population viability.

Additional vessel movements at the site may increase the risk of a pollution event which could result in death or injury of individuals or their prey. Any impacts arising from such an event would be temporary and not considered likely to impact the conservation status of the otter population in the longer term.

Operational impacts are therefore considered to be of **low** magnitude with otter having **low sensitivity**. The confidence level for the assessment is high.

5.6.4 Ornithology

Construction Impacts

The following are potential construction impacts on wintering waders and waterfowl:

- Increased air-borne noise through construction activities (dredging, piling, plant movement, etc.) leading to disturbance and displacement of foraging and roosting birds;
- Increased visual stimuli through construction activities (personnel and plant movement, etc.) leading to disturbance and displacement of foraging and roosting birds;
- Accidental spills from vessels, plant and on-site storage of fuels and chemicals leading to pollution of habitats and potential harm to birds;
- Increased, artificial lighting leading to disturbance and displacement of foraging and roosting birds;
- Temporary increase in suspended sediment and/or deposition from dredging and construction creating physical disturbance in the marine environment;

Disturbance

The main potential impact during construction will be as a result of disturbance, both physical and noise/vibration, particularly during roosting.

Long term research undertaken in Cardiff Bay (Burton et al 2002 and 2002b) and the Humber Estuary (ERM 1996) indicate that noise from machinery etc on construction and industrial sites can disturb feeding or roosting waders. A study undertaken by Burton and Armitage (2005), found that the feeding population of waders on mudflats immediately adjacent to active construction sites was significantly lower than unaffected mudflats up to a distance of 200-300m. After this distance, numbers of waders appeared to be unaffected. Waders also avoided roosting near active construction sites.

Research by the Environment Agency (EA) for the Humber Estuary Tidal Defences Scheme concluded that a sudden noise in the region of 80dB appears to elicit a flight response in waders up to 250m from the noise source. They also found that levels of approximately 70dB caused flight or anxiety behaviour in some species. This is one of the few published findings on threshold noise levels for wader disturbance. Several studies have shown that waders are generally disturbed by sudden (abrupt) loud noises, known as “startling”, but have the ability to habituate to long term, high noise levels.

Work undertaken by the Institute of Estuarine and Coastal Studies (IECS) on behalf of the Humber Industry Nature Conservation Association (INCA), set out an effect severity scale to use to qualify the magnitude of disturbance impacts on wader and waterfowl species by different construction activities. This can be found in Figure 5-1 below

Personnel and plant on mudflat:	High (and should be restricted at all times)
Third party on mudflat:	High (but difficult to restrict)
Personnel and plant on seaward toe and face:	High to Moderate
Intermittent plant and personnel on crest:	High to Moderate
Third party on bank:	High to Moderate
Irregular piling noise (above 70db):	High to Moderate
Long-term plant and personnel on crest:	Moderate
Regular piling noise (above 70db):	Moderate
Irregular noise (50db - 70db):	Moderate
Regular noise (50db - 70db):	Moderate to Low
Occasional movement of crane:	Moderate to Low
Noise below 50db:	Low
Long-term plant only on crest:	Low
Activity behind flood bank (inland):	Low

Figure 5-1. Disturbance severity scale for waders and waterfowl in relation to coastal construction activities

As described in Technical Appendix 5.7, the main roosting sites for waders at Southannan and Hunterston Sands are the north-east corner of Southannan Sands, Black Rock on the eastern side of Southannan Sands, and Inner Brigund Point on Hunterston Sands. The disturbance buffers do not fall within any of the roost sites at Southannan or Hunterston Sands.

Ground investigation works, including a number of overwater drilling positions, was conducted over a one-month period. The results of the surveys demonstrates that the active ground works taking place at the marine yard have not resulted in significant changes in site use by any species of bird present or caused the abandonment of any traditional roost sites.

Disturbance monitoring during the construction of the test turbine facility on the marine yard in 2013/14 and 2014/15 found that the primary disturbance source was from recreational activities such as dog walking. There was some minor disturbance from construction, predominantly cars along the access road to the yard going above the enforced site speed limit.

Wintering birds at Southannan Sands and Hunterston Sands do show habituation to current activity levels at the wider Hunterston site. This is highly likely to remain the case with increased levels of activity on site.

The main sources of potential construction activity disturbance will be from piling activities and road resurfacing works along the access road. Piling will predominately be vibro-piling as bedrock has been assessed as being at 40m depth. The sound levels from vibro-piling is considered to have a moderate disturbance severity level, however, the works will be undertaken behind a bund that runs along the eastern side of the marine yard. This bund will reduce noise impacts as well asl providing a screen to minimise any potential visible disturbance. The main potential disturbance impact to wintering birds (both feeding and roosting) is during road resurfacing works at certain points along the access road to the HCY, where there are no bunds present that could screen the works. These points include the causeway which runs adjacent to the east side of Hunterston Sands and the road adjacent to the southern end of Southannan Sands.

Pollution

There is the potential for impacts through pollution events resulting in death or injury to individuals either directly or indirectly through consumption of contaminated prey. Prey populations may also be reduced in the short term.

Lighting

Lighting will be installed, both within the construction yard and along the access road into the yard. These will be fitted so that there will be no light spill onto Southannan or Hunterston Sands.

Dredging/suspended sediment

Increased suspended solids within the water column as a result of dredging is possible. Any turbidity arising from an increase in suspended solids associated with construction activities would be temporary and would last no more than an 8 week dredge period. Dredge plume modelling indicates the depth of sediment deposition outside of the dredge pocket is likely to be <0.001m across all areas (include reference to where this is in relevant chapter). This will not have an impact on key feeding areas for wintering waders and waterfowl.

Overall, construction impacts are considered to be temporary, of **low** magnitude with the IEF having **low sensitivity**. Confidence in the assessment is high.

Operational Impacts

The following are potential operational impacts on wintering waders and waterfowl:

- Accidental spills from vessels, plant and on-site storage of fuels and chemicals leading to pollution of habitats and potential harm to a range of bird species including release via drainage;
- Increased visual stimuli through operational activities (personnel and plant movement, etc.) leading to disturbance and displacement of foraging and roosting birds. This is primarily related to vehicle movements along unbunded portions of the access road ;
- Increased, artificial lighting leading to disturbance and displacement of foraging and roosting birds;

As described in the impacts for the construction phase, wintering birds on site have shown habituation to current and historical (higher activity) levels of activity in the wider Hunterston site, including at the marine yard (during the installation and operation of the offshore turbine test facility).

There is the potential for impacts through pollution events resulting in death or injury to individuals either directly or indirectly through consumption of contaminated prey. Prey populations may also be reduced in the short term.

Drainage from the site will be subject to regulation by SEPA with associated discharge consents and water treatment requirements installed to meet these standards.

As described, lighting will be fitted so as not to spill onto Southannan and Hunterston Sands.

Overall, operational impacts are considered to be of **low** magnitude with the IEF having **low sensitivity**. Confidence in the assessment is high.

[35] https://www.marlin.ac.uk/species/detail/1409 (checked 5/5/24)
[36] Vermaat et al The capacity of seagrasses to survive increased turbidity and siltation: the significance of growth form and light use. (1997)
[37] feature-activity-sensitivity-tool.scot/search-feature (checked 24/5/24)

5.6.5 Intertidal Habitats

5.6.5.1 *Seagrass beds*

Construction Impacts

The sea grass beds could be impacted during the construction phase of the works through increased suspended solids within the water column as a result of dredging.

Any increase in turbidity arising from suspended solids from construction activities would be temporary. The dredge plume modelling detailed in Chapter 9 identified the increase in suspended solids occurred over a period of 8 weeks within the 130 day modelling period. This is considered to be reflective of a short term acute change as defined by the Marine Life Information Network (Marlin)[35]. Dredge plume modelling indicates that the area of impact is focussed to the portion of the SSSI north of the HCY where dwarf eelgrass was identified as being present in the intertidal survey.

Intertidal dwarf eelgrass is known to able to take advantage of the high light intensities available at low tide[36] and as such the impact from short term turbidity increases is not expected to have negative effects on the growth or survival of individual plants. .

Seagrasses are not tolerant of smothering and typically bend over with addition of sediment and are buried in a few centimetres of sediment[37]. Dredge plume modelling indicates the depth of sediment deposition outside of the dredge pocket is likely to be <0.001m within the SSSI (Chapter 9). Although deposition depth may vary from those predicted they are well below the levels which would be considered necessary to have negative effects on the growth and survival of individual plants[38].

The habitat could also be affected by pollution events such as fuel or oil spills or materials such as cement entering the water either during the construction phase or operation of the quay. The magnitude would vary depending on the severity of the pollution event and could range from low to high. The impact would be temporary but effects range in duration depending on the type of pollutant and the magnitude of the impact.

Seagrass could be impacted by mINNS, which could be introduced or spread as a result of vessel movements and plant used during construction. Effects will vary depending on the species of mINNS. Japanese wireweed (*Sargassum muticum*) was recorded rarely during the intertidal survey, however it is intolerant of aerial exposure with growth retarded and competitiveness reduced where it is exposed for prolonged periods. It is unlikely therefore that it would have negative effects on the dwarf eelgrass. Other species could be introduced which could over-graze dwarf eelgrass or outcompete it, which could result in a reduced population size and/or fitness and increased fragmentation.

Most impacts during the construction phase will be temporary, although mINNS could be longer term. Overall the impacts are considered to be of **negligible to medium** in magnitude with the receptor being of **negligible to high sensitivity.** The confidence level for the assessment is considered to be high.

Operational Impacts

Operational impacts to dwarf seagrass beds are largely similar to the construction impacts, other than there being a shorter period of turbidity arising suspended solids from dredging (max 2 weeks).

[38] Information available on the MARLIN website. Available at: https://www.marlin.ac.uk/habitats/detail/318/zostera_noltii_beds_in_littoral_muddy_sand (Accessed 15/05/2024)

The impacts are of **negligible to medium** magnitude with the with the receptor being of **negligible to high sensitivity.**. The confidence level for the assessment is medium.

5.6.5.2 *Blue Mussel Beds*

Construction Impacts

The blue mussel beds could be impacted during the construction phase of the works through increased suspended solids within the water column as a result of dredging. Any increase in turbidity arising from suspended solids from construction activities would be temporary . The dredge plume modelling detailed in Chapter 9 identified the increase in suspended solids occurred over a period of 8 weeks within the 130 day modelling period. Dredge plume modelling indicates that the area of impact is focussed to the portion of the SSSI north of the HCY where the mussel beds are present.

An indirect effect of increased turbidity and reduced light penetration may be reduced phytoplankton productivity resulting in a reduction of the food However, blue mussels use a variety of food sources so the effect is likely to be minimal. This species and the biotopes it forms are therefore not sensitive to changes in water clarity that refer to light penetration and are often found in areas with high levels of turbidity[39]. The short term increase in turbidity is therefore considered unlikely to effect the growth or fitness of the population. .

Dredge plume modelling indicates the depth of sediment deposition outside of the dredge pocket is likely to be <0.001m across all areas (Chapter 9). Mytilus edulis has a low sensitivity to smothering as defined by Marlin[40] as all of the species being smothered by sediment to a depth of 5 cm above the substratum for one month. The predicted depth of deposition is well below that which would be likely to affect the growth and survival of individual mussels.

Release of toxic materials during dredging is not considered to be an issue as sediment sampling found no contaminants at levels likely to significantly affect water quality or pose a hazard to marine life.

The habitat could also be affected by pollution events such as fuel or oil spills or materials such as cement entering the water either during the construction phase. The magnitude would vary depending on the severity of the pollution event and could range from low to high. The impact would be temporary but effects range in duration depending on the type of pollutant and the magnitude of the impact. Blue mussels have some tolerance to environmental pollutants as they can close their valves, in effect isolating themselves from the environment for several days, however there may knock on effects of reduced growth and fitness due to reduced feeding.

Mussels could also be impacted through the introduction and/or spread of mINNS. Carpet sea squirt (*Didemnum vexillum*) is of particular concern as it can smoother mussels and is known to be present within the Firth of Clyde and has been recorded at Farlie quay c.3km north of the Proposed Development[41].

Impacts during the construction phase will be temporary and are considered to be of **negligible to moderate magnitude** with the receptor being of **negligible to medium sensitivity.** The confidence level for the assessment is considered to be high.

Operational Impacts

Operational impacts to blue mussel beds are largely similar to the construction impacts, other than there being a shorter period of turbidity arising suspended solids from dredging (max 2 weeks).

Impacts during the operational phase will be temporary and are considered to be of **negligible to moderate magnitude** with the receptor being of **negligible to medium sensitivity.** The confidence level for the assessment is considered to be high.

5.6.6 Marine Mammals

5.6.6.1 *Seals*

Construction Impacts

Construction activities including piling of mooring dolphins and dredging will result in underwater noise which can cause injuries and result in a PTS or TTS in hearing. Prolonged exposure to underwater noise below the PTS and TTS thresholds can reduce individual fitness as it interferes with individuals' ability to communicate with others, feed and navigate in an effect known as masking. Behavioural responses to underwater noise also include avoidance behaviours either by hauling out or moving away from the underwater noise source. These may result in reduced foraging time and/or increased energy expenditure. In extreme cases, exposure to high levels of underwater noise can result in death.

Underwater noise modelling suggests that for impact piling the risk range for PTS for 1 second exposure (instantaneous risk) is 100m for seals, with the TTS risk range of 200m. With no soft start and a fleeing animal, the model shows a PTS risk range of 1200m with a TTS risk range of 6200m. Without mitigation there is therefore a risk of permanent injury or even mortality of individuals, although within a relatively small area of their territory, for the duration of piling, This duration isn't known at present as designs have yet to be finalised but it is assumed it could be up to 6 weeks,

For dredging the PTS and TTS risk ranges are both <10m for 1 second exposure and are <10m and 100m for a fleeing animal with no soft start. It is considered likely that any individual within the area would move away from the sound source fairly quickly once commenced. The effects of this will most likely be temporary displacement of individuals from the waters surrounding the Proposed Development (130 days for dredging and estimated 6 weeks for mooring dolphin installation). It is not considered that the habitat is important for breeding, mating or resting and that there are sufficient alternative foraging areas for them to utilise. Seabed disturbance through dredging can result in temporary increased turbidity as a result of creation of sediment plumes, this has been assessed as part of Chapter 9 of the EIAR. Studies[42] [43] have shown that seals with apparent blindness did not show significant difference in foraging behaviour indicating vision is not essential to survival or ability to forage. The dredge plume is also predicted to cover a relatively small proportion of habitat available to seal and so is unlikely to have any effect on the population.

During construction, there will likely be an increase in vessel movement in and out of the area as the Hunterston Construction Yard principally related to the dredging activities and import of materials to the site. According to the Navigational Risk Assessment presented in Technical Appendix 12.1 it is anticipated that for the 130 day dredge period there will be one or two vessel movements a day. The higher estimate of vessel movements associated with dredging is 258 plus an additional 275 vessel movements associated transporting material for the dry dock infill. There will also be vessel movements to the dredge disposal sites for material not suitable for re-use. The preferred options are Broderick and Birch Point which are c.15km southwest of the site. A further option at Cloch Point is located c.26km to the north. According to the AIS data presented in the Navigational Risk Assessment the total number of vessel movements over a 14 day period in summer and winter, within Hunterston Channel in 2023 was 327.

[39] JNCC Assessing the sensitivity of blue mussels (Mytilus edulis) to pressures associated with human activities (2014)
[40] https://www.marlin.ac.uk/species/detail/1421 (checked 5/5/24)
[41] Information available on the Marine Directorate website: https://marine.gov.scot/sma/assessment/case-study-carpet-sea-squirt (Accessed 15/05/2024)

[42] Journal of Mammalogy Weight and blindness of harbor seal (1970)
[43] Journal of Applied Ecology McConnell B. J., Fedak M. A., Lovell P., Hammond P. S.. Movements and foraging areas of grey seals in the North Sea (1999)

The increase in the number of vessels travelling through to Hunterston, would increase the risk of collision with marine mammals, potentially resulting in death or injury to individuals. Although vessel strikes are generally more associated with larger and less agile marine mammals, and so the numbers affected will likely be minimal. The effects of these impacts will be highly localised and unlikely to affect the conservation status of either species.

Impacts to seals may also arise through pollution events resulting in death or injury to individuals either directly or indirectly through consumption of contaminated prey. Prey populations may also be reduced in the short term.

Due to the temporary nature of the construction impacts, the relatively small area in which individuals could be exposed, and the lack of impacts to known breeding and mating sites, it is not considered that these would have a longer-term effect on the population viability of either seal species within the Southwest Scotland SMU.

Overall the impacts are considered to be of **negligible to low magnitude** with the receptor having a **low sensitivity.** The confidence level for the assessment is high.

Operational Impacts

During operation, maintenance dredging, likely over a two week period will likely be required and will generate impacts associated with underwater noise and increased vessel movements as described above.

Outside of dredging there is will be an increase in vessel movements associated with ongoing port activities. Additional vessel movements past the first project cannot be predicted, however it is anticipated that the initial project would relate to the shipping and storage of offshore windfarm bases. This would likely result in one to two vessel movements a day over a 3 month period in the summer, over a two year period, equating to roughly 180 additional vessel movements a year, which is relatively low against the baseline.

Impacts could also arise via pollution events as described for the construction phase.

Overall impacts relating to the operational phase are considered to be of **negligible to low magnitude** with the receptor having a **low sensitivity.** The confidence level for the assessment is high.

5.6.6.2 *Harbour Porpoise*

Construction Impacts

The main impacts during construction will relate to underwater noise generated from piling of mooring dolphins and dredging. Estimated risk ranges for PTS and TTS for 1 second exposure to impact piling is 300m and 1500m respectively. For dredging the risk ranges are <10m and 100m. Risk ranges for a fleeing animal with no soft start are 5400m and 7600m respectively for impact piling and 100m and 1800m for dredging. Without mitigation underwater noise from impact piling, in particular, could result in permanent injury or at close range, even death of individuals. The area individuals could be affected in covers the whole of the Firth of Clyde from the site across to the Isle of Bute and so could potentially block movement further into the channel for the duration of works.

Impacts from pollution events may also occur, affecting individuals directly or indirectly through ingested prey items. Such an event is likely to be localised and temporary in nature.

Due to the limited area the dredge plume is expected to cover and the use of echolocation by harbour porpoise it is not expected that there will be any impacts arising.

Increased vessel movements could also increase the risk of vessel collision however, harbour porpoises often live in the vicinity of vessel traffic and reactions by porpoises to various types of vessels showed only short-term negative effects from speedboats and large ferries in a study by the Sea Watch Foundation[44]. HWDT[45] indicate that as harbour porpoise are naturally shy of boats, they will for the most part avoid them, and so for most types of marine traffic the risk of collision is minimal. There is more potential for collision with fast-moving engine-powered vessels due to their speed and ability to change direction quickly.

Overall, due to the temporary nature of the impacts, and the high level of mobility and wide ranging nature of harbour porpoise, it is not predicted that any of the impacts would affect the overall conservation status of the population within the West Scotland MU.

The impacts are considered to be of **negligible to moderate magnitude** with the receptor having **low sensitivity.**

Operational Impacts

During the operation of the Proposed Development the main impact is likely to arise via underwater noise generated from maintenance dredging over a 2 week period. The PTS and TTS risk ranges (as described for the construction phase) are relatively small. Over a short period it is not considered this would have any effect on the wider harbour porpoise population within the West Scotland MU.

Impacts could also arise via pollution events as described for the construction phase.

Increased vessel movements (as described in section 5.6.6.1) could result in a small increase in the risk of collision, but it is thought that numbers of individuals affected would likely be minimal and not affect the overall population.

Overall impacts relating to the operational phase are considered to be of **negligible to low magnitude** with the receptor having a **low sensitivity.** The confidence level for the assessment is high.

5.6.6.3 *Minke Whale*

Construction Impacts

As with the previous marine mammals discussed, the main impacts arising from construction are likely to arise from underwater noise generated by impact piling and dredging. For impact piling the PTS and TTS risk ranges for 1 second exposure are 200m and 1200m respectively. For a fleeing animal with no soft start the PTS and TTS risk ranges are 1900 and 7600 respectively. If individuals are actively avowing areas of noise generation, it is possible that impact piling could block movement in and out of the Firth of Clyde if no mitigation is put in place, effectively displacing them temporarily from part of their range.

Risk ranges associated with dredging activity are much smaller with 1 second exposure having PTS and TTS risk ranges of <10m. For a fleeing animal with no soft start the PTS and TTS risk ranges are <10m and 100m, respectively. This may result in avoidance of a small area of suitable habitat for the duration of works but is likely to have no effect on the wider population.

There may be pollution impacts as described for previous marine mammals.

Increased vessel movements could also increase the risk of collision, resulting in injury of death of individuals. The low frequency of noise generated by the vessels may also interfere with their communication. Unlike some other

[44] Sea Watch Foundation: The Harbour Porpoise in UK Waters available at: http://seawatchfoundation.org.uk/wp-content/uploads/2012/07/Harbour_Porpoise.pdf last accessed 13/12/2022

[45] HWDT Harbour Porpoise information available at: https://hwdt.org/harbour-porpoise last accessed 12/12/2022

species, minke whale are less able to adapt their vocalisations to adapt to increased background noise[46]. They are also less able to manoeuvre away from vessels to avoid vessel strike.

Overall the impacts are considered to be of **negligible to moderate magnitude** and sensitivity of the receptor is considered to be of **low sensitivity**. The confidence level for the assessment is high.

Operational Impacts

Operational impacts will include underwater noise generated from maintenance dredging, risk of pollution incidents arising from port activities and risk of vessel collision or interference with communication from increased vessel movements.

Numbers of individuals likely to be affected by these impacts are considered to be minimal and no overall effects on the conservation status of the population are predicted.

Overall impacts relating to the operational phase are considered to be of **negligible to low magnitude** with the receptor having a **low sensitivity.** The confidence level for the assessment is high.

5.6.6.4 *Dolphins*

Construction Impacts

The main impact for dolphins (including killer whales, short-beaked dolphin and bottlenose dolphin) will be the generation of underwater noise. Risk ranges for 1 second exposure for PTS and TTS are <10m and 100m for impact piling. For dredging the PTS and TTS risk ranges are both <10m. For fleeing animals with no soft start, PTS and TTS risk ranges are 100m and 1800m for impact piling and <10 for both, for dredging. Given the small risk ranges for PTS for both activities the risk to individuals is considered to be low and no effects on the wider populations are considered likely.

Impacts from pollution will be as described for previous marine mammals.

Increased vessel movements could increase risk of collisions. Dolphins are generally inquisitive and are observed approaching vessels, however, they are fast, agile and manoeuvrable in water and so collisions with the type of construction vessels likely to be encountered, which tend to be large and slow moving, are highly unlikely.

Impacts during the construction phase are considered to be of **negligible magnitude** with the receptor having **negligible sensitivity**. The confidence level for the assessment is high.

Operational Impacts

As with other marine mammals the operational phase impacts will include underwater noise generated from maintenance dredging, pollution and increased vessel movements.

Numbers of individuals likely to be affected by these impacts are considered to be minimal and no overall effects on the conservation status of the populations are predicted. Impacts during the construction phase are considered to be of **negligible magnitude** with the receptor having **negligible sensitivity**. The confidence level for the assessment is high.

5.6.7 Diadromous Fish

Construction Impacts

Impact to diadromous fish during construction relate to underwater noise from dredging activities, and piling of mooring dolphins, increase in suspended solids in the dredge plume area and impact from pollution as a result of spills.

The effects of underwater noise on fish are less well understood as they are in marine mammals, however there is potential for permanent or temporary injury or in extreme circumstances, death of individuals who are near the initial noise source. Underwater noise modelling predicts PTS and TTS risk ranges from 1 second exposure to noise from impact piling to be <10m and 200m. For animals fleeing with no soft start the risk ranges are 600m and 1900m.

For dredging the PTS and TTS risk ranges from 1 second exposure are <10m for both. For animals fleeing with no soft start the distances are both also <10m. Given the very small risk ranges dredging is not considered likely to have negligible affects to individuals.

Turbidity caused by suspended sediments within the dredge plume could also affect diadromous fish. Salmon will actively avoid turbid waters and so their ability to migrate back to spawning grounds could be affected depending on the time of year the dredging takes place. Similarly post-smolt fish migrating back to sea could also be affected. A study looking at the behaviour of post-smolt salmon during their marine migration in the Clyde region used acoustic tagging to monitor movements[47]. Of the individuals tracked, small numbers took routes to the east of the Isle of Cumbrae, which would put them in the ZoI of the dredging works. The majority appeared to take the route to the west of the island however and it is considered that this would be outside of the predicted ZoI. Assuming spawning migratory routes follow a similar pattern, temporary impacts relating to dredging are unlikely to have an effect of the overall conservation status of the population.

Construction impacts may also arise from pollution events which could cause injury or mortality to individuals.

Whilst exact population estimates for the site are not known, it is considered that for most of the species, the habitat and number of individuals present within the site area small proportion of the total population and that there is suitable alternative habitat within the wider range and that overall conservation status is unlikely to be affected.

The construction impacts are considered to be of a **low magnitude** with the receptor having a **negligible – medium sensitivity**. The confidence in the assessment is intermediate as detailed fish surveys have not been conducted within the area.

Operational Impacts

Impacts to diadromous fish during the operational phase will most likely be as a result of a pollution event, with the effects as described in the section above. As noted previously drainage from the site will be regulated by SEPA with associated discharge parameters and treatment requirements in place.

The operational impacts are considered to be of a **negligible magnitude** with the receptor having a **negligible to medium sensitivity**. The confidence in the assessment is intermediate as detailed fish surveys have not been conducted within the area.

[46] Helble, T.A., Guazza R.A., Martin, C.R., Durbach, Alongi, G.C., Martin, S.W., Boyle, J.K. and Henderson, E.E (2020) Lombard effect: Minke whale boing call source levels vary with natural variations in ocean noise. The Journal of Acoustical Society of America Vol 147 (2).
[47] Available online at: https://onlinelibrary.wiley.com/doi/10.1111/jfb.15200 (Accessed 26/04/2024)

5.6.8 Basking Shark

Construction Impacts

Basking shark may be affected by underwater noise generated during construction. The modelled risk ranges and affects are the same as described for diadromous fish in section 5.6.7.

Increased vessels movements will also impact basking shark. Basking sharks are known to be at risk from vessel strike as they move slowly and are often found near the surface, where they are more likely to come into contact with propellors. They are also known to remain relatively unaware of surface vessels[48].

Seabed disturbance through dredging can result in increased turbidity and creation of sediment plumes, this has been assessed as part of Chapter 9 of the EIAR. Basking sharks have been recorded in turbid waters. A basking shark was tracked in the vicinity of the Amazon River mouth for approximately one month[49]. Basking sharks have been known to penetrate turbid estuaries[50]. The area of increased turbidity will also be small and individuals can move away to alternative habitats if required.

Pollution could also affect individuals, either directly causing injury or mortality, and indirectly through reduced food resource which could impact fitness.

The construction impacts will be temporary, across a small area of possible habitat and so the number of individuals which may be affected it expected to be minimal and have no effect on the wider population.

The impacts will be of **low magnitude** with the receptor being of **negligible to low sensitivity**. Due to limited data on basking shark populations the confidence is intermediate.

Operational Impacts

Operational impacts include increased vessel movements, increasing the risk of collision and pollution incidents with the impacts and associated effects being similar to those described within the construction impact section. The increase in vessel movements will be lower though. The operational impacts are considered to be of **negligible magnitude** with the receptor having a **low sensitivity**. Due to limited data on basking shark populations the confidence is intermediate..

5.6.9 Other Marine Fish

Construction Impacts

The construction impacts for other marine fish will be similar to those described for diadromous fish in terms of underwater noise and pollution.

The impacts of turbidity arising from suspended sediment associated with the dredge plume will depend on the species, with some being more tolerant than others. Even for species considered not to be tolerant, the area impacted would be small in comparison to the alternative habitat available for those species. Whilst exact population estimates within the vicinity of for the Proposed Development are not known, it is considered that for most of the species, the habitat and number of individuals present within the site is a small proportion of the total population and habitat within the wider range and that overall conservation status is unlikely to be affected.

The construction impacts are considered to be of a **low** magnitude with the IEF having a **negligible – medium** sensitivity. The confidence in the assessment is intermediate at present due to a lack of survey data. Impacts to marine fish will be reviewed once further data is gathered during the sub-tidal survey.

Operational Impacts

Impacts to marine fish during the operational phase will most likely be as a result of a pollution event, with the effects as described in the construction impacts section.

The operational impacts are considered to be of a **negligible magnitude** with the receptor having a **negligible to medium sensitivity**. The confidence in the assessment is intermediate.

5.7 Cumulative Impact Assessment

A review of potential cumulative impact was undertaken incorporating consideration of the developments detailed in Table 4-9. These projects incorporate three terrestrial developments and three marine coastal developments as detailed below:

- Fastrig Wing Sail Test Facility Yard - Temporary consent for the establishment of a Fastrig Wing Sail Test Facility Yard to include all temporary buildings (including workshop, storage, office, canteen and WC), access, parking and other required infrastructure.
- Bakkafrost smolt facility - build a recirculating aquaculture system (RAS) smolt facility on industrial land at Hunterston in North Ayrshire as part of a strategy to produce 18 million large post-smolts annually to improve fish health and performance.
- XLCC submarine cable factory - erection of a high voltage cable manufacturing facility, including detailed planning permission for the construction of a 185m high extrusion tower with associated factories, research and testing laboratories, offices with associated stores, transport, access, parking and landscaping with on-site generation and electrical infrastructure and cable delivery system.
- Construction of new slipway for Largs lifeboat.
- Construction of new slipway for Cumbrae ferry.
- Construction of new coastal path in Fairlie.

Given the scale of the marine and coastal developments and the distance from the proposed development site these projects would likely have no cumulative impacts to the Hunterston project in relation impact to biodiversity.

With respect to the terrestrial projects, the Fastrig and Bakkafrost projects are also located on the wider HCY area. The Fastrig project has temporary permission ending within 24 months from 24th January 2023. . Many of the impacts to the terrestrial environment are expected to be similar during the construction and operational phases for these projects. It understood that the Bakkafrost facility may utilise the existing northern quayside at the HCY for vessels as part of their operation, as such the impacts associated with increased vessel movements are expected to be similar in the operational phases of the projects.

For the receptors the magnitude of impacts are considered to be of low – negligible in magnitude and affecting a small area of the relative IEFs range for the projects and so even with cumulative effects, alterations to the overall conservation status of the features is not considered likely

[48] Natural England Research Information Note RIN018 The Basking Shark (Cetorhinus maximus) in West Cornwall: Key sites, anthropogenic threats and their implications for conservation of the species (2008)

[49] Current Biology, Transequatorial Migrations by Basking Sharks in the Western Atlantic Ocean (2009)
[50] Knickle, C., Billingsley, L. & DiVittorio, K.,. Basking Shark (*Cetorhinus maximus*). Florida Museum of Natural History, University of Florida (2017)

5.8 Mitigation and Monitoring

5.8.1 Mitigation

Construction Phase

The following good practice mitigation measures will be implemented in order to avoid and minimise the negative impacts highlighted in section 5.5:

- Prior to works commencing on site (including any site clearance or preparatory works) a Construction Environment Management Plan (CEMP) detailing site specific mitigation and monitoring will be agreed with planning authority and implemented to avoided and reduce negative impacts.
- An Environmental Advisor/Manager will be employed to design and implement on site mitigation strategies as they are required.
- An independent Ecological/Environmental Clerk of Works (ECoW) will be employed to audit and report on adherence to the CEMP as well as any other relevant planning consents, environmental permits, legislation and mitigation.
- A pre-works check for otter will be conducted ahead of works commencing at the site.
- An Ornithological Clerk of Works to undertaken disturbance monitoring during the construction phase, particularly during potential sensitive activities such as piling on the eastern side of the marine yard and access road resurfacing works.
- A Marine Mammal Protection Plan as detailed in Technical Appendix 5.6 will be implemented to reduce the risk of underwater noise causing injury to marine mammals. A basking shark protection plan is also presented in Technical Appendix 5.9. This will involve the use of MMOs. The MMPP also details protocols to be implemented to reduce collision risk. Based on underwater noise modelling of the most severely affected marine mammal group (harbour porpoise) it is recommended that for piling works associated with the mooring dolphins a 60 minute soft start will be employed with a 25db reduction in source level alongside a 500m exclusion zone
- A site specific biosecurity plan has been produced for the proposed development and is provided as Technical Appendix 5.5. This is a working document and will be updated to reflect development in the site operation, use and knowledge with respect to marine non-native invasive species.
- The following good practice guidelines shall be adhered to and incorporated into the CEMP:
    - GGP 5: Works and maintenance in or near water;
    - GPP 6: Working at construction and demolition sites;
    - PPG 7: Safe Storage – The safe operation of refuelling facilities;
    - GPP 21: Pollution and incident response planning; and
    - GPP 22: Dealing with spills.
- All personal on the site should be made aware of the environmental sensitivities of the site (proximity to designated sites) via the site induction and additional task specific toolbox talks as required.
- A speed limit of 15mph to be in place along the access road to the marine yard.
- Any artificial lighting required during construction will be fitted with directional shades and will not illuminate habitats outside of the immediate works area.
- Loss of OMHPDL will be compensated for via the enhancement and creation of habitats described in section 5.7.3. The following will also aid in compensation for lost invertebrate habitat as a result of the lost OMHPDL:
    - Overgrown vegetation and pioneer plant species found in disused developed land within the wider Peel Ports ownership boundary should not be removed whenever possible. This measure can be undertaken temporarily in plots of land and in-between developments.
    - Provision of log piles within areas of grassland, woodland and scrub within the wider ownership boundary.
    - Woodcrete and reed insect blocks or ‘bug hotels’[51] will be installed around Peel Ports, particularly near woodlands and other areas of OMHPDL.
    - Pollinator-friendly flowering mixes will be utilised in areas of grassland in order to provide greater opportunities for a range of pollinators.

Operation Phase

During the operational phase of the development, the following mitigation measures will be undertaken to avoid and minimise the predicted negative impacts:

- The biosecurity plan provided in Technical Appendix 5.5 will be adhered to and reviewed at regular intervals in line with operational needs and available data on mINNS present.
- A speed limit of 15mph to be in place along the access road to the marine yard.
- Vessels will adhere to the protocols presented within the MMPP in Technical Appendix 5.6 in relation to avoiding collision with marine mammals and fish.
- Permanent lighting will be fitted with shades to reduce light spill to habitats within the Southannan Sands SSSI and adjacent habitats used by crepuscular species such as otter.

5.8.2 Licensing

Whilst mitigation will reduce the likelihood of impacts from underwater noise, and lessen the severity of the predicted effects, it won’t be possible to completely avoid some level of disturbance to marine mammals and basking shark which may be present in the area. It is illegal to intentionally or recklessly disturb cetaceans in Scottish waters, which are all EPS. Basking shark are also protected from disturbance under the WCA. A derogation licence to permit disturbance of harbour porpoise, minke whale, killer whale, bottlenose dolphin, short-beaked common dolphin and basking shark, will be required for imperative reasons of overriding public interest.

At present there is no requirement for licensing in relation to otter which are also EPS, however this may need revisited if pre-works checks identify holts or other rest sites.

5.8.3 Biodiversity Enhancements

In order to meet NPF4 Policy 3 the development is required to deliver biodiversity enhancements which increase connectivity to habitats in the wider landscape. In order to demonstrate the developments’ ability to meet these criteria in relation to terrestrial habitats, a Biodiversity Net Gain Assessment was conducted using the DEFRA Biodiversity Statutory Metric Tool. The full methodology and results can be found in Technical Appendix 5.8 Biodiversity Net Gain Assessment. Actions proposed to meet biodiversity gains include:

[51] NHBS Limited. Available to purchase at: https://www.nhbs.com/schwegler-clay-and-reed-insect-nest

- Enhancement of existing other neutral grassland, other lowland acid grassland, woodlands and watercourses.
- Removal of bramble scrub to create other neutral grassland and areas of mixed scrub.
- Removal of other conifer woodland to create further lowland deciduous woodland.
- Planting of individual trees.

Based on the proposed off-site habitat enhancement plans, the off-site habitat area units are predicted to increase by 83.04, providing an overall 3.30 habitat area units increase project wide, or approximately a 4% net gains. Based on the proposed enhancement plans for watercourses and streams, the proposed development is predicted to deliver a net increase of 5.94 river habitat units, or approximately 70% net gains. Due to the loss of and lack of suitable compensation for OMHPDL, the trading rules are not currently satisfied. However, due to the developed and urbanised nature of the habitats present within the wider Peel Ports ownership boundary, it is predicted that OMHPDL may naturally re-occur over the years in disused plots of land. The above habitat enhancement and creation will also help to offset the loss of habitat for invertebrate by increasing the quality and diversity of habitats available locally.

To secure the above actions a Biodiversity Enhancement and Management Plan (BEMP) has been developed for the onshore habitats within the site. This is presented in Technical Appendix 5.10 and includes measurable objectives for habitat creation and management and cover a period of 30 years, with management to be reviewed regularly and informed by monitoring data. It is anticipated that the following additional actions will be included:

- Continued management of the lagoon to the north (currently managed by the RSPB) and the Southannan Sands SSSI should be a priority focus in order to prevent further biodiversity losses and improve biodiversity in the locale. Local authorities and conservation groups should be involved in the active management of these areas. Southannan Sands SSSI, in particular, contains LBAP priority habitats such as intertidal mudflats which should be preserved and managed.
- Provision of artificial hedgehog nests[52] to be installed near bordering woodland habitat, to provide hibernation, resting and breeding opportunities.
- Within the woodlands to be retained and enhanced, as well as the lagoon to the north, a range of bird boxes will be installation to provide permanent nesting opportunities for species present within the locale.
- Within the woodlands to be retained and enhanced, a range of bat boxes to provide permanent roosting opportunities for bats in the locale will also be installed.

5.8.4 Monitoring

Monitoring is required to determine the success of mitigation and enhancement measures and provide data on which to base adaptive management when objectives are not being achieved. It is anticipated that the following monitoring will be required during and/or post-construction:

- Wintering bird surveys to be undertaken during construction and operation of the Proposed Development to establish any changes in site use by wintering waders and wildfowl.
- In order to determine if the aims of the BEMP are being met, monitoring of the habitat should be conducted. This should comprise repeating the condition assessment, including collection of quadrat data and fixed photography to assess changes over time. Monitoring for the BEMP will also include checks on the uptake of bird nest and bat boxes. Insect surveys using the Flower-Insect Timed Count (FIT) methodology[53] employed within the UK Pollinator monitoring scheme, will also be included to monitor changes in pollinator presence within the habitat.
- Surveillance monitoring for the presence of mINNS will be undertaken to ensure early action can be taken in the event of new introductions. Monitoring will be done via eDNA sampling of water, via visual searches or a combination of both.

5.9 Residual Effects

The significance of residual effects considered to be likely, once mitigation has been taken into consideration are summarised in Table 5-9 below.

[52] NHBS Limited. Available to purchase at: https://www.nhbs.com/hedgehog-nest-box

[53] https://ukpoms.org.uk/fit-counts

Table 5-9: Residual effects summary

IEF	Importance of IEF	Type of impact	Nature	Source	Duration	Magnitude	Sensitivity	Significance of effect following mitigation	Confidence	Success of mitigation
Southannan Sands SSSI	International	Construction negative	Habitat degradation	Dredging, pollution, mINNS	Temporary	Negligible to moderate	Negligible to high	Not significant at any geographic level	High	Near certain
Southannan Sands SSSI	International	Operation negative	Habitat degradation	Dredging, pollution, mINNS	Temporary	Negligible to moderate	Negligible to high	Not significant at any geographic level	High	Near certain
Kames Bay SSSI	International	Construction negative	Habitat degradation	Dredging, pollution, mINNS	Temporary	Negligible	Negligible to high	Not significant at any geographic level	High	Near certain
Kames Bay SSSI	International	Operation negative	Habitat degradation	Dredging, pollution, mINNS	Temporary	Negligible	Negligible to high	Not significant at any geographic level	High	Near certain
Ballochmartin Bay SSSI	International	Construction negative	Habitat degradation	Dredging, pollution, mINNS	Temporary	Negligible	Negligible to high	Not significant at any geographic level	High	Near certain
Ballochmartin Bay SSSI	International	Operation negative	Habitat degradation	Dredging, pollution, mINNS	Temporary	Negligible	Negligible to high	Not significant at any geographic level	High	Near certain
Terrestrial Habitat	National (Scotland)	Construction negative	Habitat Loss	Clearance of land within development footprint	Permanent	Major	High	**Significant at the Site level**	High	Near certain
Otter	International	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling, increased vessel and onshore vehicle movements, pollution and lighting	Temporary	Low	Low	Not significant at any geographic level	High	Near certain
Otter	International	Operational negative	Death, injury or disturbance. Habitat Displacement.	Increased vessel and onshore vehicle movements, pollution and lighting	Permanent	Low	Low	Not significant at any geographic level	High	Near certain
Ornithology	National	Construction negative	Habitat Loss, disturbance	piling, vessel movements	Temporary	Low	Low	Not significant at any geographic level	High	Near Certain
Ornithology	National	Operation negative	Disturbance	vessel movements and vehicle movement	Permanent	Low	Low	Not significant at any geographic level	High	Near Certain
Seagrass beds	International/National (Scotland)	Construction negative	Damage	Dredging, pollution, mINNS	Temporary	Negligible to moderate	Negligible to high	Not significant at any geographic level	High	Near Certain
Seagrass beds	International/National (Scotland)	Operation negative	Damage	Dredging, pollution, mINNS	Permanent	Negligible to moderate	Negligible to high	Not significant at any geographic level	High	Near certain
Blue mussel beds	International/National (Scotland)	Construction negative	Damage	Dredging, pollution, mINNS	Temporary	Negligible to moderate	Negligible to medium	Not significant at any geographic level	High	Near Certain

IEF	Importance of IEF	Type of impact	Nature	Source	Duration	Magnitude	Sensitivity	Significance of effect following mitigation	Confidence	Success of mitigation
Blue mussel beds	International/National (Scotland)	Operation negative	Damage	Dredging, pollution, mINNS	Permanent	Negligible to moderate	Negligible to medium	Not significant at any geographic level	High	Near certain
Grey and Harbour Seals	National	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling, pollution, increased vessel movements	Temporary	Negligible to low	Low	Not significant at any geographic level	High	Near certain
Grey and Harbour Seals	National	Operational negative	Death, injury or disturbance. Habitat Displacement.	Increased vessel movements, dredging and pollution	Permanent	Negligible to low	Low	Not significant at any geographic level	High	Near certain
Harbour porpoise	International	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling, pollution, increased vessel movements	Temporary	Negligible to moderate	Low	Not significant at any geographic level	High	Near certain
Harbour porpoise	International	Operational negative	Death, injury or disturbance. Habitat Displacement.	Increased vessel movements, dredging and pollution	Permanent	Negligible to low	Low	Not significant at any geographic level	High	Near certain
Minke whale	International	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling, pollution, increased vessel movements	Temporary	Negligible to moderate	Low	Not significant at any geographic level	Intermediate	Near certain
Minke whale	International	Operational negative	Death, injury or disturbance. Habitat Displacement.	Increased vessel movements, dredging and pollution,	Permanent	Negligible to low	Low	Not significant at any geographic level	Intermediate	Near certain
Dolphins	International	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling, pollution, increased vessel movements	Temporary	Negligible	Negligible	Not significant at any geographic level	Intermediate	Near certain
Dolphins	International	Operational negative	Death, injury or disturbance. Habitat Displacement.	Increased vessel movements, dredging and pollution	Permanent	Negligible	Negligible	Not significant at any geographic level	Intermediate	Near certain
Basking shark	National	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling, pollution, increased vessel movements	Temporary	Low	Negligible to low	Not significant at any geographic level	Intermediate	Near certain
Basking shark	National	Operational negative	Death, injury or disturbance. Habitat Displacement.	Increased vessel movements, dredging and pollution	Permanent	Negligible	Low	Not significant at any geographic level	Intermediate	Near certain
Marine Fish	National	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling, pollution	Temporary	Low	Negligible - medium	Not significant at any geographic level	Intermediate	Near certain
Marine Fish	National	Operational negative	Death, injury or disturbance.	Pollution	Permanent	Negligible	Negligible - medium	Not significant at any geographic level	Intermediate	Near certain

IEF	Importance of IEF	Type of impact	Nature	Source	Duration	Magnitude	Sensitivity	Significance of effect following mitigation	Confidence	Success of mitigation
Diadromous Fish	National	Construction negative	Death, injury or disturbance. Habitat Displacement.	Dredging, piling pollution	Temporary	Low	Low – medium	Not significant at any geographic level	Intermediate	Near certain
Diadromous Fish	National	Operational negative	Death, injury or disturbance.	Dredging, pollution	Permanent	Negligible	Negligible-medium	Not significant at any geographic level	Intermediate	Near certain

5.10 Statement of Significance

Once mitigation has been taken into consideration no significant effects on Important Ecological Features are predicted. Whilst there are some uncertainties or limitations in the assessments and/or mitigation proposed, it is anticipated that monitoring both during construction and through operation will allow for mitigation to be adapted as necessary. There is a possibility of a small number of individual birds, otter, marine mammals or basking sharks experiencing disturbance or being displaced from a small area of their habitat but this is not considered likely to affect the favourable conservation status of populations in a local, national or international context. A derogation licence will be required for disturbance to cetaceans and basking sharks. If successfully implemented, the biodiversity enhancements should provide benefits to the local biodiversity, creating habitats suitable for a variety of floral and faunal terrestrial and intertidal species.

6 SEASCAPE, LANDSCAPE AND VISUAL IMPACT ASSESSMENT

6.1 Introduction

This chapter of the EIAR presents the findings of a seascape, landscape and visual impact assessment (SLVIA) undertaken for the proposed development. Potential significant effects are identified for the construction phase of the proposed development.

The application site has a "Certificate of Lawful Use" which allows for future operation for Class 5 industrial activities. As a consequence, this chapter considers the potential construction phase effects only including assessment of residual effects as a result of the construction works.

The application site is located entirely within the administrative boundary of North Ayrshire Council (NAC), with the baseline layout and application site boundary as shown on Figure 2-1: Site Plan. Detail regarding the application site and the proposed development is located within Chapter 1 (Introduction) and Chapter 2 (Proposed Development).

The location of the proposed development requires the landscape assessment to pay due regard to coastal character. For the purposes of this assessment, the terms 'coastal' and 'coastal character' (as defined and considered within published documents) are considered to fall within the 'seascape' aspect of the SLVIA.

In relation to this, this assessment does not consider 'seascape' as a separate and additional topic but as the coastal counterpart to 'landscape' informed by published coastal character assessments. Herein, references to seascape assessment can therefore be considered as referring to the assessment of effect on coastal character and vice versa.

The SLVIA is supported by the following tables, figures and viewpoint graphics, which are contained in Volume 2 of the EIAR:

Tables

- Table 6-1: Representative Viewpoint Locations for Visual Assessment.
- Table 6-2: Potential Effects.
- Table 6-3: Preliminary Seascape Character Typologies Assessment.
- Table 6-4: Preliminary Landscape Character Typologies Assessment.
- Table 6-5: Preliminary Designated Landscapes Assessment.
- Table 6-6: Settlement Assessment.
- Table 6-7: Transport Route Assessment.
- Table 6-8: Recreational Route Assessment.
- Table 6-9: Recreational Destinations & Visitor Attractions Assessment.

Figures

- Figure 6.1: Seascape and Landscape Character.
- Figure 6.2: Designated Landscapes and Recreational Routes.
- Figure 6.3: Bareground Zone of Theoretical Visibility with Representative Viewpoint Locations.
- Figure 6.4: Bareground Zone of Theoretical Visibility with Seascape and Landscape Character.
- Figure 6.5: Bareground Zone of Theoretical Visibility with Designated Landscapes and Recreational Routes.
- Figures 6.6.1 to 6.6.9: Representative Viewpoints

Agreed Representative Viewpoints

- Viewpoint 1: Hunterston House.
- Viewpoint 2: Ayrshire Coastal Path at Inner Brigurd Point.
- Viewpoint 3: Fairlie Moor Road at Glenside Wood.
- Viewpoint 4: Lion Rock Viewpoint.
- Viewpoint 5: Fairlie Viewpoint.
- Viewpoint 6: Pier Road, Fairlie Picnic Area.
- Viewpoint 7: Portencross Castle and Harbour.
- Viewpoint 8: Glaid Stone Viewpoint.
- Viewpoint 9: West Bay Road, Millport.

Assessment methods

This SLVIA has been prepared with reference to the Third Edition of the Guidelines for Landscape and Visual Impact Assessment (GLVIA3)[54]. The accompanying visual representations have been prepared in accordance with the Visual Representation of Development Proposals – Technical Guidance Note 06/19[55].

The methodology for the SLVIA is described in Section 6.4 (Methodology).

Proposed development

This assessment considers the construction phase works and activities associated with the proposed development. The SLVIA has considered the potential for effects during the construction phase arising from:

- Temporary construction works and activities including temporary buildings.
- Loss of open water and cut-and-fill and other earthworks across the application site (including drainage and infrastructure) to expand the existing quay.
- Material stockpiles, component storage at the quayside and within the laydown areas, construction compounds, fencing, signage, temporary lighting and construction plant and machinery which would include mobile and tower cranes.
- The presence of haulage vehicles, heavy and light goods vehicles, ships, and boats to the application site (including their passage to and from the quay).
- Erection of 3m high security fencing (around both the site and its access road), CCTV and lighting.

For assessment purposes, it was considered important to use a 'realistic worst case' development scenario.

Dry dock

It is anticipated circa 1.3 million m^3 of suitable fill material would be required to infill the dry dock, including surcharge material. Whilst the material would primarily arrive through the reuse of the sites dredge arisings, there is prospect for additional infill material to arrive at the application site by barge.

Quay wall

Creation of a 570m long quay wall with associated infrastructure including mooring dolphins.

It is anticipated that construction works would take up to two years to complete. All of the above activities would temporarily change the perception of the application site. The large scale and generally discordant nature of the

54 Landscape Institute and the Institute of Environmental Management and Assessment (2013) Third Edition of the Guidelines for Landscape and Visual Impact Assessment (GLVIA3)

55 Landscape Institute (2019) Visual Representation of Development Proposals – Technical Guidance Note 06/19

construction works and activities would have the potential to influence the character of the surrounding seascape and landscape environment and visual amenity.

Lighting

The assessment allows for the worst case of up to 40m high mast lighting being introduced to the site during the construction phase. Visualisations contained in Volume 2 show up to 18 such masts. It is likely, however, that lighting proposals may in due course be reduced with the current expectation being a requirement for up to eight 30m high mast lights along the new quayside with 10m high general lighting elsewhere across the site and along the access road at approximately 45 m centres.

6.2 Scoping and Consultation

6.2.1 Scoping report

A scoping report for the proposed development was submitted by EnviroCentre on behalf of the Applicant to NAC and Scottish Government's Marine Directorate (SGMD) in October 2023.

Chapter 6 (Seascape/Landscape and Visual) of the scoping report considered potential landscape and visual effects. The chapter considered:

- The seascape and landscape character of the application site and surrounding area;
- The coverage of any designated landscapes across the application site and surrounding area;
- Important views and viewpoints towards the application site from the surrounding area;
- The potential for significant seascape, landscape and visual effects during the construction phase; and
- Recommendations for mitigating any potentially significant adverse effects found.

The chapter proposed to scope in the seascape, landscape and visual topic into the EIAR.

A bareground Zone of Theoretical Visibility (ZTV) for the proposed development was included as was a list of candidate representative viewpoint locations. The chapter also focused on determining a suitable and proportionate extent of study area, whilst seeking clarification on the assessment methodology and criteria to be adopted.

The chapter concluded with the following list of questions to be answered by consultees:

- Q1: Do you have any comments on the overall methodologies proposed to assess potential construction stage effects on coastal, landscape, and visual receptors?
- Q2: Do you agree with the proposed 5km study area?
- Q3: Do you agree with the identified coastal, landscape, and visual receptors to be considered within the assessment of construction stage effects (i.e., where it is expected that significant effects may occur)?
- Q4: Do you agree with the identified viewpoint locations to represent potential change during the construction stage as experienced from the identified coastal and landscape character areas, and visual receptors?
- Q5: Do you agree that a Residential Visual Amenity Assessment (RVAA) does not need to accompany the SLVIA?
- Q6: Are there any other relevant consultees who should be consulted with respect to the SLVIA?

6.2.2 Scoping opinions

Formal scoping opinions were received from:

- North Ayrshire Council (December 2023).
- NatureScot (November 2023).
- Scottish Government's Marine Directorate (October 2023).

Chapter relevant comments from the scoping opinion responses received are detailed below.

North Ayrshire Council

NAC agreed that a SLVIA should be scoped in to the EIAR.

NAC also agreed in principle with the scope and extent of SLVIA to be submitted as part of the planning application, providing the following comments:

"The proposed Seascape/Landscape Visual Impact Assessment is agreed. The context of the site in an industrial landscape is noted as are the permitted developments which would add to that landscape context. The cumulative impacts should be considered. Given the nature of the works, assessment of receptors in a 5km radius is agreed.

In addition to the viewpoints in Table 8.1 of the Scoping Report dated Sept 2023, a viewpoint from Millport is requested. A viewpoint from somewhere such as outside No. 27 West Bay Road is requested. This would incorporate the likely most visible viewpoint from the Conservation Area and adjacent to a recreation ground at a distance of approx. 3km from the site."

In response, a viewpoint from Millport has been included in this SLVIA (representative viewpoint 9).

NatureScot

NatureScot included a request for consideration in the EIA of:

"Landscape and visual impacts arising from the enabling development, including cumulative impacts with other developments/ proposals in the wider area".

Specifically on landscape and visual matters, NatureScot stated:

"Landscape and visual impacts of the proposed development are a key consideration, including cumulative impacts with other developments in the Hunterston Strategic Development Area.

This case does not meet our threshold for providing project specific scoping advice, please see the advice on landscape and visual impact assessment in our pre-application guidance and other guidance on our website[56]."

A simple assessment of potential cumulative matters during the construction phase of the proposed development has been included in this SLVIA.

In assessing the potential effects of the proposed development, NatureScot advised on referring to their pre-application guidance for onshore wind farms[57], as they considered the principles similar.

56 NatureScot (January 2023) Landscape tools and techniques. Available at: https://www.nature.scot/professional-advice/landscape/landscape-tools-and-techniques (Accessed: December 2023)

57 NatureScot (September 2023) NatureScot pre-application guidance for onshore wind farms. Available at: https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms (Accessed: December 2023)

NatureScot also provided the following general comments, which have been included below, owing to their relevance to the SLVIA:

"We note that there are various options currently being evaluated for the HCY and therefore the EIAR must include sufficient information relating to the maximum envelope for these works and to include an assessment of the worst case scenarios. We further note that there are several consented and proposed schemes adjacent to this proposal, e.g. Bakkafrost aquaculture facility, Fastrig demonstration project and the XLCC submarine cable factory, which make the assessment of cumulative impacts a significant challenge.

We welcome that this proposal will be informed by the approved Hunterston Port and Resource Campus-(PARC) Development Framework and the emerging PARC Landscape Specification Document as well as the recently completed Natural Capital Account for the Hunterston Strategic Development Area. We are ready to work with the applicant and other stakeholders to maximise the opportunities provided at this nationally important site for commerce and the environment."

Scottish Government's Marine Directorate

No specific SLVIA issues were raised by the Scottish Government's Marine Directorate (SGMD). Additionally, none of the general comments raised in the scoping opinion response considered to meaningfully influence the scope of SLVIA to be produced.

6.2.3 Further consultations during the assessment

Following receipt of the scoping opinion responses, further consultations were undertaken during the early stages of the assessment with both NAC and NatureScot. These post-scoping consultations with NAC and NatureScot focused on the following topics:

- Baseline study area survey visit.
- The selection of candidate representative viewpoints for the visual assessment.
- Planning application stage and consented developments to be considered in the cumulative assessment.

6.2.4 Potential effects scoped into the assessment

Following consultations with the various consultees, the following receptors are scoped into the assessment:

- Coastal Character Areas (CCAs) and Landscape Character Types (LCTs) within a 5km radius of the proposed development where there may be potential for significant landscape effects;
- Designated landscapes within a 5km radius of the proposed development where there may be potential for the proposed development to affect special qualities;
- Residential receptors within a 5km radius of the proposed development where there may be potential for significant visual effects; and
- Recreational receptors within a 5km radius of the proposed development where there may be potential for significant visual effects e.g., those at recognised recreational destination and visitor attractions; those at popular hills tops; and those on recognised walking/cycling routes.

Potential construction stage effects on the non-Inventory-listed Hunterston Estate designed landscape have also been considered.

6.2.5 Matters scoped out

Based on the scope agreed with the various statutory consultees, the following seascape, landscape character and visual receptors have been scoped out of this assessment:

- Coastal Character Areas (CCAs) and LCTs with limited theoretical visibility and/or those located beyond 5km from the proposed development, where the potential for significant effects on seascape and landscape character is limited;
- Designated landscapes with limited theoretical visibility and/or those located beyond 5km from the proposed development, where the potential for significant effects on their special qualities is limited;
- Transport and recreational routes as well as settlements with limited theoretical visibility and/or those located beyond 5km from the proposed development, where the potential for significant visual and sequential effects is limited;
- Recreational receptors located beyond 5km from the proposed development where the potential for significant visual and sequential effects is limited; and
- Seascape, landscape and visual receptors in the cumulative assessment where the potential for significant cumulative effects is limited.
- Although lighting forms part of the construction phase of the proposed development, a detailed assessment of night time effects was scoped out of the assessment due to the context of the site in an industrial landscape. No requests for night-time site assessment visits, night-time viewpoint photography, separate assessment of the significance of night-time impacts, or night-time photomontage visualisations were received from consultees.

6.3 Policy, Legislation and Guidance

6.3.1 National policy

National Planning Framework 4

The National Planning Framework 4[58] (NPF4) was adopted in February 2023, replacing the previous National Planning Framework 3 (NPF3) and forming part of the Development Plan. The Scottish Planning Policy (SPP) (2014) was amalgamated with NPF4 in the adoption of the new framework.

Hunterston Construction Yard is listed as a Strategic Asset within NPF4. The following sustainable development goals (SDG) are considered to be of relevance to this SLVIA:

- 1: No Poverty.
- 2: Zero Hunger.
- 8: Decent Work and Economic Growth.
- 9: Industry, Innovation and Infrastructure.
- 11: Sustainable Cities and Communities.
- 14: Life Below Water.

Policies considered relevant from a seascape, landscape and visual amenity perspective are outlined below:

Policy 4: Natural places. The intent of this policy is *"To protect, restore and enhance natural assets making best use of nature-based solutions."*

58 The Scottish Government (February 2023) National Planning Framework 4

Policy 4 provides the following detail:

"a) Development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported.

b) Development proposals that are likely to have a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection Areas) and are not directly connected with or necessary to their conservation management are required to be subject to an "appropriate assessment" of the implications for the conservation objectives.

c) Development proposals that will affect a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve will only be supported where:

i. The objectives of designation and the overall integrity of the areas will not be compromised; or

ii. Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.

All Ramsar sites are also European sites and/or Sites of Special Scientific Interest and are extended protection under the relevant statutory regimes.

d) Development proposals that affect a site designated as a local nature conservation site or landscape area in the LDP will only be supported where:

i. Development will not have significant adverse effects on the integrity of the area or the qualities for which it has been identified; or

ii. Any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits of at least local importance.

e) The precautionary principle will be applied in accordance with relevant legislation and Scottish Government guidance.

f) Development proposals that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present on a site or may be affected by a proposed development, steps must be taken to establish its presence.

The level of protection required by legislation must be factored into the planning and design of development, and potential impacts must be fully considered prior to the determination of any application.

g) Development proposals in areas identified as wild land in the Nature Scot Wild Land Areas map will only be supported where the proposal:

i. will support meeting renewable energy targets; or,

ii. is for small scale development directly linked to a rural business or croft, or is required to support a fragile community in a rural area.

All such proposals must be accompanied by a wild land impact assessment which sets out how design, siting, or other mitigation measures have been and will be used to minimise significant impacts on the qualities of the wild land, as well as any management and monitoring arrangements where appropriate.

Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration."

NatureScot is responsible for identifying National Scenic Areas (herein NSAs). These are illustrated on a map which can be accessed at:

https://www.webarchive.org.uk/wayback/archive/20210720105124mp_/https://www.nature.scot/sites/default/files/2019-10/Special%20qualities%20NSAs%20-%20SNH%20report%20374%20-%20Map%20of%20all%20NSAs.pdf

NatureScot have provided descriptions for each of the forty (40) NSAs identified.

NatureScot is also responsible for identifying areas of Wild Land (WLAs). These are illustrated on a map which can be accessed at:

https://www.nature.scot/doc/wild-land-areas-map-and-descriptions-2014

NatureScot have provided descriptions for each of the forty-two (42) WLAs identified.

According to our research, there are no NSAs or WLAs in the study area.

***Policy 7: Historic assets and places*.** The intent of this policy is *"To protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places".*

Policy 7 provides the following detail:

"a) Development proposals with a potentially significant impact on historic assets or places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place.

The assessment should identify the likely visual or physical impact of any proposals for change, including cumulative effects and provide a sound basis for managing the impacts of change.

Proposals should also be informed by national policy and guidance on managing change in the historic environment, and information held within Historic Environment Records.

b) Development proposals for the demolition of listed buildings will not be supported unless it has been demonstrated that there are exceptional circumstances and that all reasonable efforts have been made to retain, reuse and/or adapt the listed building.

Considerations include whether the:

i. building is no longer of special interest;

ii. building is incapable of physical repair and re-use as verified through a detailed structural condition survey report;

iii. repair of the building is not economically viable and there has been adequate marketing for existing and/or new uses at a price reflecting its location and condition for a reasonable period to attract interest from potential restoring purchasers; or

iv. demolition of the building is essential to delivering significant benefits to economic growth or the wider community.

c) Development proposals for the reuse, alteration or extension of a listed building will only be supported where they will preserve its character, special architectural or historic interest and setting. Development proposals affecting the setting of a listed building should preserve its character, and its special architectural or historic interest.

d) Development proposals in or affecting conservation areas will only be supported where the character and appearance of the conservation area and its setting is preserved or enhanced. Relevant considerations include the:

i. architectural and historic character of the area;

ii. existing density, built form and layout; and

iii. context and siting, quality of design and suitable materials.

e) Development proposals in conservation areas will ensure that existing natural and built features which contribute to the character of the conservation area and its setting, including structures, boundary walls, railings, trees and hedges, are retained.

f) Demolition of buildings in a conservation area which make a positive contribution to its character will only be supported where it has been demonstrated that:

i. reasonable efforts have been made to retain, repair and reuse the building;

ii. the building is of little townscape value;

iii. the structural condition of the building prevents its retention at a reasonable cost; or

iv. the form or location of the building makes its reuse extremely difficult.

g) Where demolition within a conservation area is to be followed by redevelopment, consent to demolish will only be supported when an acceptable design, layout and materials are being used for the replacement development.

h) Development proposals affecting scheduled monuments will only be supported where:

i. direct impacts on the scheduled monument are avoided;

ii. significant adverse impacts on the integrity of the setting of a scheduled monument are avoided; or

iii. exceptional circumstances have been demonstrated to justify the impact on a scheduled monument and its setting and impacts on the monument or its setting have been minimised.

i) Development proposals affecting nationally important Gardens and Designed Landscapes will be supported where they protect, preserve or enhance their cultural significance, character and integrity and where proposals will not significantly impact on important views to, from and within the site, or its setting.

j) Development proposals affecting nationally important Historic Battlefields will only be supported where they protect and, where appropriate, enhance their cultural significance, key landscape characteristics, physical remains and special qualities.

k) Development proposals at the coast edge or that extend offshore will only be supported where proposals do not significantly hinder the preservation objectives of Historic Marine Protected Areas.

l) Development proposals affecting a World Heritage Site or its setting will only be supported where their Outstanding Universal Value is protected and preserved.

m)Development proposals which sensitively repair, enhance and bring historic buildings, as identified as being at risk locally or on the national Buildings at Risk Register, back into beneficial use will be supported.

n) Enabling development for historic environment assets or places that would otherwise be unacceptable in planning terms, will only be supported when it has been demonstrated that the enabling development proposed is:

i. essential to secure the future of an historic environment asset or place which is at risk of serious deterioration or loss; and

ii. the minimum necessary to secure the restoration, adaptation and long-term future of the historic environment asset or place.

The beneficial outcomes for the historic environment asset or place should be secured early in the phasing of the development, and will be ensured through the use of conditions and/or legal agreements.

o) Non-designated historic environment assets, places and their setting should be protected and preserved in situ wherever feasible.

Where there is potential for non-designated buried archaeological remains to exist below a site, developers will provide an evaluation of the archaeological resource at an early stage so that planning authorities can assess impacts. Historic buildings may also have archaeological significance which is not understood and may require assessment.

Where impacts cannot be avoided they should be minimised. Where it has been demonstrated that avoidance or retention is not possible, excavation, recording, analysis, archiving, publication and activities to provide public benefit may be required through the use of conditions or legal/planning obligations.

When new archaeological discoveries are made during the course of development works, they must be reported to the planning authority to enable agreement on appropriate inspection, recording and mitigation measures."

Historic Environment Scotland (HES) is responsible for designating Gardens and Designed Landscapes (GDLs). These are contained in an Inventory which can be accessed at:

https://www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/gardens-and-designed-landscapes/

HES have provided descriptions listing the special qualities which merit the designation of each GDL.

According to our research, the only GDL in the study area is Kelburn Castle (ref: GDL00233).

Policy 11: Energy. The intent of this policy is *"To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage (CCUS)."*

Policy 11 provides the following detail:

"a) Development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported. These include:

i. wind farms including repowering, extending, expanding and extending the life of existing wind farms;

ii. enabling works, such as grid transmission and distribution infrastructure;

iii. energy storage, such as battery storage and pumped storage hydro;

iv. small scale renewable energy generation technology;

v. solar arrays;

vi. proposals associated with negative emissions technologies and carbon capture; and

vii. proposals including co-location of these technologies.

b) Development proposals for wind farms in National Parks and National Scenic Areas will not be supported.

c) Development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.

d) Development proposals that impact on international or national designations will be assessed in relation to Policy 4.

e) In addition, project design and mitigation will demonstrate how the following impacts are addressed:

i. impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;

ii. significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/r appropriate design mitigation has been applied, they will generally be considered to be acceptable;

iii. public access, including impact on long distance walking and cycling routes and scenic routes;

iv. impacts on aviation and defence interests including seismological recording;

v. impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;

vi. impacts on road traffic and on adjacent trunk roads, including during construction;

vii. impacts on historic environment;

viii. effects on hydrology, the water environment and flood risk;

ix. biodiversity including impacts on birds;

x. impacts on trees, woods and forests;

xi. proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;

xii. the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and

xiii. cumulative impacts.

In considering these impacts, significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets.

Grid capacity should not constrain renewable energy development. It is for developers to agree connections to the grid with the relevant network operator. In the case of proposals for grid infrastructure, consideration should be given to underground connections where possible.

f) Consents for development proposals may be time-limited. Areas identified for wind farms are, however, expected to be suitable for use in perpetuity.

Scottish Planning Policy

Scottish Planning Policy[59] (SPP) is the Scottish Government's statement on land use planning policy. It provides the policy statement on how nationally important land use planning matters should be addressed across the country. The following components of SPP relate to the potential landscape and visual effects of the proposed development. In relation to Landscape and Natural Heritage, under paragraph 194, the Scottish Government recognises that landscape is subject to change and aims to *"facilitate positive change while maintaining and enhancing distinctive landscape character"*.

Under paragraph 202, the Scottish Government also recognises that different landscapes will have different capacities to accommodate new development, and therefore *"the siting and design of development should take account of local landscape character"*.

The following paragraphs are also considered to be of relevance:

Paragraph 41: Distinctive. This paragraph encourages *"development that complements local features, for example landscapes, topography, ecology, skylines, spaces and scales, street and building forms, and materials to create places with a sense of identity"*.

Paragraph 45: Resource Efficient. This paragraph encourages *"development that re-uses or shares existing resources, maximises efficiency of the use of resources through natural or technological means and prevents future resource depletion, for example by mitigating and adapting to climate change. This can mean denser development that shares infrastructure and amenity with adjacent sites. It could include siting development to take shelter from the prevailing wind; or orientating it to maximise solar gain. It could also include ensuring development can withstand more extreme weather, including prolonged wet or dry periods, by working with natural environmental processes such as using landscaping and natural shading to cool spaces in built areas during hotter periods and using sustainable drainage systems to conserve and enhance natural features whilst reducing the risk of flooding. It can include using durable materials for building and landscaping as well as low carbon technologies that manage heat and waste efficiently."*

Paragraph 56: Development Management. This paragraph states that *"Design is a material consideration in determining planning applications. Planning permission may be refused and the refusal defended at appeal or local review solely on design grounds."*

Paragraph 77: Delivery. This paragraph states that *"In remote and fragile areas and island areas outwith defined small towns, the emphasis should be on maintaining and growing communities by encouraging development that provides suitable sustainable economic activity, whilst preserving important environmental assets such as landscape and wildlife habitats that underpin continuing tourism visits and quality of place"*.

Paragraph 194: Policy Principles. This paragraph states that *"The planning system should:*

- *"facilitate positive change while maintaining and enhancing distinctive landscape character;*
- *conserve and enhance protected sites and species, taking account of the need to maintain healthy ecosystems and work with the natural processes which provide important services to communities;*
- *promote protection and improvement of the water environment, including rivers, lochs, estuaries, wetlands, coastal waters and groundwater, in a sustainable and co-ordinated way;*
- *seek to protect soils from damage such as erosion or compaction;*

59 Scottish Government (2014) Scottish Planning Policy

- *protect and enhance ancient semi-natural woodland as an important and irreplaceable resource, together with other native or long-established woods, hedgerows and individual trees with high nature conservation or landscape value;*
- *seek benefits for biodiversity from new development where possible, including the restoration of degraded habitats and the avoidance of further fragmentation or isolation of habitats; and*
- *support opportunities for enjoying and learning about the natural environment."*

Paragraph 202: Development Management. This paragraph states that *"The siting and design of development should take account of local landscape character. Development management decisions should take account of potential effects on landscapes and the natural and water environment, including cumulative effects. Developers should seek to minimise adverse impacts through careful planning and design, considering the services that the natural environment is providing and maximising the potential for enhancement."*

Paragraph 203: Development Management. This paragraph states that *"Planning permission should be refused where the nature or scale of proposed development would have an unacceptable impact on the natural environment. Direct or indirect effects on statutorily protected sites will be an important consideration, but designation does not impose an automatic prohibition on development."*

Scotland's National Marine Plan

Scotland's National Marine Plan[60] was produced to provide guidance on the future management of Scotland's onshore and offshore waters.

The following general policies are considered relevant from a seascape, landscape and visual amenity perspective:

GEN 6 Historic environment**:** This policy states that *"Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance."*

Paragraphs 4.20 – 4.25 provide further detail:

"4.20 The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged. In addition to its cultural value, the historic environment can be a powerful driver for economic growth, attracting investment and tourism and sustaining enjoyable and sustainable places in which to live and work.

4.21 Those elements – buildings, monuments, sites or landscapes – that have been identified as holding a degree of significance meriting consideration are called 'heritage' assets. Some heritage assets around our coast have a level of interest that has justified statutory designation (Map 3). There are also many undesignated heritage assets which also contribute positively to the cultural and social dimension of our coasts and seas and to local economies through recreation and tourism.

4.22 Marine planning should help to ensure that future marine activities and developments can be carried out in a way that respects the marine historic environment and the setting of important coastal heritage assets. It can also help to increase the social and economic contribution of the heritage assets, for example by encouraging opportunities for public access.

4.23 To achieve this, marine planners and decision makers should consider implications and opportunities for the historic environment taking into account the potential impacts of development and use on:

- *Designated heritage assets – representing sites of national or international significance for which statutory requirements apply. Designated assets should be protected in situ within an appropriate setting. Substantial loss or harm to designated assets should be exceptional and should only be permitted if this is necessary to deliver social, economic or environmental benefits that outweigh the harm or loss.*
- *Undesignated heritage assets – those that meet designation criteria or make a positive contribution should also be protected in situ, wherever possible, and consideration given to the potential for new discoveries of historic or archaeological interest to arise.*

4.24 Proposals for development and use that may affect the historic environment should provide information on the significance of known heritage assets and the potential for new discoveries to arise. They should demonstrate how any adverse impacts will be avoided, or, if not possible, minimised and mitigated. Where it is not possible to minimise or mitigate impacts, the benefits of proceeding with the proposal should be clearly set out.

4.25 Where the case for substantial change to a heritage asset is accepted, marine decision-making authorities should require applicants to undertake suitable mitigating actions to record and advance understanding of the significance of the heritage asset before it is lost, in a manner proportionate to that significance. The resulting evidence should be made publicly accessible and copies of reports archived with the Royal Commission on the Ancient and Historical Monuments of Scotland and the adjacent Local Authority archaeology service."

GEN 7 Landscape/seascape**:** This policy states that *"Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account."*

Paragraphs 4.26 – 4.31 provide further detail:

"4.26 Landscape and seascape are important elements of people's enjoyment of the coastal and marine environment. They are also important as the setting for coastal communities, contributing to sense of place, economic livelihoods and quality of life.

Scotland's varied coastal landscapes are internationally renowned and support a valuable recreation and tourism sector.

4.27 The Scottish Government is committed to implementing the principles of the European Landscape Convention, which includes seascapes and applies an 'all landscapes approach' that addresses developed, altered and cultural landscapes as well as more natural scenic areas. This does not preclude development or change, but recommends that it is carried out appropriately for the area's landscape character and visual amenity.

4.28 Development and use that affect National Scenic Areas, National Parks and World Heritage Sites should only be permitted where:

- *It will not adversely affect the integrity of the area or its special qualities for which it has been designated; or*
- *Any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance.*

4.29 In making these judgements, planners and decision makers should have regard to the qualities of the location in question, including any designation. More generally, the siting and design of a development should take account of the local landscape/seascape character and quality. Potential effects on landscapes and seascapes, including cumulative effects should be considered and developers should seek to minimise adverse impacts through careful planning and design, considering the services which the natural environment is providing and maximising the potential for enhancement.

4.30 Where development has the potential to impact on wild land, locally designated areas, largely undeveloped coast, areas subject to significant constraints or largely unspoiled areas of coast, Scottish Planning Policy should be considered when planning for, and taking decisions, which may impact on such areas.

60 The Scottish Government (2015) Scotland's National Marine Plan

4.31 Existing Scottish Natural Heritage (SNH) guidance on the principles of good siting and design and examples of emerging good practice should be followed. SNH Landscape Character Assessments and forthcoming SNH guidance on undertaking Coastal Character Assessment also provide useful tools in considering impacts on landscape."

Paragraphs 13.15 – 13.18, which are focussed on renewable energy, state:

"13.15 Renewable energy: The National Renewables Infrastructure Plan (N-RIP) identifies a spatial framework of port and harbour sites, based on best fit locations against offshore renewable industry needs, i.e. construction/installation, manufacturing and inspection, repair and maintenance. The requirements for locations are:

- *The proximity of the port to the renewables site.*
- *Sites that have, or have the potential for, integrated manufacturing or space for distributed manufacturing.*
- *Appropriate water depth.*
- *A skilled workforce.*
- *Already have investment plans or agreements of plans.*

13.16 N-RIP sets out investment and infrastructure needs for offshore renewable energy, including quayside infrastructure, land remediation/reclamation and change of quayside water depth. An associated £70 million National Renewables Infrastructure Fund, announced in November 2010, will assist with development in the areas covered by Scottish Enterprise. Similar support is being offered to ports in the Highlands and Islands Enterprise (HIE) area. N-RIP 3, currently under development, will consider port requirements to support wave and tidal energy and development.

13.17 It is important to note that opportunities for renewables development and activity are not restricted to the ports identified in N-RIP (Map 10). Indeed, many other ports are currently engaged in discussions with renewables companies around how they can help meet the needs of the industry, including future operations and maintenance activity.

13.18 To inform planning in this area, a survey of shipping density, vessel types and drafts, course and destination has been undertaken in Pentland Firth and Orkney Waters.

Further studies will be undertaken if required."

6.3.2 Regional planning policy

Regional Marine Plan for Clyde Marine Region

Statutory Regional Marine Plans are being prepared for all Scottish waters. The emerging Regional Marine Plan for Clyde Marine Region[61] is the outcome of a pilot process for setting up planning policy framework for future statutory Regional Marine Plans.

The following objectives and policies are considered relevant from a seascape, landscape and visual amenity perspective:

Objective SCAPE 1. This objective states **"***Nationally and locally important landscape/seascape character of the Clyde Marine Region is protected, and where appropriate enhanced, at both a wider and a local level to contribute to the quality of life and wellbeing of local communities and visitors."*

Objective SCAPE 1 is supported by Policy SCAPE 1 and Policy SCAPE 2, which state:

Policy SCAPE 1

"The siting and design of any proposed development(s) and/or activities should demonstrate:

- *how the proposal takes into account visual impact and existing character, experience and quality of landscape and seascape. This includes developed, altered and cultural landscapes as well as natural areas, and*
- *a high standard of design, in terms of siting, scale, colour, materials and form to ensure the development or coastal use change will be accommodated within particular landscape and seascape types.*

Reference should be made to the Seascape/Landscape Assessment of the Firth of Clyde (see Map SCAPE 3) and the relevant planning authority Landscape Assessments."

Policy SCAPE 2

"Development(s) and/or activities that affect National Scenic Areas, National Parks, Wild Land Areas or Local Landscape Areas (see Map SCAPE 1 and Map SCAPE 2) will only be supported where:

- *it will not adversely affect the integrity of the area or its special qualities for which it has been designated, including nationally or locally important landscapes/seascapes, or*
- *any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance (or local importance for Local Landscape Areas).*

Development(s) and use(s) that affect National Scenic Area or a National Park should take account of the Special Qualities of the relevant designation; a Design Statement may be required to support a development/use that affects a Natural Scenic Area or National Park.

Applicants are required to demonstrate that potential effects on a Wild Land Area, including cumulative effects, have been taken into consideration or mitigated when applying for planning consent, works licences and marine licences. A Wild Land Assessment may be required if the proposal has the potential to significantly affect the qualities of a Wild Land Area."

6.3.3 Local planning policy

The application site is located within the administrative boundary of NAC and is therefore subject to planning policies contained in the Adopted Local Development Plan (LDP)[62].

Relatable content associated with the development plan includes:

- Statutory and non-statutory supplementary guidance;
- Other guidance and monitoring; and
- Supporting planning guidance.

Adopted Local Development Plan

The LDP, which was adopted in April 2019, contains the land use planning polices which NAC use for determining applications and NAC development proposals for town, villages, and rural settlements within the local authority area.

The principal policy is considered to be Strategic Policy 3: Strategic Development Areas, as Hunterston has been identified as a Strategic Development Area.

6161 Clyde Marine Planning Partnership (2019) Clyde Regional Marine Plan Pre-consultation Draft

62 North Ayrshire Council (2019) Adopted Local Development Plan

Other LDP planning policies of interest from a seascape, landscape and visual perspective include:

Policy 11: Historic Gardens and Designed Landscapes**.** This policy states that NAC *"will promote the development of Landscape Management Plans that seek to prioritise the preservation and enhancement of our Historic Gardens and Designed Landscapes by supporting applications for the Landscape Management Plan Grants Scheme (or similar) to ensure that these important assets are managed appropriately.*

We will only support development proposals affecting Historic Gardens and Designed Landscapes and their setting when they are in line with Landscape Management Plans or otherwise preserves and enhances their importance. Development proposals should also seek to preserve important vistas to, from or within the Historic Garden and Designed Landscape."

Policy 15: Landscape and Seascape. This policy states that NAC **"***will support development that protects and/or enhances our landscape/seascape character, avoiding unacceptable adverse impacts on our designated and non-designated landscape areas and features. In particular, we will consider the following:*

a) National Scenic Areas

Development that affects the North Arran National Scenic Area including the need to protect existing sport and recreation interests, will only be supported where:

i) the objectives of the designation and the overall integrity of the area will not be compromised; or

ii) any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.

b) Special Landscape Areas

We will only support development which affects Special Landscape Areas where it would not have an unacceptable impact on their special character, qualities and setting.

c) Wild Land

We will only support development within Wild Land areas where any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.

d) Local Landscape Features

Where appropriate, development should take into consideration its individual and cumulative impacts on landscape features, including:

i) patterns of woodlands, fields, hedgerows and trees;

ii) lochs, ponds, watercourses, wetlands, the coast and wider seascape;

iii) settlement setting, including approaches to settlements;

iv) the setting of green network corridors, such as important transport routes and the cycle and footpath network;

v) historic, natural and recreational features of interest, skylines and hill features, including important views to, from and within them.

For all development with the potential to have an impact on either Landscape Character or Landscape features (including their setting), appropriate mitigation measures should be considered as part of any planning application. Where there is potential for development to result in significant adverse landscape/visual impact, a landscape and visual impact assessment (LVIA) will be required. The Ayrshire Landscape Character Assessment (SNH, 1998) and North Ayrshire Settlement Development Strategy (Entec, 2008) provide further information on designations such as Local Landscape Character Areas and the Potential Limit of Development Expansion areas as shown on the map on page 81 and on our online proposals map. These landscape assessment documents, and any new or updated landscape assessments, will be key considerations in determining whether development proposals would be acceptable within the landscape."

Policy 17: Clyde Muirshiel Regional Park**.** This policy states that *"Proposals that affect Clyde Muirshiel Regional Park must have regard to the Park's statutory purpose of providing recreational access to the countryside.*

Proposals should also take account of wider objectives as set out in relevant management plans and strategies, namely to:

- *• Provide visitors of all ages and abilities the opportunity for quality recreation. Using its unique assets the Park will facilitate a high quality programme of leisure activities which contribute to the health agenda*
- *• Ensure the Park is an increasingly popular and productive venue for formal and informal education and outdoor learning. More people will participate in learning opportunities and will develop a better appreciation of the area's natural and cultural heritage*
- *• Ensure the Park is an attractive and ecologically important visitor destination with increased biodiversity value. The Park embraces opportunities for positive environmental change".*

Policy 24: Alignment with Marine Planning**.** This policy states that NAC *"will, in principle, support developments with a marine component or implication (such as marinas, ports, harbours, marine tourism and recreation, fish farming, and land based development associated with offshore energy projects and defence establishments) where they are within a recognised developed coastal location and provided they are consistent with Scotland's National Marine Plan and the emerging Regional Marine Plan for Clyde Marine Region.*

All marine proposals should identify environmental impacts and mitigate against these to ensure there are not any unacceptable adverse impacts.

Developments on coastal areas with significant constraints will be supported, in principle, only where they would also contribute to the economic regeneration or well-being of communities whose livelihood is dependent on marine or coastal activities.

Developments on undeveloped sections of coast which possess special environmental or cultural qualities, such as wild land will generally be resisted unless there would be a significant economic value of the development and that environmental impact issues can be satisfactorily addressed.

Generally development requiring new defences against coastal erosion or coastal flooding will not be supported except where there is a clear justification for a departure from the general policy to avoid development in areas at risk or where a scheme has already been identified in the Spatial Strategy or the current Ayrshire Shoreline Management Plan."

Other planning guidance

Seascape/Landscape Assessment of the Firth Of Clyde

To better understand the potential impact of new development on the coastal and seascape character of the Firth of Clyde, the Firth of Clyde Forum commissioned a strategic assessment[63].

The aim of the assessment is to identify key sensitivities relating to coastal landscape and seascapes and to provide management guidelines with respect to the following four types of generic development: offshore developments, including fish farms; settlement; other built development, including roads and coastal infrastructure; and land management.

According to the assessment, the application site lies on the Upper Firth of Clyde and the Cumbraes stretch of coastline.

To better understand the potential impact of new development on the coastal character of the Firth of Clyde, the strategic assessment divided the Upper Firth of Clyde coastline into the following fourteen CCAs (as shown on Figure 6.1: Seascape and Landscape Character):

- Cloch Point to Kip Marina.
- Kip Marina to Wemyss Bay.
- Skelmorlie.
- Skelmorlie to Largs.
- Largs.
- Largs to Goldenberry.
- Goldenberry to Farland Head.
- Great Cumbrae Island.
- Millport.
- Little Cumbrae Island.
- Bute: Garroch Head to White Port.
- Bute: White Port to Kerrytonlia Point.
- Bute: Kerrytonlia Point to Bogany Point.
- Toward to Dunoon.

6.3.4 Key issues emerging from policy context

The key seascape, landscape and visual issues associated with the proposed development have been identified as follows:

- The application site is located in an industrialised coastal location allocated for further built development as part of the Hunterston Strategic Development Area.
- The application site is located a considerable distance from any nationally designated landscapes such as NSAs or WLAs.
- The application site is located near locally designated assets and landscapes such as the Mainland Special Landscape Area (SLA), the Great Cumbrae SLA, the Little Cumbrae SLA, and Kelburn Castle Garden and Designed Landscape (GDL). The site is located near the non-Inventory-listed Hunterston Estate GDL, and the route of the Ayrshire Coastal Path.
- The scale, location, siting, and design of the proposed development should not result in unacceptable levels of significant adverse effects on seascape and landscape character, either individually or cumulatively.
- The application site lies relatively close to the settlement extents of Fairlie and the visual amenity of local residents should be protected.

6.3.5 Guidance

The overall method of assessment is based on the principles established in GLVIA3, which is widely recognised as best practice guidance.

GLVIA3 states that any assessment of effects and the assessment criteria used should be tailored to the specific nature and likely potential effects of the development proposed.

Consideration of coastal character has been informed by Scottish Natural Heritage's (SNH – now renamed NatureScot) Coastal Character Assessment[64]. Paragraph 1.7 of this guidance explains that '*Coastal character is made up of the often-narrow margin of the coastal edge, its immediate hinterland and areas of sea. These three key components of coastal character include what is commonly known as 'seascape.'*

Within the context of SLVIA, this assessment considers 'seascape' as the coastal counterpart to 'landscape'. As such, the method of assessment of effects applied to CCA receptors has been the same as the approach applied to the assessment of effects on terrestrial LCTs.

The following guidance has also been referred to in the SLVIA where appropriate:

- Landscape Character Assessment Guidance for England and Scotland[65].
- Landscape Sensitivity Assessment Guidance (Methodology)[66].
- NatureScot pre-application guidance for onshore wind farms[67].
- Hunterston PARC Development Framework[68].

6.4 Methodology

6.4.1 Introduction

This text provides the methodology for the assessment of the potential seascape, landscape and visual impacts arising from the proposed development.

The methodology has been developed in response to scoping opinions received from NAC, NatureScot, and SGMD, which provided specific guidance on what should be considered.

6.4.2 Scope of the assessment

This assessment considers the likely seascape, landscape and visual effects of the proposed development during the construction phase only.

63 Firth of Clyde Forum (2013) Seascape/Landscape Assessment of the Firth of Clyde
64 Scottish Natural Heritage (2018) Guidance note. Coastal Character Assessment. Version 1a
65 Carys Swanwick Department of Landscape University of Sheffield and Land Use Consultants on behalf of The Countryside Agency and Scottish Natural Heritage (2002). Landscape Character Assessment. Guidance for England and Scotland
66 NatureScot (2022) Landscape Sensitivity Assessment Guidance (Methodology). Available at: https://www.nature.scot/doc/landscape-sensitivity-assessment-guidance-methodology (Accessed: December 2023)
67 NatureScot (September 2023) NatureScot pre-application guidance for onshore wind farms. Available at: https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms (Accessed: December 2023)
68 Clydeport Operations Limited (2021) Hunterston PARC Development Framework

This assessment considers effects on seascape and landscape character (the effect on the seascape and landscape resource) and on visual amenity (the effect on people's visual amenity in specific locations).

Potential cumulative effects have also been considered in general terms.

The location of the proposed development requires the landscape assessment to pay due regard to seascape character. For the purposes of this assessment 'coastal character' (as defined and considered within published documents) is considered to capture seascape matters. Seascape is treated as a subset of coastal character. This assessment draws on published documentation relating to terrestrial landscape and coastal character but does not consider 'seascape' as a separate and additional topic.

6.4.3 Study area

The definition of an appropriate study area for the SLVIA is an important and established component.

The assessment study area for the proposed development has been defined based on guidance contained within GLVIA3 and the Visual Representation of Wind Farms[69]; relevant legislation; consultation feedback; and the initial computer-generated ZTV pattern prepared for the EIA Scoping Report.

The proposed development principally comprises the creation of a new quay and associated quayside infrastructure, laydown areas, access road, and erection of temporary site offices and staff welfare buildings.

The enabling works would generally be low lying, with all ground level activity at the proposed quay expected not to extend beyond 10m AOD.

Construction of the proposed development would also introduce larger temporary structures, activities, and uses at the quay (including visiting vessels). Whilst temporary in nature, the structures would be tall; potentially extending to an upper height limit of 50m AOD.

As a result, and to focus the assessment on potential significant effects, it was agreed with the variant consultees that a general study area of 5km radius around the proposed development was suitable for consideration of seascape and landscape character effects; the production of ZTVs; and the selection of representative viewpoints for the visual assessment.

6.4.4 Zones of theoretical visibility (ZTVs)

The adoption of a 5km radius general study area was informed by the production at the early stages of the assessment of a preliminary ZTV to a 15km radius. This demonstrated that the principal areas of theoretical visibility lay within 5km and that any occasional longer distance visibility would be unlikely to result in significant effects.

Banded ZTVs were produced to help explain the varying levels of potential visibility based on different temporary associated activities. These comprised ZTVs for the following:

- 10m AOD as proxy for ground level activities, low structures, and quayside traffic movements and activities at the proposed quay.
- 50m AOD to capture a likely upper limit for the height of any operations likely to be occurring in the vicinity of the quay, laydown area and landside areas such as introduction of tall mast lighting columns, cranage, and cargo movements from larger ships.

69 SNH (2017) Visual Representation of Wind Farms, Version 2.2

6.4.5 Determining baseline seascape, landscape and visual conditions

Baseline seascape, landscape and visual assessments have been undertaken in parallel and have been informed by a combination of desk and field-based techniques.

Desktop assessment

As a starting point for the assessment, a desk study of the application site and the study area was undertaken.

The desk study was used to identify aspects of the seascape, landscape and visual resource to be considered in the SLVIA including any designated landscapes in the study area, i.e., SLAs; CCAs; LCTs; presence or future presence of built developments; as well as views from settled areas and linear routes (including roads, railway lines, National Cycle Routes, and long-distance walking routes).

Preliminary identification, description and evaluation of the existing seascape, landscape and visual context of the study area has involved a desk-based review and interrogation of the following principal information sources:

- NatureScot's national landscape character assessments – identification of LCTs in the vicinity of the application site and across the study area. According to NatureScot[70], the application site is located in LCT: 59 Raised Beach Coast and Cliffs, as shown on Figure 6.1: Seascape and Landscape Character.
- Coastal character areas (CCAs) identified in the Seascape/Landscape Assessment of the Firth of Clyde. According to the assessment, the application site lies on the Upper Firth of Clyde and the Cumbraes stretch of coastline.
- Ordnance Survey mapping and aerial photography relating to existing landform, vegetation, settlement patterns, promoted viewpoints, and drainage regimes.
- Plans containing information relating to designated landscapes and landscape related policies at the local and national level.

The desk study was further informed by review of legislation, planning policy and guidance (see Section 6.3: Policy, Legislation and Guidance), as well as local and national planning portals. A full list of references is provided in Section 6.3 (Policy, Legislation and Guidance).

Initial computer-generated ZTV maps and wirelines were produced to provide an indication of seascape, landscape and visual receptors likely to experience views of the proposed development, and therefore be key to the assessment.

Field assessment

Field surveys have been undertaken during periods of clement weather in January 2024 from public highways, footpaths, and publicly accessible areas. Field work has involved:

- A corroboration of the findings of the desktop review;
- Collection of additional information on landscape elements, seascape and landscape character, views, and localised screening; and
- Baseline viewpoint photography from the nine agreed representative viewpoints.

Field surveys were carried out throughout the 5km radius study area; although, survey work focussed on parcels of land shown as having theoretical visibility of the proposed development on the ZTV (see Figure 6.3: Bareground Zone of Theoretical Visibility with Representative Viewpoint Locations).

70 NatureScot (2019) Landscape Character Types (LCTs) SNH 2019. Available online: https://www.arcgis.com/apps/webappviewer/index.html?id=e3b4fbb9fc504cc4abd04e1ebc891d4e&extent=-2030551.0017%2C6851563.2052%2C1100309.6769%2C8923312.4198%2C102100

Visual receptors

Visual receptors have been identified that lie within the ZTV of the proposed development within a 5km radius of the application site.

Visual receptors comprise people in different locations. Key categories include residents, users of footpaths (in particular, designated recreational routes and core paths) and users of local roads. The locations of these receptors in the context of the 5km radius study area has informed the selection of the representative viewpoints. Consideration of footpath users acknowledges general rights of access for recreational purposes near the Firth of Clyde but focuses on designated recreational routes and the core path network.

6.4.6 Representative viewpoints and photography and visualisations

The visual assessment principally draws on detailed consideration of selected representative viewpoints across the 5km radius general study area.

Nine representative viewpoint locations have been identified and agreed with NatureScot, SGMD, and NAC. All of these locations are terrestrial. The viewpoints have principally been taken from the Ayrshire mainland; although, three are located on Great Cumbrae Island. Views from the sea (Fairlie Roads) have not been included in the representative viewpoint assessment due to the absence of any marked ferry route in the 5km study area.

A panoramic photographed baseline image has been presented for each representative viewpoint and the anticipated effects upon it described and assessed within this chapter.

With the Hunterston peninsula considerably industrialised at present, it was considered appropriate for baseline photographs to be taken during daylight hours in one season only. Winter photography has been obtained to represent the worst case visibility scenario.

Verified photomontage visualisations of the proposed development are not included for any of the agreed representative viewpoints. This is principally because construction activities associated with the proposed quay would be temporary in nature. Vehicles, ships, and boats visiting the application site would also be transient. As a result, any photomontage image featuring temporary elements would be highly conjectural.

6.4.7 Assessment criteria

In accordance with GLVIA3, professional judgement has been used to assess the sensitivity of the baseline seascape, landscape and visual environment and to consider the magnitude of potential change that the proposed development would cause. These are then combined to consider the level of effect and its significance. Major and moderate levels of effect are generally regarded to be significant.

Landscape and coastal character typologies

The sensitivity of LCTs and CCAs has been assessed by combining the susceptibility of their key characteristics to the type of changes likely to be associated with the proposed development with the value or importance understood to be attached to the area.

Key characteristics can include matters such as scale; enclosure; openness, landform; landcover; landscape pattern; and manmade influences. The sensitivity of LCTs and CCAs are assessed as High, Medium, or Low using professional judgement.

Assessment of the magnitude of change may take account of all the following factors, with professional judgement used to determine the relevance and appropriate weighting to be attributed to each:

- The degree of change that takes place;
- The geographical extent of the LCT or CCA that will be changed;
- The likely duration of the change to the LCT or CCA; and
- Whether the change would be reversible.

The degree of likely change is assessed as High, Medium, Low or Negligible. A judgement of a High change is typically defined as the development forming a prominent element or a development that would result in a substantial alteration to key characteristics. A judgement of a Negligible magnitude of change is typically defined as the development would be barely perceptible or would not change the key characteristics.

A final judgement on the overall level of effect on the LCT or CCA has then been made by combining the sensitivity of the receiving environment with the magnitude of change to it. The level of effect has been described using a four-point scale of Major, Moderate, Minor or Negligible and the nature of effect has been judged as adverse, beneficial, or neutral. Reasoned professional judgement has been used to combine considerations and assess the overall level of effect.

Visual

The sensitivity of visual receptors and representative viewpoints has been assessed by considering their visual susceptibility with regards to the value, or importance, that they are likely to attribute to their available views. The sensitivity of the receptors has been assessed as High, Medium, or Low using professional judgement.

Typically, high sensitivity receptors are people with a particular interest in their available view or with prolonged viewing opportunities such as residents, or residential receptors at: tourist destinations that provide a specific important and highly valued view; hilltops; ornamental parks/designed landscapes; or utilising routes and core paths.

Typically, low sensitivity receptors are people with a passing interest in their surroundings such as those at places of employment; major highways (excluding those likely to attract high levels of tourist traffic); commercial buildings; and commuters.

Assessment of the magnitude of visual change may take account of all the following elements and professional judgement has been used to determine the relevance and appropriate weighting to be attributed to each:

- The degree of visual change that takes place;
- The geographical extent of the area from which the change would be visible;
- The likely duration of the visual change; and
- Whether the visual change is likely to be reversible.

The degree of likely visual change has been assessed as High, Medium, Low or Negligible. A judgement of a High magnitude of change is typically defined as one where the proposed development would form a prominent element within the view, resulting in a prominent change to the quality and character of the view. A judgement of a Negligible magnitude of change is typically defined as when the proposed development would result in a barely perceptible change in the view or would cause no change to the existing view.

A final judgement has been made on the overall level of effect on the visual receptors by combing their sensitivity with the magnitude of visual change that they would likely experience. Overall effects are described using a four-point scale of Major, Moderate, Minor or Negligible and the nature of effect judged as adverse, beneficial, or nature. Reasoned professional judgement has been used to combine considerations and assess the overall level of visual effect.

6.4.8 Cumulative effects

Potential cumulative effects with other consented and proposed developments have been considered in general terms. NatureScot identified a preliminary list of developments for inclusion within the scope of the cumulative assessment in their scoping opinion response (dated November 2023). This noted that there are several consented and proposed schemes adjacent to the proposal, e.g. Bakkafrost aquaculture facility, Fastrig demonstration project and the XLCC submarine cable factory. In this regard it is noted that the Fastrig only has a temporary planning permission so in terms of potential impact during the construction phase of the proposed development the test sail will have been removed well in advance of the proposed development commencing on-site. The assessment also gives general consideration to the potential for cumulative effects with a proposed grid stability facility at the former Hunterston coal terminal (a small site located close just to the north of the eastern end of the proposed access road).

6.5 Baseline

6.5.1 Introduction

The seascape, landscape and visual baseline study identifies aspects of the seascape, landscape and visual resource that may be affected by the proposed development and provides a description of the existing seascape, landscape and visual conditions in the area that may be significantly affected.

The establishment of the baseline, when reviewed alongside the description of the proposed development, forms the basis for the identification and description of the potential seascape, landscape and visual effects.

The baseline description of the seascapes and landscapes that may be affected is primarily determined by the physical footprint of the proposed development components and the corresponding ZTV pattern (see Figures 6.4: Bareground Zone of Theoretical Visibility with Seascape and Landscape Character).

The baseline also describes current pressures that may cause change in the seascape and landscape environment in the future, in particular drawing on information for future built developments that are not yet present in the landscape. Existing and under construction developments are regarded as part of the baseline seascape and landscape environment of the area, with the proposed development assessed within this context.

To inform the EIA Scoping Opinion Request report, an initial desk based assessment was undertaken to identify those seascape, landscape and visual receptors that may have the potential to experience significant effects, and therefore have to be assessed as part of the SLVIA (see Section 2: Scoping and Consultation).

6.5.2 Landscape and visual baseline overview

Application site

The application site, which extends into the Firth of Clyde, lies in a low-lying area on the coastal hinterland between the Fairlie Roads sea channel and higher moorland to the east. The application site includes open water as well as reclaimed land which has been formed to accommodate an access road, service infrastructure, a deep dry dock, and a hammerhead quay. The site is presently armour stone protected.

The application site is accessed from the A78 via the Hunterston Roundabout and Power Station Road, which leads onto Oilrig Road.

The application site is largely enclosed by Fairlie Roads, the sand flats at Hunterston Sands and Southannan Sands, and the estate landscape associated with Hunterston Castle.

Application site context

The Hunterston peninsula and surrounding area is characterised by a combination of open water, and coastal, recreational, industrial, residential, and agricultural land uses.

There is considerable evidence of infrastructure in the vicinity owing to the presence of the Hunterston Power Station and the redundant Hunterston Coal Terminal, which lends a distinctly industrial character to the landscape.

The designed landscapes of Kelburn and Hunterston help characterise the hinterland.

The surrounding sea channels are frequented by ferries, container ships, yachts, craft boats, and fishing boats, which create visual movement in the landscape. Beach related and water-based recreational activities along the Ayrshire coastline add to the seascape and landscape character.

The town of Millport is located on Great Cumbrae Island ~1.4 km northwest of the application site, whilst the village of Fairlie is located ~1.9km northeast. The hamlet of Portencross is located ~3.5km south-southwest. Other settlements include the village of West Kilbride, which lies over 4.0 km southeast.

The A78, which extends between Greenock and Monkton via Irvine, routes close to the Firth of Clyde; providing access between several coastal towns and villages.

Towards the north-eastern extents of the study area lies the foothills of the Waterhead Moor/Muirshiel hill-range which forms the high moorland core of the Clyde Muirshiel Regional Park.

The current mosaic of woodland blocks, tree belts and coniferous plantations in the study area slightly influences the locale. Whilst it is recognised that commercial plantation compartments are constantly changing as areas of plantation are felled and replanted, potentially altering localised visual effects, it is considered that the wider pattern would remain relatively constant across the construction period, with woodland tree cover therefore providing a continual and considerable level of influence across the wider extents of the study area.

Overall, land within the study area is considered to be largely utilised for coastal and industrial purposes; although, the combination of residential, recreational, renewable energy generation, and agricultural land uses plays an important role in defining the surrounding seascape and landscape context.

Seascape character

The seascape assessment considers the effect of the proposed development on the regional seascape areas and local CCAs around the Firth of Clyde coastline. The seascape and coastal character typologies found in the study area are as shown on Figure 6.1: Seascape and Landscape Character, with Figure 6.4: Bareground Zone of Theoretical Visibility with Seascape and Landscape Character illustrating the ZTV for the proposed development overlaid over the character typologies.

According to the Seascape/Landscape Assessment of the Firth of Clyde, the application site lies on the Upper Firth of Clyde and the Cumbraes stretch of coastline, which has been divided into fourteen CCAs.

Of these, the Largs to Goldenberry (UFC6), Great Cumbrae Island (UFC8), Millport (UFC9) and Little Cumbrae (UFC10) CCAs are of most interest.

The strategic assessment describes the key characteristics of the Largs to Goldenberry CCA as follows:

- *"**Maritime influences and experience from the sea.** Fairlie Roads is a narrow channel, but it is also one of the deepest sea entrance channels in northern Europe. These narrow seaways around the Cumbraes are a key transition point between the Lower and Upper Firths. The shoreline is largely dominated by imported*

material that emphasise the need for protection from waves, winds and tides. Yet the close proximity of Little and Great Cumbrae islands provide shelter and reduces the expansiveness of the sea.

- ***Maritime development and activity.*** *There is frequent maritime activity, with yachts travelling to and from Largs Yacht Haven which has berths for 750 boats. There are additional serviced moorings and covered storage at Fairlie marina. Large vessels berth at Hunterston, the Clydeport deepwater terminal, which is the UK's largest port for importing ore and coal. The mile long gantry with its two travelling gantry cranes reaches out into the Fairle Roads channel.*
- ***Character and experience of the coastline.*** *While much of the coast is modified with a narrow tidal reach, there are large sandy beaches, important for birdlife, at south Fairlie, Gull's Walk and Hunterston Sands revealed at low tide. Most of the coastline between these has been very modified and is protected by rock embankments, paved revetments, rip rap, sea walls and gabion walls. There are extensive areas of reclaimed land. Jetties, piers and headlands project into the sea at regular intervals. Access to much of the shore is difficult and is frequently restricted by security fencing, with the exception of the excellent shoreline access below sea and garden walls at Fairlie. There is a car park and picnic area on headlands to north and south of Fairlie.*
- ***Topography and land use of hinterland.*** *The coast and its immediate hinterland are greatly modified especially where the industrial yards are located at Hunterston. The town of Fairlie sits on a low coastal ledge, with the Clyde Muirshiel Hills, including the prominent Kaim Hill, rising behind. The steep wooded slopes combine pasture with belts of woodland associated with the setting of Kelburn Castle and Country Park. Further policies are associated with Hunterston House. Kelburn windfarm is located behind Fairlie in the Clyde Muirshiel Regional Park. The Ayrshire Coastal path is set back from the coast along part of this stretch.*
- ***Settlement pattern, built development and infrastructure.*** *The only residential settlement is Fairlie, a small village hugging the sweeping bay between two headlands and taking advantage wherever possible of the sea views. The main road and the railway are set back from the coast, with the result that houses extend down to the shore, protected by high sea and garden walls. The area is dominated by the large infrastructure associated with two nuclear power stations, Clydeport terminal, the construction yard and turbine testing station, pylons, the conveyor to the coal railhead and the marinas.*
- ***Setting of landmarks and features.*** *The Hunterston cranes are sculptural landmarks, and the ships moored at their pier are lit at night, creating temporary features. Hunterston B is also lit at night. Kaim Hill's distinctive profile is a landmark on an otherwise unremarkable skyline. The Waste Water Treatment Works, designed to look in keeping as a Victorian red brick building, is located on the former jetty at Fairlie and is a local feature.*
- ***Experience of isolated coast.*** *There is no experience of isolation on this coast, which is limited by the amount of development and the sound of activity.*
- ***Aesthetic qualities.*** *The simplicity of Fairlie, with its buildings (including recent residential development), directly fronting the sea creates a settlement of unity and integrity.*
- ***Visual amenity and key Viewpoints.*** *The Ayrshire Coastal Path is a key viewpoint, especially around Hunterston where access by vehicle is not encouraged. The Largs marina provides a promontory viewpoint, as do the headlands to north and south of Fairlie where there are picnic sites. The recognisable profiles of the Cumbraes, Arran and the Cowal hills are visible from this coast, and can be back lit at sunset."*

With respect to sensitivity to development, the strategic assessment states:

- ***"Off shore development including fish farms.*** *High sensitivity. The enclosure created by Great Cumbrae island reduces the sense of expanse and capacity to absorb structures. Structures closer to shore will be overlooked in places. Although the coast has been heavily industrialised, the cranes of Clydeport Hunterston terminal, the coal conveyor and the proposed testing site for wind turbines increase the sensitivity of the remaining undeveloped sea to other structures, as there is a danger of visual clutter.*
- ***Settlement.*** *Some sensitivity. The setting of Kelburn Castle is a key sensitivity. Maintaining separation between Largs and Fairlie will assist in retaining their separate identities. The focus of Fairlie on a particular stretch of bay between two promontories gives it a clear identity in an area which could be cluttered with development.*
- ***Other built development, including roads and coastal infrastructure.*** *Some sensitivity. The Hunterston peninsula is heavily industrialised and continues to be considered for further built development, which would be appropriate. Key sensitivities include the view north to the "Arrochar Alps" from Hunterston House, from the A78, from West Kilbride and from the "Fairlie Moor" or "Dalry Moor" C-road. The extension of either marina may intrude further into views from Kelburn Castle. Whilst the shore is industrialised, tall structures on the adjacent hills would complicate the simple backdrop that the uplands provide.*
- ***Land management.*** *Low sensitivity. It is unlikely that changes to land use behind the settlement will affect the setting of this stretch of coast."*

The strategic assessment has provided the following opportunities and guidance for built development on Largs to Goldenberry:

- *"Views to the sea and Great Cumbrae from Kelburn Castle and the Country Park are highly sensitive, and incursion into the designed landscape by housing development should be discouraged.*
- *Continued undertaking an audit of the signage, footpath network and the 'street furniture' within this area, to encourage use of the access network.*
- *Consider facilitating access to the shore for bird watching at Hunterston Sands and Gull's Walk.*
- *There may be scope for linking the Ayrshire Coastal Path up to the top of Goldenberry Hill, and facilitating a limited amount of car parking.*
- *Consider ways to reclaim and celebrate the history of the Fife yachts at Fairlie."*

The strategic assessment describes the key characteristics of the Great Cumbrae Island CCA (UFC8) as follows:

- ***"Maritime influences and experience from the sea.*** *Along with Little Cumbrae, Great Cumbrae lies between the mainland and Bute, where it divides this Upper Firth into two channels, a constriction which reinforces the sense of 'gateway' into the Upper firth. While the channels are relatively sheltered by Bute and the Cumbraes, they can be exposed from the north and south. The island is low, and the entire shoreline seems dominated by natural forces, with waves and winds sculpting the sandstone rocks.*
- ***Maritime development and activity.*** *The Ro-Ro ferry runs every half hour from Largs to the Tattie Pier. The ferries for Dunoon and Rothesay are clearly visible crossing the Firth to the north. The channels are frequented by sailing dinghies from the Water Sports Training Centre and yachts from Largs and Fairlie marinas. Anchorages are available at Balloch Bay and Tormont End. Fishing boats and kayaks also come close to the shore. Navy vessels can be seen on exercise. Tramp steamers and cargo vessels pass relatively close to the west, PS Waverley passes en route to Millport. Large container ships at Hunterston ore terminal can be heard off loading their cargo.*
- ***Character and experience of the coastline****. The island exhibits a very wide variety of experiences in its 10 mile circumference. Access to the coast is easy from the coast road, where people on bicycles seem to outnumber cars. Frequent small lay-bys, seats and picnic areas allow the shore to be experienced at close range. There are several slips, jetties, and pontoons. Various monuments – the oldest dated 1844, the newest 2005 – commemorate loss of life at sea, adding to the sense of place. Most of the shore is dominated by wind and water. Sculpted Old Red Sandstone slabs are interspersed by small gritty, shelly or pebbly beaches. Pale igneous dykes form low walls in the sandy beaches and jut into the sea. The shore is backed by salt marsh, a grass verge with wildflowers, or occasional trees on the east coast; occasionally this is replaced by an in-situ concrete slope or rip rap.*
- ***Topography and land use of hinterland.*** *There is a raised beach behind much of the coast, and where there is localised sheltered low ground there are sheep or black cattle grazing in sight of the sea. There is marshland - willow carr and yellow flag iris - where there is a high water table. The island rises in a few wooded terraces and cliffs – colourful in autumn - to enclosed grazing fields with some arable, and open moorland with small lochans on the highest ground. There is one golf course, known for its panoramic views and challenging golf.*

- ***Settlement pattern, built development and infrastructure.*** *Outside Millport, this island is sparsely settled, with farms on higher ground that are tucked away and difficult to see from the sea. The coast and hill roads provide access to most of the island, and there is a good footpath network. There are isolated buildings dotted around the coast behind the shore road, including the Glasgow University's Marine Biological Research Station and a Water Sports Centre. There is one caravan site, discretely located behind the skyline.*
- ***Setting of landmarks and features.*** *There are several notable and poignant memorials: Tomont End - prominent obelisk erected to two Midshipmen drowned in 1844; Keppel Pier - a monument to the safe return here of the Scottish National Antarctic Expedition in 1904; and the modern "memorial to the missing" (2005) who have "no known grave" is a metal plate allowing views of Bute through pierced shapes of four servicemen. Painted rocky features are a feature that is unique to Cumbrae – "the Indian" is a local landmark. Other cliffs are named for their shapes e.g. "the lion".*
- ***Experience of isolated coast.*** *Away from Millport, the coast is often very secluded but the evidence of human activity and modest recreational development limits sense of isolation. Seclusion is reinforced by the separation created by its island location, the semi-natural character of the vegetation as well as limited built development, the lack of kerbs and pavements and the absence of traffic.*
- ***Aesthetic qualities.*** *The appeal of the island lies in its relative accessibility – the excitement of ferry crossing – and the way the peaceful tranquillity of the rocky coast contrasts with the gentle busyness of the Millport resort. The drama of this coastline is in part created by the easily recognisable shapes of the cliffs and the sculpted shapes of the rocks at the shore. The varied texture of the vegetation – from wildflowers to scrub to grazed pasture and woodland – and the sense of dynamism on the immediate coast, all set against the reflective sea, adds to the attraction of this coastline. There is no lighting on the coast, except at the slipway, with dark skies experienced especially on the west coast.*
- ***Visual amenity and key Viewpoints.*** *The sequential "reveal" of dramatic views and features characterises the island's coast. There are many stopping points and laybys, seats, monuments and other features which are viewpoints, and Farland Point is popular for walking to the shore to sit and enjoy the view or have a BBQ. Views from the sea, including from yachts and kayakers close to shore, as well as the ferry, are also significant. There are panoramic views from the Glaid Stone at 127m. Because of its location set back from the mainland coast, views from the island are extensive, reaching to Cowal and the Arrochar Alps, the peaks of Arran, often seen in profile with the sun behind, and even Ailsa Craig and the Galloway Hills."*

With respect to sensitivity to development, the strategic assessment states:

- ***"Off shore development including fish farms****. High sensitivity. The irregular shape and often remote character of the coast is the key constraint for low-lying offshore development, especially on the north and west side of the island. The narrowness of the sea channels is a further constraint, as are seaward views to Arran and the setting of Little or Wee Cumbrae and Bute. Taller structures will be more visually intrusive. To the east, the presence of the infrastructure at Hunterston limits development which may add to visual clutter.*
- ***Settlement.*** *Very high sensitivity. There is very little coastal settlement and scope for buildings close to the shore is limited by the sense of seclusion, its semi-natural character, and the need to maintain an attractive setting to key features.*
- ***Other built development, including roads and coastal infrastructure.*** *High sensitivity. The seclusion of this coast is in part reinforced by the lack of development and dominance of semi-natural vegetation pattern along the immediate coast. This experience would be compromised and diminished by additional structures, including masts and turbines, roads and associated traffic and other infrastructure which added clutter and detracted from the drama of the coastline.*
- ***Land management.*** *Low sensitivity. The expansion of semi natural woodland would not detract from the semi-natural character of this stretch of coast, as long as views along the coast and notable geological features were respected. The land use of the hinterland has very little impact on the experience of the coast."*

The strategic assessment has provided the following opportunities and guidance for built development on Great Cumbrae Island:

- *"It is important to minimise the urbanisation of the rural shoreline of Big Cumbrae to retain the contrast with the resort of Millport.*
- *Further built development should be resisted to retain the contrast between rural Cumbrae and the resort of Millport.*
- *Views to Arran, Bute and Little Cumbrae are a particular feature of this stretch of coast and should be considered in the siting of off shore structures.*
- *There is no lighting at the coast, except at the slipway, and a policy of minimising lighting should be maintained to reinforce the remote character of the coast and the 'dark skies' potential of the west coast.*
- *The easy accessibility of this stretch of secluded and isolated coast is likely to make it as suitable for kayaking and exploration from the sea as from the land, and this should be considered in assessing the impacts of any future development or recreational interest.*
- *There may be opportunities to promote and improve pedestrian access to the shore at Portachur Point.*
- *Litter can be a problem that reduces the aesthetic appeal at popular locations: community engagement in clean-up operations may be appropriate.*
- *Consider reducing the area of manicured mown grass at the Tattie Pier, or reducing the number of cuts, to reduce the stark contrast with the semi-natural shore."*

The strategic assessment describes the key characteristics of Millport CCA (UFC9) as follows:

- ***"Maritime influences and experience from the sea.*** *Millport is sheltered, but the sandy beach and its rocky exposures are revealed at low tide, reinforcing a sense of dynamism associated with the sea. The sense of shelter is created by a few small islands called The Eileans that create a false horizon in Millport Bay and by Wee Cumbrae 1 km to the south.*
- ***Maritime development and activity.*** *The PS Waverley calls at Millport Pier during the summer, where fishing boats are moored. Boats moor at buoys in Millport Bay, but it is not a suitable anchorage if storms are forecast from the south or southwest. There is a small informal yacht storage yard at the west end of the bay.*
- ***Character and experience of the coastline.*** *The resort of Millport is sited on an irrethear, partially rocky bay that indents the south coast of Great Cumbrae. The scattered offshore islands add to the irregularity of the coast. It is a seaside resort typical of that enjoyed by Victorian trippers going "doon the watter" from Glasgow. The esplanade and promenade extend behind a sea wall with railings and steps, overlooking a series of sandy beaches separated by rocky headlands. Buildings are set back from the shore, partially separated by the road and a mown grass sward. At the centre of the resort, the sea wall is replaced by fine stone pitching between the beach and pavement. There are play areas, shelters or pavilions and "the crocodile" (a painted rock sill) at the beach. Cordyline Australis trees add an exotic touch.*
- ***Topography and land use of hinterland.*** *Millport is set in a bowl behind Millport Bay. There is one golf course, known for its panoramic views, and a caravan site tucked away behind the town. The island rises steeply behind the town to enclosed grazing fields and pockets of woodland.*
- ***Settlement pattern, built development and infrastructure.*** *Millport's cottages, colourful boarding houses, sandstone terraces and grand villas are set back from the shore. The town is established on a tight linear grid pattern which extends parallel to the coast. Large villas have the sunniest west facing sites at the east end of the beach. Relatively recent development is on low ground inland, out of sight of the sea. Millport has a stone and timber quay. Built development extends along the coast, almost merging with a hotel and associated chalets to the west at Doughend Hole.*
- ***Setting of landmarks and features.*** *Painted rocky exposures are a feature of Cumbrae – "the crocodile" at the beach is a local landmark. Millport's war memorial is a Mercat cross style Valiant in strife, victors in death, by the shore. The slender 37m spire of the smallest cathedral in Britain, the Cathedral of the Argyll and the Isles (1851), is visible above the trees behind the shore road. "The Garrison" mansion (1819) stands apart behind the shore road.*
- *Experience of isolated coast. Millport is urbanised in character, with no experience of isolated or even secluded coast.*

- ***Aesthetic qualities**. The gentle bustle of this well-kept and tidy resort contrasts with the peaceful tranquillity of the rest of the island, and the wide sandy beach with its sills of rock contrasts with the rocky coast. The well known "illuminations" at Millport that mark the end of its season and are a local attraction.*
- ***Visual amenity and key Viewpoints.** Key viewpoints are all along the promenade, esplanade and at the pier which gives more panoramic views. The tilted terraces, Castle, Old and New Lighthouses of Little Cumbrae island, together with the serrated skyline of the Isle of Arran, are significant features in views from the bay, as is the development at Hunterston.*

With respect to sensitivity to development, the strategic assessment states:

- ***Offshore development including fish farms.** High sensitivity. A key constraint is the enclosure of the bay and the irregular coast. Further constraints include seaward views to Arran and the setting of the scattered offshore islands and the Little or Wee Cumbrae, and Millport's views focus on the near shore. Taller structures will be more visually intrusive.*
- ***Settlement.** High sensitivity. There is a 'resort' character to Millport which is a key consideration in any future coastal development. Both the design and the build quality of structures needs to be high to maintain the feel of a resort, and to avoid adding insensitively to the architectural mix. Creating ribbon development, by joining Millport to isolated groups of buildings at either end, would be out of scale and reduce the visual coherence of the town and weaken its strong relationship to its bay.*
- ***Other built development, including roads and coastal infrastructure.** High sensitivity. There may be scope to site appropriate development set back from the coast, but the key sensitivities relate to the potential for visual clutter if new infrastructure and development introduces more sizes and types of development without regard to existing structures, or if it competed with the Cathedral spire. Additional clutter should be avoided, as the simple design of key elements such as the promenade and the grassy sward (which are a unifying foil to the variety of building styles) can be easily compromised.*
- ***Land management.** Low sensitivity. The land use of the hinterland has very little impact on the experience of the coast."*

The strategic assessment has provided the following opportunities and guidance for built development on Millport:

- *"There is a risk that additional land-based development will add ribbon development to Millport, therefore size, massing, design and setting of any additional development should aim to work closely with established patterns of development.*
- *Development should be resisted between the road and the coast wherever possible, to limit impacts on views of the sea.*
- *Views to The Eileans in the bay, to Little Cumbrae, and to Arran, are a particular feature of this stretch of coast, and should be considered in the siting of offshore structures.*
- *It is important to restore, maintain, enhance and upgrade where necessary the quality of the built structures and infrastructure – including paving, railings, street furniture, and the paddling pool and boating pond – and the distinctive planting, such as the cordyline trees, to consolidate the impression of a high-quality resort and 'seaside' atmosphere.*
- *Care should be taken to avoid adding additional clutter or fragmenting the grass frontage to allow the promenade and the grass frontage to dominate and unify the front."*

The strategic assessment describes the key characteristics of Little Cumbrae CCA (UFC10) as follows:

- *"Maritime influences and experience from the sea. Along with Great Cumbrae, Wee Cumbrae lies between the mainland and Bute, where it divides this Upper Firth into two channels, a constriction which reinforces the sense of 'gateway' into the Upper firth. While the channels are relatively sheltered by Bute and the Cumbraes, they can be exposed from the north and south. The island is low, and the entire shoreline seems largely dominated by natural forces, with waves, winds and tides sculpting the rocks.*
- *Maritime development and activity. Container ships from Hunterston Terminal pass close by the island, as do pleasure craft, fishing boats, navy vessels and cruise liners. There is private access by boat from Largs or Millport, with landings possible at the lighthouse on the west coast, and moorings and a jetty near the House on the east coast.3 Temporary anchorages are available in the bay north of the Castle Island. The passing ships allow the island to be scaled in views from the mainland.*
- *Character and experience of the coastline. The island is small with a rocky shoreline, and a series of smaller islands along the east facing shore. The shoreline is characterised by dramatic cliffs and large boulders which make access to the foreshore difficult. A wave cut platform forms a skirt around some of the island at low tide, backed by cliffs that form a backdrop to the imposing Little Cumbrae House on the east coast.*
- *Topography and land use of hinterland. The island forms a flattened wedge, rising in a series of tilted terraces to 123m with the "trap" profile typical of its basalt geology. Scrub, bracken and low trees emphasise the steeper areas between exposed outcrops and basalt cliffs. The hill is open, with lush green semi-rough grassland, interspersed with marshes and small lochans in local hollows. An escarpment backs the shore on the east coast, while there is a more pronounced raised platform on the west coast. There has been some recent tree planting.*
- *Settlement pattern, built development and infrastructure. Sparsely developed, there is a mansion house, with its gardens originally designed by Gertrude Jekyll, a few estate cottages and the jetty partially sheltered against an escarpment on the east coast. A 14th century tower house is a prominent feature on a small island offshore, with panoramic views from the roof, mirroring similar castles such as Portencross, all guarding the upper reaches of the Firth of Clyde. Two lighthouses allow for safe shipping. The island has one of only two Scottish coal-burning lights (1757) on the hilltop - a plaque above the door of the Old Lighthouse states "ostendimus litora flammis" – "flames light the coast". There are no roads and access to the coast is only achieved by boat.*
- *Setting of landmarks and features. The tower house stands near sea level on a separate small island, paired with Portencross Castle on the mainland. It is prominent in views from the north where is it seen as an isolated feature. From the mainland, it is backclothed by the dark island and much less noticeable. The New Lighthouse is prominent on the west coast.*
- *Experience of isolated coast. This island feels remote, as it is difficult to access except by kayak. Permission is required to land. The remoteness is reinforced by the semi-natural character of the vegetation as well as limited built development and the many species of birds present. However, the sense of isolation is likely to be slightly reduced by the presence of the ore and coal ships passing close by, and by the sight of Hunterston nuclear power station 3 km to the east.*
- *Aesthetic qualities. The drama of this coastline is in part created by the dark cliffs and rocky terraces. The varied texture of the vegetation – from maintained gardens to woodland, scrub and moorland – and the sense of dynamism and movement, all set against the expanse of the sea, adds to the attraction of this coastline. The Gertrude Jekyll gardens by the House, albeit not in their original condition, add an unexpected element of pleasure and bring seasonal colour.*
- *Visual amenity and key Viewpoints. The island with its distinctive low profile is a visual focal point in much wider views from neighbouring islands and mainland hilltops, except where Arran stands behind as a backcloth and draws the eye to its peaks. From the Isles of Bute and Arran, and the sea to the west, the higher hills above the mainland coast behind are more significant than the island, and backcloth it.*

With respect to sensitivity to development, the strategic assessment states:

- *"Offshore development including fish farms. High sensitivity. The irregular shape and often remote character of the coast is the key constraint for low-lying offshore development, especially on the north and west side of the island. The narrowness of the sea channels is a further constraint, as are seaward views to Arran and the setting of Little or Wee Cumbrae and Bute. Taller structures will be more visually intrusive.*
- *Settlement. Some sensitivity. Scope for buildings close to the shore is limited by the sense of seclusion, the semi-natural character, and the need to maintain an attractive setting to the House and the old castle. There is scope for a limited number of buildings which would be best located at the base of the coastal escarpment*

so as not to break the distinctive skyline but designed to be unobtrusive and to avoid competing with the House and Castle
- *Other built development, including roads and coastal infrastructure. High sensitivity. For the most part of the remote character of this island is a major limitation to development, and the backdrop of Arran is a further constraint. The experience of this semi natural island would be compromised and diminished by development, even more so to structures that are taller than the lighthouse.*
- *Land management. Low sensitivity. The expansion of the natural woodland would not detract from the aesthetic qualities or semi-natural character of this stretch of coast but may obscure the distinctive terraced profile in views from the mainland and Great Cumbrae. Changes to land use of the hinterland is likely to have very little impact on the experience of the coast of the island."*

The strategic assessment has provided the following opportunities and guidance for built development on Little Cumbrae:

- *"Any development may impact on the experience and visual drama as well as the landscape character of the relatively wild west coast and blur the island's distinctive profile.*
- *There is some limited scope for appropriate, small scale and low profiled development on the east coast in association with the existing group of buildings. However, all built development will reduce this sense of seclusion.*
- *There is some scope for restoring unused buildings such as the New Lighthouse.*
- *This stretch of secluded and isolated coast is suitable for kayaking and exploration from the sea, and this should be considered in assessing the impacts of any future development or recreational interest.*
- *Support any restoration of the Gertrude Jekyll garden and the House."*

Landscape character

The landscape assessment considers the effect of the proposed development on the landscape character typologies covering the application site and the surrounding area. The LCTs found in the study area are as shown on Figure 6.1: Seascape and Landscape Character, with Figure 6.4: Bareground Zone of Theoretical Visibility with Seascape and Landscape Character illustrating the ZTV for the proposed development overlaid over the LCTs.

Much of the study area was originally covered in the Ayrshire Landscape Character Assessment[71] (LCA), which described and categorised the landscape of the regions into distinct character types, now shown by the digital map based national LCA published by Scottish Natural Heritage (SNH, now NatureScot) in 2019[72].

Whilst this new dataset supersedes the original LCAs commissioned by SNH in the 1990s, this SLVIA has paid cognisance to the previous LCA, particularly with regards to guidance notes and descriptions provided for those LCTs included for detailed assessment.

According to NatureScot, the application site lies in LCT 59: Raised Beach Coast and Cliffs, as shown on Figure 6.1: Seascape and Landscape Character.

The guidance lists the following as key characteristics of the 'host' LCT:

- *"Raised beach, visible as a level shelf backed by a steep, sometimes craggy escarpment representing the former cliff line, above which lies more gently rising land.*
- *Rocky coastline, sometimes with cliffs, with narrow sand and shingle beaches, and mud flats in estuarine locations.*
- *Varied land uses but mainly farmed; the raised beaches also provide a level terrace for settlement and communication.*
- *Large parts of the former cliff line are also characterised by dense, often wind sheared broadleaf woodland.*
- *A number of hillforts, promontory forts, mottes and castles reflecting the strategic importance of this coastal landscape.*
- *Small, historic settlements sit comfortably against the steep former cliff line and use building materials which reflect the local geology.*
- *Some modern growth has taken the form of ribbon development and includes caravan parks and holiday development; tall structures such as masts are relatively few.*
- *Landscape of visual drama and contrast with a strong sense of seclusion, and where less accessible a strong sense of remoteness.*
- *Views tend to be longer distance and focussed seaward."*

Other LCTs located in the study area of interest to the proposed development owing to proximity include:

- Landscape Character Type 61: Coastal Fringe with Agriculture.
- Landscape Character Type 80: Rugged Moorland Hills and Valleys.

The guidance lists the following as key characteristics of LCT 61: Coastal Fringe with Agriculture.

- *"Low lying coastal fringes.*
- *Varied geology with a variety of sedimentary, igneous and metamorphic rocks.*
- *Agricultural land use with improved pasture and mixed farmland all evident.*
- *Patterns of broadleaf woodland in this landscape closely reflecting the interplay of topography and exposure, together with human land uses.*
- *Contrasting settlement patterns on different islands. Larger settlements within these areas have experienced considerable growth recently with suburban housing developments pushing along the coast and uphill.*
- *Small scale rural character with a fine landscape grain. However, due to their coastal location they are quite exposed and strongly influenced by changing weather conditions.*
- *Views tend to be open, longer distance and focused out to sea towards the mainland and surrounding peninsulas."*

The guidance lists the following as key characteristics of LCT 80: Rugged Moorland Hills and Valleys.

- *"Series of rounded hills and moors rising to form a dissected plateau.*
- *Combination of comparatively gentle hills/ shallow slopes and steeper craggy escarpments.*
- *Exposed Red Sandstone dykes, sills and intrusions give the moorlands a degree of ruggedness.*
- *Land cover dominated by moorland vegetation, grading from heather and grass moorland, through rough grazing and abandoned pastures to improved pastures on the lower slopes.*
- *Higher moorlands have very extensive areas of coniferous forest.*
- *Field boundaries are marked by drystone dykes, post and wire fences and some hedges on lower slopes.*
- *Some Iron Age hut circles and hill forts occur within the hills and a line of castles mark the boundary with Garnock Valley.*
- *Modern development is generally scarce, comprising little more than a scatter of farmsteads.*
- *Tall structures (masts, pylons and turbines) are beginning to erode some of the characteristics of remoteness from certain areas.*
- *Where woodland does not foreshorten views they tend to be long distance and panoramic, focused towards the islands and peninsulas in the Firth of Clyde and Kilbrannan Sound."*

71 Land Use Consultants (1998) Ayrshire landscape assessment

72 NatureScot (2019) Available at: https://www.arcgis.com/apps/webappviewer/index.html?id=e3b4fbb9fc504cc4abd04e1ebc891d4e&extent=-2030551.0017%2C6851563.2052%2C1100309.6769%2C8923312.4198%2C102100 (Accessed: December 2023)

Designated landscapes and wild land areas

A landscape designation is an area of landscape identified as being of importance at international, national, or local level. Landscapes are designated in relation to their special qualities or features which warrant special consideration through the planning system.

According to the LDP, there are no statutory or non-statutory landscape-led planning designations covering the application site (see Figure 6.2: Designated Landscapes and Recreational Routes).

International, national, and local designations within 5km of the proposed development have been identified on Figure 6.2, with Figure 6.5: Bareground Zone of Theoretical Visibility with Designated Landscapes and Recreational Routes illustrating the ZTV for the proposed development overlaid over the designations. The most notable designations are the Mainland SLA, the Great Cumbrae SLA, the Little Cumbrae SLA, Kelburn Castle GDL, and the non-Inventory listed designed landscape at Hunterston Castle.

The ways in which these designations are relevant to the SLVIA are:

- Their presence can give an indication of a recognised value that may increase the sensitivity of a landscape character receptor, viewpoint, or visual receptor, therefore affecting the significance of the effect on that receptor;
- Their presence can lead to the selection of a representative viewpoint within the designated area, as the viewpoint would provide a representative outlook from that area; and
- The designated area may be included as a landscape character receptor with effects from the proposed development on the features accorded particular value specifically assessed.

6.5.3 Visual baseline overview

The ZTV is shown on Figure 6.3: Bareground Zone of Theoretical Visibility with Representative Viewpoint Locations.

The nature of the topography across the study area results in a relatively fragmented ZTV pattern.

Within approximately 5km of the application site, theoretical visibility of the proposed development would be relatively widespread; although, the topography of the Clyde Muirshiel hills (to the northeast) and Great Cumbrae (to the northwest) results in the greatest concentration occurring along the Fairlie Roads.

Actual visibility would be limited across settled areas of the coastline by intermittent residential and industrial development. Visibility from farmland areas within 5km of the proposed development would also be influenced by intervening areas of woodland, farm woodlands and shelterbelts, and by intermittent vegetation along transport corridors.

Zone of theoretical visibility limitations

The ZTV mapping relates to the bareground scenario, and therefore does not illustrate the potential screening effects of intervening built form, forestry, woodland, tree cover and vegetation across the study area. Actual visibility of the proposed development is also expected to be considerably influenced by industrial development in vicinity.

There are a number of areas within the ZTV display from which there is potential to view parts of the proposed development, but which comprise the Firth of Clyde, agricultural land, or private land where the general public do not appear to exercise regular access.

6.5.4 Overview of principal visual receptors

An overview of the key principal visual receptors in relation to the proposed development are outlined below.

Settlements

There are a number of properties in the settlement extents of Millport and Fairlie that lie within the study area. Also of interest are residents of Portencross, and West Kilbride as these also lie within a 5km radius of the proposed development.

It is worth stating that this assessment considers the outlook/visual amenity at residential properties as a way of assessing if the effect would be significant or not on the settlement as a whole, with consideration given in relation to public views and public visual amenity. No properties were visited, with assessments based on desktop studies and fieldwork from the nearest publicly accessible location, i.e., the road network.

Judgements on whether the proposed developments impacts on residential amenity are matters for a Residential Visual Amenity Assessment (RVAA) which is a stage beyond SLVIA as it focusses exclusively on private views and private visual amenity. As agreed with the variant consultees during the EIA Scoping stage of the proposed development, an RVAA has not been carried out, as it was agreed that the proposed development would not result in the Residential Visual Amenity Threshold being reached at any property in the study area.

Transport routes

There are a limited number of A-class, B-class, C-class, and minor roads within the study area.

Key routes of interest in relation to the proposed development include the A78; the B782; the B896, the B899, the B7048; Power Station Road and Oilrig Road. Rail passengers and travellers on the Ayrshire Coast Line are also of interest.

Notably, no marked ferry routes cross the study area.

Recreational routes

The primary long-distance recreational route in the study area is the Ayrshire Coastal Path.

Core path/public right of way network

According to the North Ayrshire Core Paths Plan[73], there are several core paths/Public Rights of Way in the study area. Of particular interest in relation to the proposed development are path routes NC1, NC34, NC36, NC60, and NC61.

Recreational destinations and visitor attractions

There are several discrete facilities for visitors in the study area. Of particular interest is Hunterston Castle, Glaid Stone Viewpoint, Lion Rock Viewpoint, Fairlie Viewpoint, and Portencross Castle and Harbour.

6.5.5 Overview of viewpoints

Nine representative viewpoint locations have been selected in consultation with the various consultees. Table 6-1 below lists the viewpoints and provides information on their location, the receptors which may experience views at these locations, grid reference, and viewpoint distance and direction from the proposed development. An overview

73 North Ayrshire Council (2009). North Ayrshire Core Paths Plan

of their location is shown on all SLVIA Figures, whilst their location is mapped at detailed scale on the visualisations prepared for each viewpoint (see Viewpoints 1 – 9).

Table 6-1: Representative Viewpoint Locations for Visual Assessment

VP	Viewpoint name	Grid reference	Approximate distance to proposed development (km)	Primary reasons for selection
1	Hunterston House	219200, 651772	0.53km SE	Recreational
2	Ayrshire Coastal Path at Inner Brigurd Point	218375, 651968	0.55km SW	Recreational / Road users
3	Fairlie Moor Road at Glenside Wood	221092, 652591	1.78km E	Road users
4	Lion Rock Viewpoint	217994, 654979	1.7km NNW	Recreational / Road users
5	Fairlie Viewpoint	220708, 654595	2.2km NE	Recreational / Residential
6	Pier Road, Fairlie Picnic Area	220679, 655899	3.3km NE	Recreational / Residential
7	Portencross Castle and Harbour	217558, 648926	3.45km SW	Recreational / Residential
8	Glaid Stone Viewpoint	216760, 657007	4.12km NW	Recreational
9	West Bay Road Millport	215575, 654347	3 km W	Residential

6.5.6 Cumulative developments

Introduction

As set out in GLVIA3, it can be difficult to appraise the combined effects of built development due to the ever-evolving development context, and the type of developments that should come under consideration:

"Agreement should also be reached about whether the cumulative effects assessment is to focus primarily on the additional effects of the main project under consideration, or upon the combined effects of all of the past, present and future proposals together with the new project. Some of those involved may tend to favour a limited view focused on the additional effects of the project being assessed, on top of the cumulative baseline. Some stakeholders may however be more interested in the combined effects of all the past, current and future proposals, including the proposed scheme. Again, discussion will be needed at the scoping stage with the competent authority and the consultation bodies about what can reasonably be expected, especially as assessing combined effects involving a range of different proposals at different stages in the planning process can be very complex. Furthermore, the assessor will not have assessed the other schemes and cannot therefore make a fully informed judgement. A more comprehensive overview of the cumulative effects must rest with the competent authority."

The general consideration of cumulative matters included in this SLVIA assesses the seascape, landscape and visual effects arising from the inclusion of the proposed development in the context of different baseline scenarios centred on existing and under construction developments, consented developments, and planning application stage developments.

What this assessment does not do is present an assessment of the combined effects of all the relevant developments on the landscape; as we do not have detailed information about each of the other projects that would allow a combined effects assessment to be presented.

Furthermore, we have limited detail of when the construction phase of each identified cumulative development would take place, or of its duration. For the purposes of assessment, the construction phases are therefore considered as occurring concurrently; however, in actuality they are unlikely to be undertaken at the same time.

Baseline developments

Industrial development is a long-established and familiar feature of the immediate and surrounding landscape context within the study area, forming part of the baseline conditions.

The deep waters of the Firth of Clyde have enabled access and encouraged development at Hunterston, with the power station comprising large infrastructure, including buildings, and other tall structures.

Consented development

In addition to existing developments or those under construction, there is potential for further change to the seascape, landscape and visual baseline as a result of consented developments due to be built.

The 'consented scenario' assumes that all consented stage developments have become operational and thus form part of a theoretical baseline situation that also includes the operational and under construction stage developments.

According to our research, consented developments located within the study area are limited to a small consented grid stability facility at the former Hunterston Coal Terminal (a small site located just to the north of the eastern end of the proposed access road).

Planning application stage scenario

In addition to baseline developments and those consented, there is potential for further change to the seascape, landscape and visual baseline as a result of further built developments with validated planning applications.

The 'planning application stage scenario' assumes that all appeal/planning application stage developments have become operational and thus form part of a theoretical baseline situation that also includes the baseline and consented developments.

According to scoping stage consultation responses (including from NatureScot who listed several developments) and our research, certain planning application stage developments, such as the Bakkafrost aquaculture facility, Fastrig demonstration project, and the XLCC submarine cable factory may be visible in localised views. It is noted however that Fastrig only has a temporary planning permission so in terms of potential impact the test sail will have been removed well in advance of the proposed development.

6.5.7 Future baseline conditions

If the application site were not to be developed to accommodate the proposed development, the land would largely remain in its present condition over the short-term.

There is high probability of changes in land-use over the medium and longer term as both NPF4 and the LDP show that the application site currently lies in an area allocated for industrial development, suggesting that the Scottish

Government and NAC considers Hunterston to have the potential to be developed in the future on a permanent basis.

Coastlines are also recognised as being highly vulnerable to the impacts of climate change, which could result in coastal settlements and low-lying areas along the hinterland of the west coast of Scotland being subjective to flooding. In response, there is prospect that the coastline and the nearby water courses would be altered or changed to accommodate engineered and/or other flood prevention measures.

Other pressures that may cause change in the baseline seascape, landscape and visual context in the future include built developments that are not yet present in the landscape, transport corridors, onshore and offshore renewables, overhead lines, and potential settlement expansion.

When considering the above, and the Government's targets to rebuild the economy post-COVID, with plans to drive down carbon emissions in response to the climate crisis there is likely to be increasing pressure for new infrastructure, industrial and/or renewable-led developments to be accommodated at or near existing large-scale industrial development sites such as at Hunterston Construction Yard. It is therefore fair to assume that the application site would come under pressure to accommodate some form of built development in the future.

6.6 Impact Assessment

There are several ways in which the proposed development may affect the existing seascape, landscape and visual characteristics found within the study area.

Potential seascape, landscape and visual effects that could result from the construction of the proposed development are presented in Table 6-2 below.

Table 6-2: Potential Effects

Phase	Element	Potential effects	Potential sensitive receptors
Construction	Demolition works of existing structures and built elements Land reclamation, removal of existing land, and dredging activities Infilling of the existing dry dock basin Temporary construction facilities including compound, assembly, and laydown areas Material stock piles Construction plant and machinery Presence of cranes Introduction of lighting (currently anticipated to be tall mast lighting columns along the new quayside with lower lighting elsewhere and along the access toad) Introduction of 3m high site perimeter fencing including along the access road. Construction of built elements including any activities associated with ground preparation; ground improvement works; securement of the construction area; marking out; or the laying of pipes and cables Vehicle and shipping movements	Temporary physical effects on landscape fabric Permanent physical effects on landscape fabric (i.e., permanent changes to ground cover) Temporary effects on seascape and landscape character Temporary effects on views Temporary cumulative effects	Physical landscape features Seascape and landscape character receptors Visual receptors

Regarding Table 6-2, and the above descriptions, it is worth stating that identification of potential effects does not necessarily mean the effects would occur, or that they would be significant.

6.7 Mitigation and Monitoring

This section describes the seascape, landscape and visual mitigation measures incorporated into the final site layout.

This section covers seascape, landscape and visual measures only. The following should therefore be read in conjunction with the full project description provided in Chapter 2 (Proposed Development).

6.7.1 Site selection

The specific nature of the proposed development means that its design must principally respond to future operational and functional requirements.

Given the strategic economic and environmental advantages provided at Hunterston Construction Yard, the application site appears to be an appropriate location for the type of development proposed, with the industrialised coastline presenting an opportunity for the proposed development to be sited in a location where industrial development forms an established part of the baseline seascape, landscape and visual context.

The existing land uses on the application site, and in the immediate surrounds, also provides opportunity for the construction works to be experienced in the context of similar operational activities occurring in the immediate surrounds, which can provide visual continuity.

6.7.2 Layout design

The biggest contribution to mitigate potential seascape, landscape and visual effects can be made during the layout design process.

As it is unlikely to be possible to screen or otherwise reduce visibility of construction works and activities, or movements from vessels, vehicles, and construction plant and machinery, careful thought and consideration has been given towards:

- The extent of the application site boundary.
- The placement and height of the proposed 3m high perimeter fencing
- The placement and siting of temporary welfare facilities and laydown areas.
- The placement and height of lighting likely to be introduced during the construction phase (whilst the assessment adopts a worst case of up to 18no. 40m tall lighting masts it is currently anticipated that this will likely be reduced to fewer 30m high masts along the new quayside only with lower 20m lighting elsewhere)
- Construction traffic.
- Overall construction timescales.
- The maximum upper height limits of construction plant and machinery.
- The maximum dredge depth below sea level.

6.7.3 Seascape and landscape design suggestions

Specific mitigation measure suggestions to minimise the potential impact during the construction phase include:

- Limiting land and sea clearance and occupation to the minimum necessary to complete the works.
- Ensuring that temporary warning signs and other road safety management measures on public roads are established in an orderly and well organised manner that achieves the necessary safety management objectives with minimal landscape intrusion.
- Removal of temporary construction materials from the application site once work is completed.
- Regular maintenance of working compounds to ensure they are kept tidy and contained, with mud etc. controlled upon public roads.

The above could be included within a Construction Environment Management Plan to be agreed as part of a suitably worded condition.

6.7.4 Enhancement opportunities

Given the location of the application site, it is acknowledged that traditional enhancement methods, such as the promotion of new tree planting, are unlikely to be effective as soil and climactic conditions suggest that new tree planting may be difficult to establish.

There may however be opportunity to incorporate some small tree or shrub planting along the proposed access road, or to improve the biodiversity value of grasslands found in the application site boundary.

6.8 Residual Effects

From a seascape, landscape and visual amenity perspective, there is limited opportunity to mitigate any potential effects beyond the mitigation measures built into the final site layout during the design process. There are therefore no additional mitigation measures to be considered in the SLVIA, with effects attributable to the proposed development considered as the residual effects (i.e., those which remain after mitigation).

The potential residual effects attributable to the proposed development on seascape, landscape and visual receptors are assessed in the sections presented below. These are categorised into effects on seascape and landscape character, and effects on visual amenity.

Cumulative effects are also considered in these sections in general terms.

6.8.1 Assessment of effects on seascape and landscape character

Introduction

The first category of effects covered in the assessment is potential effects on seascape and landscape character.

Landscape character is the distinct and recognisable pattern of features that occurs consistently in a particular type of landscape, and the way in which this pattern is perceived. Effects on landscape character can occur both onsite, where the pattern of features that characterise the landscape would be directly altered by the proposed development; and offsite, where visibility of the proposed development may alter the way in which recognisable patterns are perceived in the study area.

In addition to the assessment of effects on landscape character, this SLVIA also includes an assessment of effects on the coastal landscapes and seascapes found in the study area.

It should be noted that in this assessment, potential effects attributable to the proposed development are assessed with reference to their contribution to seascape and landscape character rather than in ecological or cultural heritage terms etc.

As agreed with the variant consultees, this assessment focusses on seascape and landscape character receptors located within a 5km radius of the proposed development.

Assessment stages

The starting point in identifying which of the seascape and landscape character typologies to be assessed in detail is to undertake an analysis of the ZTVs. Those character receptors that display no theoretical visibility of the proposed development are immediately discounted as there would be no potential for significant effects.

The next stage is to consider potential visual screening influences such as intervening built form, forestry, woodland, tree cover, and vegetation as well as viewing distances, as there would be limited potential for the proposed development to exert a level of influence that would create a defining seascape or landscape characteristic, and therefore a significant effect, when there is limited, restricted, or distant visibility of the proposed development.

The third stage is based on fieldwork, with site visits undertaken to preliminary appraise which of the seascape and landscape character receptors are likely to be influenced by the proposed development and have the potential to undergo significant effects, with those with no potential for significant effects not included in detailed assessment.

The final stage involves detailed assessment for the remaining seascape and landscape character receptors to establish whether they would experience significant or not significant effects.

6.8.2 Preliminary seascape character typologies assessment

Table 6-3 below presents the findings of a preliminary seascape character typologies assessment, identifying those that have the potential to undergo significant effects and require to be assessed in detail.

Table 6-3: Preliminary Seascape Character Typologies Assessment

Status: included for detailed assessment	
Coastal character area	Rationale
UFC8: Great or Big Cumbrae Island CCA	The proposed development would be apparent owing to the open and exposed nature from this section of the coastline.

UFC10: Little Cumbrae or Wee Cumbrae Island CCA	The proposed development would be apparent owing to the open and exposed nature from this section of the coastline.
Status: included for preliminary assessment but discounted from detailed assessment (no potential for significant effects)	
Coastal character area	Rationale
UFC5: Largs CCA	The ZTV shows concentrated theoretical visibility of the proposed development from this section of coastline. Across this section of coastline, the busy and urbanised character of Largs, is thought to reduce the sense of remoteness or inclusion. The curvature of the coastline combined with the presence of built form also often restricts or limits southerly views from the town. Where more expansive views are afforded, views tend to be focussed seawards, with Great Cumbrae, Little Cumbrae, Arran, and the Cowal Hills visible. At present, views towards the application site are largely hidden from view owing to topography, and built features and structures, including those at the marina on the southern extents of the town. From the coastline, it is therefore considered that the proposed construction works and activities would be barely discernible. As a result, the potential additional influence that the proposed development would exert on the characteristics of the coastline would not be significant.
UFC6: Largs to Goldenberry CCA	The ZTV shows concentrated theoretical visibility of the proposed development from this CCA, which covers the section of coastline covered by the application site boundary. At present, the application site comprises reclaimed land previously used for industrial purposes. On review, the bare earth, post-industrial nature of the application site and its immediate surroundings lies in contrast with more rural and wild coastal seascapes found elsewhere along the Firth of Clyde. As the construction activities would not result in a change in a material change in seascape character across this section of the coastline, effects at the application site are considered to be not significant. Across the wider extents of the CCA, the construction activities would change the perception of the application site and introduce discordant construction plant and machinery of scale into views. The site's location however ensures that the construction works and activities would be experienced along a section of the coastal edge already characterised by industrial built form and structures. With existing industrial built form and structures at the construction yard and power station providing contextual and visual integration; the potential influence that the proposed development would exert on the key characteristics of the CCA is therefore thought to be diminished to not significant levels.

UFC7: Goldenberry to Farland Head CCA	The ZTV shows concentrated theoretical visibility of the taller elements of the proposed development from this section of coastline. At present, views are primarily focussed seawards, with Great Cumbrae, Little Cumbrae, Bute, Arran, and Ailsa Craig all visible. Views to the Ayrshire mainland – including towards the application site - are largely hidden from view, owing to topography. From the coastline, it is therefore considered that the proposed construction works and activities would be barely discernible; with any visible elements experienced in the context of existing industrial built form and structures at the construction yard and power station. As a result, the potential additional influence that the proposed development would exert on the characteristics of the coastline would not be significant.
UFC9: Millport CCA	The ZTV shows concentrated theoretical visibility of the proposed development from this section of the coastline; although, visibility of ground-level built form, works, and activities would be restricted near Kames Bay. Across this section of coastline, the busy and urbanised character of Millport, reduces the sense of remoteness or inclusion. The curvature of the coastline combined with the presence of built form also often restricts or limits easterly views from the town. Where more expansive views are afforded, views tend to be focussed southwards towards Little Cumbrae and Arran; although, there is prospect to view the Ayrshire mainland and therefore the application site from the promenade at Millport Bay. In such views, the proposed construction works and activities would be visible. With existing industrial built form and structures at the construction yard and power station providing contextual and visual integration; the potential influence that the proposed development would exert on the key characteristics of the CCA is however thought to be diminished to not significant levels.
Status: discounted as limited/restricted or distant theoretical visibility (no potential for significant effects)	
Coastal character area	
N/A	
Status: discounted as no theoretical visibility (no potential for significant effects)	
Coastal character area	
LFC1: Farland Head to Ardrossan CCA	

6.8.3 Preliminary landscape character typologies assessment

Table 6-4 below presents the findings of a preliminary landscape character typologies assessment, identifying those that have the potential to undergo significant effects and require to be assessed in detail.

Table 6-4: Preliminary Landscape Character Typologies Assessment

Status: included for detailed assessment	
Landscape character type	
N/A	
Status: included for preliminary assessment but discounted from detailed assessment (no potential for significant effects)	
Landscape character type	Rationale

LCT 59: Raised Beach Coast and Cliffs	The application site is located in LCT 59: Raised Beach Coast and Cliffs. This LCT occurs in several areas in Ayrshire, covering parcels of land on the western coastal edge of the mainland, as well as the coastal edge of Arran. Within the context of the study area, the ZTV shows concentrated theoretical visibility of the proposed development from the LCT. At present, the application site comprises reclaimed land previously used for industrial purposes, which is considered as holding minimal landscape value. On review, the bare earth, post-industrial nature of the application site and its immediate surroundings are considered relatively uncharacteristic of the LCT, which does not list industry, infrastructure, or disused land as a key characteristic. As the construction activities would not result in a change in a material change in character, or result in the loss of any important landscape features, effects on the application site are considered to be not significant. Across the wider extents of the LCT, the construction activities would change the perception of the application site and introduce discordant construction plant and machinery into views. The site's location however ensures that the activities would be experienced along a section of the coastal edge already characterised by industrial built form and structures. With existing industrial built form and structures at the construction yard and power station providing contextual and visual integration; the potential influence that the proposed development would exert on the key characteristics of the LCT is therefore thought to be diminished to not significant levels.
LCT 61: Coastal Fringe with Agriculture	In the context of the study area, LCT 61: Coastal Fringe with Agriculture covers the island extents of Great Cumbrae and Little Cumbrae. The islands hold a close relationship with the coast and adjoining sea channel, with their landform profile commonly providing a backdrop in views from Fairlie Roads, as well as from many coastal roads, residencies, and recreational areas along the mainland coastline. The ZTV shows fragmented theoretical visibility of the proposed development from the islands, with potential visibility principally limited to the eastern coastlines. From such locations, the outlook is commonly open, providing opportunity for expansive and wide views. In such views, the focus is primarily on the sea and the islands of Arran and Bute. Whilst the construction activities would change the perception of the application site, and introduce discordant construction plant and machinery into views, the site's location ensures that the activities would be experienced along a section of the coastal edge already characterised by industrial built form and structures. With existing industrial built form and structures at the construction yard and power station providing contextual and visual integration; the potential influence that the proposed development would exert on the key characteristics of the LCT is therefore thought to be diminished to not significant levels.

LCT 80: Rugged Moorland Hills and Valleys	The ZTV shows fragmented theoretical visibility of the proposed development from this ZTV, with visibility largely concentrated to the summits and upper hillsides of moorland hills. From hill summits, the outlook would be expansive, with the proposed construction works and activities likely to be only slightly apparent as a background element when considering the presence of operational wind turbines on foreground hills, and intermittent appearance of urban development, transport infrastructure and industrial built form and structures in views. Whilst the construction activities would change the perception of the application site, and introduce discordant construction plant and machinery into views, the site's location ensures that the activities would be experienced along a section of the coastal edge already characterised by industrial built form and structures. With existing industrial built form and structures at the construction yard and power station providing contextual and visual integration; the potential influence that the proposed development would exert on the key characteristics of the LCT is therefore thought to be diminished to not significant levels.
Status: discounted as limited/restricted or distant theoretical visibility (no potential for significant effects)	
Landscape character type	
N/A	
Status: discounted as no theoretical visibility (no potential for significant effects)	
Landscape character type	
N/A	

6.8.4 Preliminary designated landscapes assessment

Table 6-5 below presents the findings of a preliminary designated landscapes assessment, identifying those that have the potential to undergo significant effects and require to be assessed in detail.

Table 6-5: Preliminary Designated Landscapes Assessment

Status: included for detailed assessment	
Designated landscape	
N/A	
Status: included for preliminary assessment but discounted from detailed assessment (no potential for significant effects)	
Designated landscape	Rationale
Mainland SLA Great Cumbrae SLA Little Cumbrae SLA	The Mainland SLA, the Great Cumbrae SLA, and the Little Cumbrae SLA each hold a close relationship with the coast and adjoining sea channels, with their landform profile commonly providing a backdrop in views from Fairlie Roads, the Firth of Clyde, as well as from many island and mainland roads, residencies, and nearby recreational areas. The SLAs each benefit from a lack of built development, which can provide a sense of isolation and remoteness on occasion; although, any perception of tranquillity is commonly influenced by the existing presence of settlement, transport corridors, wind turbines, and existing infrastructure in sightlines. The ZTV shows fragmented theoretical visibility of the proposed development from the SLAs, with potential visibility principally limited to elevated locations, and the eastern coastlines of the islands. From such locations, the outlook is commonly open, providing opportunity for expansive and wide views, where the focus is primarily on the sea and the islands of Arran and Bute; although, views towards the mainland are available. Whilst the construction activities would change the perception of the application site, and introduce discordant construction plant and machinery into views, the site's location ensures that the activities would be experienced along a section of the coastal edge already characterised by industrial built form and structures. With existing industrial built form and structures at the construction yard and power station providing contextual and visual integration; the potential influence that the proposed development would exert on the special qualities of each of the SLAs is therefore thought to be diminished to not significant levels.
Kelburn Castle GDL	The ZTV shows concentrated theoretical visibility of the proposed development from the estate at Kelburn Castle. At present, views from the grounds are largely visually restricted by estate woodlands and garden vegetation or foreshortened by surrounding built form in Fairlie and transport infrastructure. Where more expansive views are afforded, any visible elements of the proposed development would be barely perceptible in the context of existing industrial built form and structures at the construction yard and power station. As a result, the potential influence that the proposed development would exert on the key characteristics of the designation is therefore thought to be diminished to not significant levels.

Hunterston Castle estate	The ZTV shows concentrated theoretical visibility of the proposed development from the estate at Hunterston Castle. At present, views from the grounds are often restricted by estate woodlands and garden vegetation. Where more expansive views are afforded, the construction activities would change the perception of the application site, and introduce discordant construction plant and machinery into views. The site's location however ensures that the activities would be experienced along a section of the coastal edge already characterised by industrial built form and structures, which provides contextual and visual integration. As a result, the potential influence that the proposed development would exert on the key characteristics of the designation is therefore thought to be diminished to not significant levels.
Status: discounted as limited/restricted or distant theoretical visibility (no potential for significant effects)	
Designated landscape	
N/A	
Status: discounted as no theoretical visibility (no potential for significant effects)	
Designated landscape	
N/A	

6.8.5 Coastal character assessment

The preliminary assessment identified that a detailed assessment should be carried out for the following landscape character receptors (coastal character areas) as a result of potential effects from the proposed development:

- UFC8: Great or Big Cumbrae Island CCA
- UFC10: Little Cumbrae or Wee Cumbrae Island CCA.

UFC8: Great or Big Cumbrae Island CCA

The proposed new development is located southeast of Great Cumbrae Island's seascape character area, positioned on the opposite shoreline along the Largs to Goldenberry seascape character area and reveals a concentrated theoretical visibility. The visibility of construction works and activities would be restricted along the coastline facing Bute due to its curvature.

As the coastline is designated as a Special Landscape Area, the contrast between the rural undeveloped character of Great Cumbrae and the proposed industrial activity across the sea becomes more evident. The proposed development, featuring the erection of a platform accompanied by the presence of machinery, cranes, and 40-meter-tall lighting columns, would bring changes to the area's maritime and remote essence. The increased traffic of cargo ships and boats, as well as vehicle movements and ground-level activities, would contrast sharply with the baseline conditions of seclusion and tranquillity that define the character area.

Landscape receptors such as the overall character, stand to be affected slightly. The construction and completion of the development would disrupt the visual harmony of the coastline, but due to its distance from the coast and the existence of similar industrial activity at Hunterston Jetty, the effect is not drastic.

Due to industrial presence and inclusion of lighting columns, and the night-time dark skies experience, currently free from artificial light pollution, could be diminished. The rural, undeveloped nature of the landscape, which symbolise remoteness, is at odds with the proposed industrial activity. The proposed development would be visible, yet the existing industrial built form and structures at Hunterston Jetty and the power station offer a degree of visual integration.

Given the special landscape area designation and constraints identified for Great Cumbrae Island, the sensitivity of the landscape receptors to the proposed development is considered high. The island's coastline is distinguished by its irregular shape and remote nature, which are considered key constraints against the development of structures across. The introduction of taller structures as part of the proposed development would be more visually intrusive given these sensitive visual corridors. The south-eastern side of the island already has views to the infrastructures at Hunterston Jetty and Powerplant, additional development in this area would contribute to visual clutter.

The magnitude of landscape effect changes is considered medium. The size or scale of the proposed development, which includes the setting up of up to 40m tall columns and the associated infrastructure for maritime activities, would not change to the seascape elements but would change the aesthetic and perceptual aspect of the character area. As the proposed development lies in the immediate setting of the coastline, the effects would still be significant due to the visibility of the tall structures and the alteration of the skyline. The duration of the landscape effects would likely be long-term. This assessment of the absence of change to seascape elements would also be true for the marine works including the rubble mound sloping revetment that will be replaced by a steel pile vertical quay wall and possibly mooring dolphins.

The overall significance of the landscape effect due to the proposed development across the shore from Great Cumbrae Island is considered moderate. This is based on the high sensitivity of the landscape receptors, and the medium magnitude of change that the development is expected to bring to the seascape character.

The proposed development of industrial structures and machinery integrates with the existing industrial backdrop existing in Hunterston Powerplant and jetty. Thus, the proposed development would bring slight changes to the character, but these changes do not completely transform the seascape character.

UFC10: Little Cumbrae or Wee Cumbrae Island CCA

The proposed development on the north-eastern shore, opposite Little Cumbrae would slightly alter the island's current seascape character. The industrial nature of this development would contrast the seclusion and unspoiled maritime character that defines Little Cumbrae, its impact is considered to be moderate rather than severe.

The proposed development shares some characteristics with the existing industrial activities at Hunterston power station and Jetty, yet it is distinguished by the large scale and the height of its structures, which could potentially overshadow the low-lying profile of the island. During both construction and after completion, the proposed development is expected to cause a slight disruption in the visual harmony of the island. The aesthetic experience would be altered by the new lighting columns, increasing light pollution to a predominantly remote setting. Despite the visual integration offered by the industrial backdrop of Hunterston, the proposed development's larger scale infrastructure and the increased traffic of ships and boats would be noticeable, making a change in the key characteristics of the CCA.

The new development, while reflecting some aspects of the adjacent industrial landscape, would still moderately influence the seascape character of Little Cumbrae due to its scale and the introduction of visually prominent features.

As Little Cumbrae Island is designated as special landscape area, the sensitivity of the landscape receptors to the proposed development is considered high. The island's remote largely undeveloped nature, form key constraints against the introduction of industrial structures across the shore. The prospect of taller structures as part of the proposed development would cause visual intrusion. These would likely disrupt the existing low-rise profile of the

coast and stand in stark contrast to the rural character of the seascape. Although the eastern side of the island is close to the existing infrastructures at Hunterston, which includes a jetty and a power plant, any additional development could cause visual clutter in the area. The cumulative effect of the proposed development, especially its scale and introduction of taller elements, would change the visual landscape that currently exists.

The magnitude of landscape effect changes due to the proposed development across the shore from Little Cumbrae can be considered medium. This is based on the size or scale of the development, its geographical extent, and the duration and reversibility of its effects. The development's introduction of 40m tall columns and associated maritime infrastructure alters the aesthetic and perceptual aspects of the seascape character. The development's scale is substantial, but it does not entirely replace the seascape's existing character. The landscape effects are likely to be long-term, but the new elements become part of the broader industrial backdrop already present due to Hunterston's existing facilities.

The overall significance of the landscape effect due to the proposed development across the shore from Little Cumbrae is considered moderate. This is based on the high sensitivity of the landscape receptors, and the medium magnitude of change on the landscape introduced by the development.

The proposed development of industrial structures and machinery integrates with the existing industrial backdrop existing in Hunterston. Thus, the proposed development would bring slight changes to the character, but these changes do not completely transform the seascape character.

6.8.6 Assessment of effects on views

Introduction

Visual effects are described as the changes to views as experienced by people that result from the proposed development. As described in the baseline overview, the assessment of effects on views includes effects on principal visual receptors (i.e., groups of people in settlements, road users, users of recreational routes, etc) and on people at representative viewpoints.

This section focusses on visual receptors and viewpoints within a 5km radius of the proposed development, as agreed with the various consultees. Detailed assessment of representative viewpoints

Viewpoint 1: Hunterston House

This viewpoint is situated in proximity to Hunterston House, lying to the southeast of the proposed development site. The topography of the viewpoint is characterized by flat pastureland, with gentle undulations that subtly direct the view towards the development site and offer glimpses of the sea.

From this viewpoint, the existing view is a mix of man-made elements, hills and woodlands. The view is framed by trees on either side, with few trees obstructing the view. The proposed development site appears closer and stretches towards the sea. The foreground is characterized by pastureland that leads the eye toward the sea and the development site, with hills as the backdrop in the distance. The visual scale and proportion of the landscape is expansive. Hunterston Jetty is also visible in the distance, but it is not visually prominent and blends with the horizon line of the sea. The proposed site view is influenced by the shrubs along the edge of the site, which screen the development site and the coastal boundary and block view into the site.

The type of visual receptors includes workers to the power station and visitors to Hunterston Sands. The activities engaged by these receptors largely relate commuting and enjoying of the coastal landscape.

During the construction phase the site would be visible from this viewpoint. The natural vegetation that previously offered a partial screen would be cleared, allowing for full views of the construction activities and progress. From the viewpoint, most of the development would be visible, particularly the up to 40-meter lighting columns which would stand out against the existing landscape. While the machinery and construction operations may occupy a smaller portion of the view, these lighting columns would be a prominent feature, especially at night. The proposed 3m high perimeter fencing around all of the site including the access road would in parts be visible in this view but would not be prominent and would not interrupt the long views to the mountains to the north.

After the construction period the proposed development, which is situated at a moderate distance from Hunterston House, may cause the viewer to focus on it due to its scale and the introduction of vertical elements. The construction would noticeably change the existing skyline by adding new vertical elements that contrast with the horizontal emphasis of the seascape and flat pastureland.

The visual effects of the development would vary seasonally. During spring the tree foliage would provide a degree of screening, softening the visual impact. Conversely, in autumn, the development would be more exposed and visually prominent, with less natural filtering.

The overall visual effect of the development during construction is likely to be negative in terms of altering the quality of the view from Hunterston House. The introduction of industrial elements disrupts the existing visual harmony and potentially affects the visual experience of the receptors. The view is largely prominent for commuters and visitors passing by.

The sensitivity of the viewpoint is considered as high due to its location within a locally listed historic landscape, which suggests that the visual receptors have a significant interest in the view.

The magnitude of visual change from the viewpoint near Hunterston House is considered to be High. This is due to the size and scale of the proposed development, which includes the addition of 40-meter lighting columns that would introduce a striking contrast and a prominent new feature within the view. The development's visibility extends over a wide area, impacting a large portion of the view from the viewpoint. The introduction of industrial structures would be a long-term change to the landscape, while some aspects may be reversible over an extended period.

The overall level of effect on the visual receptors at this viewpoint would be Major due to the high sensitivity of the receptors who value the historical landscape with less manmade structures, combined with the high magnitude of visual change introduced by the features of the proposed development.

Viewpoint 2: Ayrshire Coastal Path at Inner Brigurd Point

The viewpoint is located southwest of the proposed development site, along the Power Station Road, and features a vast, open view with no interruptions. The topography is characterized by a flat terrain that gently slopes towards the sea, with tall grasses and shrubs defining the immediate view.

From this position, observers can view of the sweeping coastal landscape. The proposed development site is subtly framed by natural elements such as shrubs and rocks that create a soft edge against the more distant backdrop of rolling hills and coniferous trees. This allows the site to integrate subtly, with the surroundings. The view is characterized by the vastness of the sea, with hills at a distant horizon. The skyline is largely defined by the natural contour of the hills, while the sea provides a horizontal character. Elements that shape the current view include the natural vegetation in foreground, which doesn’t block the openness of the sea. There are no prominent built structures within the immediate view and man-made influence is minimal and only faintly visible.

The primary visual receptors are people working or visiting the Power Station and those who frequent Hunterston Sands. The value of the view for these receptors lies in its expansiveness and the minimal presence of man-made structures.

From Viewpoint 2, the proposed development during its construction would present a noticeable change within the expansive, open view characterized by less man-made structures. The introduction of construction machinery,

including cranes and trucks, would transform the coastal edge to an active construction area. Observers from this viewpoint would have a clear view of the construction activities, with the open landscape offering full visibility to the changes occurring on the site. The proposed 3m high perimeter fencing around all of the site including the access road would in parts be theoretically visible in this view but would be too distant to make a noticeable visual change, especially in the context of the backdrop of high hills.

After the construction, while the proposed development is distant from this viewpoint, its scale and the introduction of 40-meter lighting columns would draw the viewer's attention. The vertical columns would contrast the horizontal expanse and undeveloped environment, becoming a new feature within the view. The view is experienced as stationary by those stopping to take in the scenery and as transient by those commuting along the coastal path.

Seasonal variations in vegetation in foreground may offer some degree of visual filtering, but the 40-meter lighting columns would remain a prominent feature regardless of the season, due to their height and vertical prominence.

Visual Effect: The visual effect of the proposed development during construction is largely negative in terms of altering the view's quality. Despite the distance, the vertical structures would create a new and prominent visual element within the natural landscape, significantly changing the view's previously expansive and horizontal character.

The sensitivity of the viewpoint is considered as Medium because, although visitors to the power station and Hunterston Sands see the view, their interaction with the view is typically transient and not as prolonged as those at a residential setting. the value attached to the view is less.

The magnitude of visual change at viewpoint 2 would be High. This is because the proposed development introduces prominent new structures, such as the 40-meter lighting columns, which would alter the characteristics of existing view to one filled with industrial elements. The development would affect a wide visual area due to its unobstructed visibility from the path. The visual effects are expected to be long-term and not easily reversible.

The overall level of effect would be Moderate, due to the medium sensitivity of the observers who value the open and natural views even though there is a high magnitude of visual change due to the construction of the new structures within a previously minimally developed environment.

Viewpoint 3: Fairlie Moor Road at Glenside Wood

The viewpoint is located on the Fairlie Glen Circular Walk, positioned east of the proposed development site. Located on a hill, it is elevated, and gives extensive views of the sea and the outlines of the surrounding islands, with the town of Millport faintly dotting the coast of Great Cumbrae in the distance. The Hunterston Power Plant is noticeable to the west, and the Hunterston Jetty lies to the east, framing the sides of the view. The top of the hill serves as an excellent vantage point, granting unobstructed views across to the site. The proposed site has an almost barren appearance, encircled by water on three sides, with the landmass connecting it to the mainland on the western end.

Hedgerows and shrubs in the foreground provide minimal visual interruption, and the flat barren land before the sea features some construction materials. The Hunterston Power Plant and Jetty are the main man-made structures, but they are on the edges and do not dominate the view.

The primary visual receptors are hikers utilizing the circular walk for recreation and motorists who might stop to enjoy the view. They engage with this location for its natural beauty and the expansive views it offers.

From the viewpoint, during its construction, the proposed development would become increasingly prominent as receptors move down the hill. The presence of construction machinery such as cranes and trucks would contrast sharply with the existing view, making the construction phase distinctly visible. The entire construction phase, including most of the development's features after construction, would be visible from this elevated vantage point, with the 40-meter lighting columns likely to be particularly visible. Despite the site being at some distance from the viewpoint, its central positioning and the introduction of significant vertical elements would create a notable change.

The proposed 3m high perimeter fencing around all of the site including the access road would in parts be theoretically visible in this view but would be too distant to make a noticeable visual change, especially in the context of the panoramic and long distance backdrop.

The view is both stationary for those who stop to enjoy the scenery and transient for those passing by, such as hikers on the circular walk or motorists on the road. The development would create a new visual focus, introducing manmade objects that would stand in stark contrast to the natural elements, altering the existing skyline profile, and increasing the visual complexity of the area.

Seasonal vegetation does not offer screening, and the lighting columns would remain a significant visual element throughout the year due to their height and verticality. The visual effect of the proposed development during construction would be negative, as it would change the quality of the view signalling the presence of human activity within a predominantly undeveloped setting.

The sensitivity of the viewpoint is considered as High because the viewpoint is part of a valued recreational walking route where visitors are engaged in enjoying the scenery, indicating a strong susceptibility of visual receptors to change.

The magnitude of visual change would be High. This is due to the scale of the proposed development, which includes tall columns that would introduce a new vertical element to the view. These structures would contrast sharply with the existing view. The geographical extent of the change would be considerable, as the development would be visible from a key recreational route and the changes are likely to be long-term.

The overall level of effect on the visual receptors would be Major, because of the high sensitivity of the receptors, and high magnitude of visual change introduced by the proposed development.

Viewpoint 4: Lion Rock Viewpoint

Lion Rock Viewpoint is located to the northwest of proposed development site on the island of Great Cumbrae. The viewpoint provides expansive, clear, and uninterrupted views across the water, characterized by a vast rural setting with few industrial influences.

The topography at the viewpoint is primarily flat, with gentle undulations leading towards the sea with rocks bordering them, which enhances the sense of openness and unobstructed line of sight. There are few benches present with tufts of grasses surrounding them. The skyline across the water from Lion Rock Viewpoint is defined by the distant hills, pasturelands, and woodlands. Wind turbines are visible on top of one of the hills, but these aren’t prominent due to their distance from the viewpoint. The Hunterston Power Station to the east and the Hunterston Jetty to the west are the prominent industrial features, set on either side against the open view.

The visual receptors are mainly hikers, picnic goers, and motorists travelling to Millport who are likely to value the scenic qualities of the view. They are engaged in leisure activities, placing importance on the aesthetic value of the landscape.

The proposed development would be prominently visible during its construction phase, as there are no obstructions to screen the view towards the site. Observers would witness a full view of the construction activities including cranes, trucks, and other machinery.

Most of the construction activities and emerging features of the development would be clearly seen, although the development would form a part of the wider industrial backdrop. While the development is at a distance from the viewpoint, the scale and proximity of the construction activities, especially the erection of 40-meter lighting columns, would draw the viewer's attention, making it a significant element within the view. As the site lies adjacent to the Hunterston Power Plant, the new development would appear as an extension of the power plant. The site appears further behind compared to Hunterston Jetty, and hence, once constructed, besides the tall lighting column, the

proposed development is not as prominent as Hunterston Jetty. The proposed 3m high perimeter fencing around all of the site including the access road would be indiscernible at this distance.

The view is stationary for visitors who stop to take in the scenery and transient for those on the move, such as pedestrians or road users traveling towards Millport.

After construction the development would introduce changes in the skyline, adding new vertical elements that contrast with the existing horizontal lines. Vegetation does not play a significant role in this viewpoint, so seasonal changes would have a minimal effect on the degree of visual screening.

The sensitivity of the viewpoint is considered as be High because it is a promoted viewpoint where people are specifically encouraged to visit for the purpose of enjoying and valuing the scenic views, indicating a high level of public interest and value attached to the visual experience.

The magnitude of visual change at Lion Rock Viewpoint would be Medium. These changes would create a degree of contrast to the existing view, even though it would appear as an extension to the industrial activity of Hunterston Power plant. The development, visible over a large geographical area and its effects are likely to be long-term and not easily reversible.

The overall level of effect on the visual receptors at Lion Rock Viewpoint would be Moderate, due to the high sensitivity of the viewers at this promoted viewpoint and the high magnitude of visual, which would significantly alter the existing valued scenic view.

Viewpoint 5: Fairlie Viewpoint

Fairlie viewpoint is a small local park and prompted viewpoint located to the northeast of the construction site, providing a peaceful setting for residents and tourists to enjoy views of the sea. It is situated on a flat expanse, with a natural rocky edge bordering the sea and directs viewers' attention towards the water and views across. The view from this viewpoint is defined by its openness, with the sea playing a dominant role in the visual experience. The flat terrain allows for expansive views across the sea to Great Cumbrae Island and the distant hills, with the horizon line gently interrupted by the Hunterston Jetty. The view is characterized by its vast scale and the Jetty's minimal impact on the overall visual perception due to its distance. The vast openness of the sea and the distant island preserve the aesthetics of the area, with only the upper portions of the raised land behind the Jetty visible. On the west side, sloped terrain and coniferous trees screen views beyond, while Little Cumbrae Island and faint outlines of hills are visible behind the Jetty. The Hunterston Jetty itself, with its industrial elements like cranes and tractors, is the only manmade interruption, and its effects are minimal due to their distance. The visual receptors are mainly hikers, picnic goers and residents.

During the construction phase of the proposed development, the visual impact would be relatively subdued due to the natural screening provided by the coniferous trees and the sloping terrain that block the views. The proposed development would be seen partially and intermittently, with the majority being obscured by vegetation and landform, offering just glimpses of the construction phase.

Only a small part of the development, including the tallest structures like the 40-meter lighting columns, would be visible from this viewpoint, blending with the industrial features of the Hunterston Jetty in front. After construction, the proposed development is at a distance and partially hidden, which means that while it may capture some attention due to some vertical light columns, it would remain a minor element in the panoramic view. The proposed 3m high perimeter fencing around all of the site including the access road would not be visible from this viewpoint.

The view is stationary, as it serves as a place where visitors come to rest and enjoy the scenery, rather than a transient view experienced on the move. The change to the existing skyline profile would be minimal; the new development would introduce additional manmade objects, but these would not significantly increase the visual complexity or alter the scale of the view.

The seasonal variation in foliage may provide more or less screening of the development but given its distance and the Hunterston Jetty present in front with existing industrial activities, the effect is likely to remain consistent throughout the year.

The sensitivity of the viewpoint is considered as High because it is a local park where people, including residents and tourists, visit to enjoy the views, indicating a strong value and importance attributed to the visual experience of this location.

The magnitude of visual change at the viewpoint would be Low. Despite the introduction of new elements like the 40-meter lighting columns, the natural screening from trees and sloping terrain means that the development would only be partially visible, resulting in a limited degree of change to the overall character and quality of the view.

The overall level of effect on the visual receptors at the Fairlie viewpoint would be Minor, due to the High sensitivity of the visual receptors and the Low magnitude of visual change, as the proposed development is distant and largely screened by natural vegetation, resulting in only minimal alterations to the existing view.

Viewpoint 6: Pier Road, Fairlie Picnic Area

The viewpoint at the Fairlie picnic area is located to the northeast of the proposed development site, offering visitors an open setting to enjoy the sea views. The existing view encompasses a vast, open stretch of sea that meets the land at the horizon. To the west, the village of Fairlie is visible with residential buildings set against a backdrop of hills. To the east, the distant outline of Little Cumbrae Island provides a point of interest, with glimpses of the shoreline of Great Cumbrae Island.

The view is characterized by its openness and the expansive sea view, which dominates the visual experience. The horizon is defined by the faint, distant outline of hills and the more prominent features of the land bounding the seashore on the west. The Hunterston Jetty and the Hunterston power plant are visible in distant central focus of the view, but not prominent due to their distance. The Hunterston jetty screens the view to the proposed development site. The power plant, while is located behind the jetty, appears as small structures due to its distance.

The main visual receptors are visitors and picnickers who frequent the area to experience and appreciate the panoramic views of the sea. The current visual effect is characterized by the expansive sea view, with residential buildings on the west and the industrial elements of the jetty and power plant present in distance along the horizon line of the sea.

During the construction phase, the proposed development would integrate with the ongoing industrial activities of the Hunterston Jetty in front, resulting in a view that is only partially altered. After construction the proposed development would be seen from the viewpoint as a continuation of existing industrial activities. The development site, situated behind Hunterston Jetty and at a distance, would not be a focal point for viewers due to its scale and proximity; it would appear as a minor element in the panoramic view. Most of the construction activities would blend with the backdrop of the power plant, and the change would not be prominent until the installation of the 40-meter lighting columns, which would introduce a new vertical element to the horizon. The proposed 3m high perimeter fencing around all of the site including the access road would not be visible from this viewpoint.

The view from this location is stationary, as it is experienced from a fixed picnic area where visitors stop to enjoy the sea view. The development would initially blend with the existing industrial scene but would eventually change the skyline profile by adding verticality. The lighting columns, once erected, would be more evident against the horizontal elements of the jetty.

Coniferous trees on the west side in front of the proposed development would screen the development throughout the year, while in the central and eastern parts, the existing industrial backdrops would minimize the visual impact of the construction. The visual effect during construction would be neutral, as the activities would not distinctly stand out from the existing industrial context. However, the post-construction addition of the lighting columns would create

a more noticeable change. This change would be seen as an addition to the existing industrial features along the coastline.

The sensitivity of the viewpoint is considered as High because it is a designated recreational space where visitors, including tourists and locals, come specifically to enjoy the sea views.

The magnitude of visual change from the viewpoint at the Fairlie picnic area is considered as Low. Due to their integration with the Hunterston Jetty and power plant, the contrast would be moderate, and they would not greatly alter the form, scale, or texture of the existing view. The distance of the viewpoint from the proposed development result in a limited extent of area where the change is visible. The visual effects are long-term due to the permanent nature; however the changes do not drastically alter the key characteristics of the current view.

The overall level of effect on the visual receptors at the Fairlie picnic area viewpoint would be Minor, because while the receptors have a high sensitivity to changes, the magnitude of visual change is low, with the development being partially visible and not significantly altering the existing character of the view.

Viewpoint 7: Portencross Castle and Harbour

The viewpoint is situated on Portencross Pier, located southwest of the proposed site. From this viewpoint, observers can see the vast expanse of open sea, with the coastline and cliffs framing the view to the east.

The visual character is defined by the horizontal expanse of the sea and vast open views, with the faint distant hills along the horizon of the sea. Natural landforms such as the Three Sisters hill act as a visual barrier, blocking any direct view of the proposed site. Vegetation and the topography of the cliffs contribute to the framing of the view on east and help maintain the area's rural, undeveloped character.

The visual receptors are the number of people who frequent the pier for recreation, including hiking, photography, and sightseeing. The activities they are involved in are generally leisure-based, with a focus on enjoying the uninterrupted natural views, making them sensitive to any changes in the visual environment.

From the viewpoint during and after the construction phase of the proposed development, there would be no visual change to the existing seascape as the site is entirely blocked by the Three Sisters hill. None of the development or its features would be visible from this viewpoint.

The view from the pier is stationary, experienced by those spending time at the location rather than passing by. But there would be no change to the existing skyline or view from this viewpoint because the development is not visible.

The sensitivity of the viewpoint is considered as High, as it is a location frequented by visitors and locals for leisure and recreation, where they have a significant interest in preserving the scenic qualities of the expansive sea views.

The magnitude of visual change from the Portencross Pier viewpoint would be Low, as the proposed development is completely hidden by the Three Sisters hill and would not introduce any new features to the view.

The overall level of effect on the visual receptors at the Portencross Pier viewpoint would be Negligible because, despite the high sensitivity of the receptors, the proposed development is completely hidden by natural landforms, resulting in no change to the current view.

Viewpoint 8: Glaid Stone Viewpoint

Glaid Stone viewpoint is situated on top of a hill on the island of Great Cumbrae, northwest of the proposed development site. The elevated position offers expansive open views, though the surrounding rolling slopes and vegetation of the hill screens the view.

The viewpoint is characterized by rural, undulating terrain covered with heather and bracken, and is largely devoid of man-made structures. From the viewpoint the observer can predominantly see the elements of the hill such as sloping landforms, diverse vegetation such as heather, bracken and trees and a water body. Across the sea towards Largs, hilltops and the faint silhouettes of wind turbines and village settlements can be seen, although these features are subtle and not immediately striking due to their distance from the viewpoint. The Hunterston power station located across the sea on the east is more noticeable but not prominent in the overall view. Landforms and trees of the hill, where the viewpoint is located act as filters, screening views beyond the immediate vicinity and blocking views of the shoreline across.

The main receptors are the hikers and motorists who visit for the views and the rural setting.

From the viewpoint during the proposed development's construction phase, the visual impact would be hardly visible due to the view being blocked by the hill’s landform.

Only glimpses, of the development, specifically the upper sections of the 40-meter lighting columns. would be visible upon completion, as most views of the development site is blocked by a mound on the hill. The development lies at a distance from the viewpoint, and due to the natural screening, the industrial elements are not a point of focus for observers. The minor visibility of the lighting columns would blend with the existing industrial backdrop of the power plant, without altering the view's key characteristics. The proposed 3m high perimeter fencing around all of the site including the access road would not be visible from this viewpoint.

The view is stationary for hikers and transient for motorists. Visibility of construction site and the power plant would likely be diminished during spring, as the foliage of trees and vegetation grows, increasing the screening.

The sensitivity of the viewpoint is considered as Medium, as the receptors, primarily hikers and motorists, have an interest in the view due to the recreational and aesthetic values of the landscape; however, the natural screening and topography on viewpoint location reduce their visual exposure to changes across the sea.

The magnitude of visual change viewpoint is considered as Low, as the proposed development would result in only a minor addition of features that are largely concealed by the natural topography and vegetation, maintaining the existing character of the view.

The overall level of effect on the visual receptors at the viewpoint would be Minor, due to the medium sensitivity of the receptors and the low magnitude of visual change.

Viewpoint 9: West Bay Road Millport

The viewpoint is situated within the residential area of Millport on West Bay Road, located on the southern end of Great Cumbrae. The area is part of the town’s Conservation Area, and the viewpoint offers a view across the sea towards the site for both residents and visitors.

This viewpoint is located on a largely flat terrain, with grassy areas that extend towards the sea, allowing for an unobstructed view of the sea and the land beyond. The view is bounded by the Great Cumbrae coastline with settlements to the west, and by shrubs to the east, which frames the view. Minor elements such as shrubs, a container toilet to the west, and various rocks and bushes frame but do not obstruct the central view, ensuring a clear view to the proposed site. The skyline is defined by the presence of the Hunterston Power Plant to the east, set against a backdrop of rolling hills and wind turbines. While these features are visible, they do not dominate the view as much as the power plant, due to their distance. The central focus of the view covers the area of the proposed construction site, which currently consists of pastor lands, woodlands and undulating hills in the backdrop reflecting a rural character.

The visual receptors mainly consist of residents and visitors who are engaged in daily living and leisure activities within the Millport town.

From the viewpoint, during the construction phase of the proposed development, residents and visitors would experience a noticeable alteration in the view.

The central view, characterized by flat grassland, the sea, and the rural setting across, would witness a change with the introduction of man-made structures. Although the development is located across the sea, it would be slightly visible, with key features such as construction machinery, including cranes and trucks, becoming visible against the rural backdrop. The existing view would change with the introduction 40-meter lighting columns, which would add a new vertical visual focus and alter the view. The proposed 3m high perimeter fencing around all of the site including the access road would not be noticeable from this viewpoint due to its distance from the site.

The view is mainly stationary, experienced by residents and visitors living nearby or passing by on West Bay Road. As the view is unobstructed, the verticality of the lighting columns and new development would be visible throughout the year, regardless of seasonal changes. The proposed development would introduce industrial activities that would extend the existing character of the power plant, creating a continuous industrial presence within the main focus of the view.

The sensitivity of the viewpoint is considered as High. This is because the viewpoint is located within a residential area and conservation zone where residents and visitors have prolonged exposure and a strong connection to the view.

The magnitude of visual change is considered as High. This is due to the addition lighting columns and construction equipment that would alter the view when compared to the existing rural setting.

The overall level of effect on the visual receptors at Viewpoint 9 on West Bay Road in Millport would be Major, due to the high sensitivity of the receptors and the high magnitude of visual change due to the introduction of new structures within the undeveloped landscape.

6.8.7 Settlement assessment

Table 6-6 below presents the findings of a settlement assessment, identifying those that have the potential to undergo significant effects.

Table 6-6: Settlement Assessment

Settlement	Assessment
Fairlie Millport Portencross West Kilbride Largs	Each of these settlements display theoretical visibility of the proposed development to varying degrees. Landform, urban built form, and street/garden vegetation would visually restrict or impinge views of the proposed construction works and activities from many residencies, whilst orientation would often negate visibility from the principal outlook of many residencies. On the extents of the settlements there is theoretically greater prospect for unobstructed visibility of the proposed construction works and activities; although, in actuality, intervening woodland blocks, and intermittent incidences of transport infrastructure, and urban and industrial development would combine to restrict or impinge visibility, particularly of ground-level elements. Where views would not be obscured, taller elements may be visible; although, they would be viewed in the context of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes. There is expected to be only limited and sporadic occasions where the proposed development would be viewed from Fairlie, Millport, Portencross, West Kilbride, and Largs. Whilst there is the prospect for significant visual effects at specific locations where foreground elements permit unobstructed views, the limited prospect for frequent occurrences of the proposed development in views at similar distances limits the potential for significant effects at the settlements. Whilst none of the settlements listed are included in the detailed assessment, Viewpoint 5: Fairlie Viewpoint, Viewpoint 6: Pier Road, Fairlie Picnic Area, and Viewpoint 7: Portencross Castle and Harbour in the viewpoint assessment, considers the level of visibility against the baseline and cumulative context from variant static positions.

6.8.8 Transport route assessment

Table 6-7 below presents the findings of a transport route assessment, identifying those that have the potential to undergo significant effects.

Table 6-7: Transport Route Assessment

Transport route	Rationale
A78	The ZTV shows concentrated theoretical visibility from the A78. In the context of the study area, the route passes through various urbanised areas; where built form, street/garden vegetation, and structural woodland would combine to restrict visibility of the proposed development. As the route passes through coastal or rural areas, the expectation is that visibility of the proposed construction works and activities would largely be restricted at motorists' eye-level by intervening urban and industrial development, as well as by intermittent woodland blocks, farm woodlands, shelterbelts, and field boundary vegetation along the roads accessed; resulting in fleeting or glimpsed views at most, particularly when considering the varying speeds of travel adopted and the curvature of the routes. Where views would not be obscured, the proposed construction works and activities would be viewed momentarily and for short durations (and often at oblique angles to the primary direction of travel). Where seen, the works would be viewed in the context of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes. There is expected to be only limited and sporadic occasions where the proposed development would be viewed from the A78. Whilst there is the prospect for significant visual effects at specific locations where foreground elements permit unobstructed views, the limited prospect for frequent occurrences of the proposed development in sequential views limits the potential for significant effects.
B782	The ZTV shows concentrated theoretical visibility from the B782. As the B782 passes through West Kilbride; built form, street/garden vegetation, and structural woodland would combine to restrict or impinge visibility of the proposed construction works and activities. When the B782 routes through rural areas, the expectation is that visibility of the proposed construction works and activities would largely be restricted at motorists' eye-level by intermittent woodland blocks, farm woodlands, shelterbelts, and field boundary vegetation along the roads accessed; resulting in fleeting or glimpsed views at most. Where views would not be obscured, the proposed construction works and activities would be viewed momentarily and for short durations. Where seen, the works would be viewed in the context of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes. There is expected to be only limited and sporadic occasions where the proposed development would be viewed from the B782. In such instances, the proposed development would form a contextual feature with foreground visual influential factors such as electricity pylons more prominent and influential in available views, which diminishes the potential for the proposed development to result in significant effects.
B896	The ZTV shows fragmented theoretical visibility from the B896; although, notable visibility voids occur along sections of the route. As the B896 routes through Millport; built form, and street/garden vegetation, would combine to restrict or impinge visibility of the proposed development. When the route occupies coastal areas on the western extents of Great Cumbrae Island, there is greater prospect for unobstructed views of the proposed construction works and activities; although, the curvature of the route would commonly result in fleeting or glimpsed views at most (often at oblique angles to the primary direction of travel). Where seen, the proposed construction works and activities would be viewed in the context of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes. There is expected to be only limited and sporadic occasions where the proposed works would be viewed from the B896. Whilst there is the prospect for significant visual effects at specific locations, the limited prospect for frequent occurrences of the proposed development in sequential views limits the potential for significant effects.
Local road network	The ZTV shows concentrated theoretical visibility of the proposed development across the local road network, with the routes most likely to be affected being those lying in vicinity of the application site (excluding Power Station Road and Oilrig Road). As the routes pass through urban areas; built form, street/garden vegetation, and structural woodland would combine to restrict or impinge visibility of the proposed development. When the routes pass through coastal or rural areas, the expectation is that visibility of the proposed construction works and activities would largely be restricted at motorists' eye-level by intermittent urban and industrial development, as well as by woodland blocks, farm woodlands, shelterbelts, and field boundary vegetation along the roads accessed; resulting in fleeting or glimpsed views at most, particularly when considering the varying speeds of travel adopted and the curvature of the routes. Where views would not be obscured, the proposed construction works and activities would be viewed momentarily and for short durations (and often at oblique angles to the primary direction of travel). Where seen, the proposed development would be viewed in the context of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes. There is expected to be only limited and sporadic occasions where the proposed works would be viewed from the local road network. Whilst there is the prospect for significant visual effects at specific locations where foreground elements permit unobstructed views of the proposed development, the limited prospect for frequent occurrences in sequential views at similar distances limits the potential for significant effects.

Transport route	Rationale
Ayrshire Coast Line	The ZTV shows concentrated theoretical visibility of the proposed development between the stations at Largs and Fairlie, with notable voids in visibility as the line routes from Fairlie and West Kilbride. In addition, a portion of the route at Fairlie is tunnelled where there is no prospect to view the proposed construction works and activities. As the line passes through urbanised areas, built form, street/garden vegetation, and structural woodland along the railway line, would combine to restrict visibility of the proposed construction works and activities. When trains travel through more coastal areas, there is greater prospect for unobscured views. In such views, the proposed construction works and activities would be viewed momentarily and for extremely short durations due to the high speeds of travel. Where seen, the proposed works would be viewed in the context of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes. There is expected to be only limited and sporadic occasions where the proposed development would be viewed from the Ayrshire Coast Line. Whilst there is the prospect for significant visual effects at specific locations where foreground elements permit unobstructed views of the proposed development, the limited prospect for frequent occurrences in sequential views limits the potential for significant effects.

6.8.9 Recreational route assessment

Table 6-8 below presents the findings of a recreational route assessment, identifying those that have the potential to undergo significant effects.

Table 6-8: Recreational Route Assessment

Recreational route	Rationale
Ayrshire Coastal Path	Included in detailed assessment due to potential level of repeated occurrences of unobstructed visibility in proximity to the proposed development. As the route extends to approximately 170km in total, it would be disproportionate to assess the full extents of the route in detail. For the purposes of assessment, the Ayrshire Coastal Path is therefore only assessed in detail across the sections of the route that fall in the study area.
Core Path NC1	Included in detailed assessment due to potential level of repeated occurrences of unobstructed visibility in proximity to the proposed development.
Core Path NC34	Included in detailed assessment due to potential level of repeated occurrences of unobstructed visibility in proximity to the proposed development.
Core Path NC36	Included in detailed assessment due to potential level of repeated occurrences of unobstructed visibility in proximity to the proposed development.
Core Path NC60	Included in detailed assessment due to potential level of repeated occurrences of unobstructed visibility in proximity to the proposed development.
Core Path NC61	Included in detailed assessment due to potential level of repeated occurrences of unobstructed visibility in proximity to the proposed development.

Recreational route	Rationale
Wider core path network	The ZTV shows varying degrees of theoretical visibility of the proposed development from the wider core path network. As the paths pass through urbanised areas; built form, street/garden vegetation, and structural woodland would combine to restrict or impinge visibility of the proposed construction works and activities. When the paths route through coastal or rural areas, the expectation is that visibility of the proposed construction works and activities would largely be restricted by intermittent urban and industrial development, as well as by woodland blocks, farm woodlands, shelterbelts, and field boundary vegetation along the paths accessed; resulting in fleeting or glimpsed views at most. Where views would not be obscured, receptors focus is most likely to be focussed seawards; with landward features such as the proposed development providing contextual features in wider panoramas alongside settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes. There is expected to be only limited and sporadic occasions where the proposed works would be viewed from the wider core path network. Whilst there is the prospect for significant visual effects at specific locations where foreground elements permit unobstructed views, the limited prospect for frequent occurrences of the proposed development in sequential views limits the potential for significant effects.

6.8.10 Recreational destinations & visitor attractions assessment

Table 6-9 below presents the findings of a recreational destinations and visitor attractions assessment, identifying those locations where people may have the potential to undergo significant effects.

Table 6-9: Recreational Destinations & Visitor Attractions Assessment

Attraction	Rationale
Hunterston Castle	As views of the proposed development may be obtained from Hunterston Castle, nearby Hunterston House has been selected as a representative viewpoint. For detail on the assessment of effects on views, refer to Viewpoint 1: Hunterston House.
Lion Rock Viewpoint	As views of the proposed development may be obtained from the Lion Rock Viewpoint, the location has been selected as a representative viewpoint. For detail on the assessment of effects on views, refer to Viewpoint 4: Lion Rock Viewpoint.
Fairlie Viewpoint	As views of the proposed development may be obtained from the Fairlie Viewpoint, the location has been selected as a representative viewpoint. For detail on the assessment of effects on views, refer to Viewpoint 5: Fairlie Viewpoint.
Portencross Castle and Harbour	As views of the proposed development may be obtained from the harbour, the location has been selected as a representative viewpoint. For detail on the assessment of effects on views, refer to Viewpoint 7: Portencross Castle and Harbour.
Glaid Stone Viewpoint	As views of the proposed development may be obtained from the Glaid Stone Viewpoint, the location has been selected as a representative viewpoint. For detail on the assessment of effects on views, refer to Viewpoint 8: Glaid Stone Viewpoint.

6.9 Statement of Significance

This SLVIA has assessed that significant seascape, landscape and visual effects resulting from the proposed development would be contained within a very localised area around the application site, with significant seascape and landscape character, and visual amenity effects assessed as occurring within distances of up to ~3km from the proposed development (depending on the presence of intermittent urban and industrial built form, transport corridors, and tree and vegetation cover).

The localised presence of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes diminishes the potential for significant effects from the surrounding seascape and landscape environments by limiting/restricting visibility of the proposed construction works and activities, and associated infrastructure, or assisting with their visual integration.

In certain views in proximity of the application site, the increased volume of construction works, activities and shipping/vehicle movements would be apparent (principally from the Hunterston estate, Great Cumbrae Island, and Little Cumbrae Island). The temporary presence of taller elements such as high mast lighting columns, cranage, and cargo movements from larger ships would also present a noticeable contrast in scale with existing elements, particularly when viewed at close distances, when their presence would be amplified by their closer proximity to the viewer. In contrast, natural perspective would aid the viewers perception of scale difference from more distant locations, particularly in instances when the taller elements would accord with existing urban and industrial built form and vertical structures against the sky.

When considering the operational cumulative context, the addition of the proposed development would only slightly increase the presence of construction works and activities in the immediately surrounding landscape.

When considering the consented and planning application stage cumulative scenarios, construction works and activities undertaking for the other planning application stage developments delivered as part of the Hunterston PARC masterplan would influence the extent of cumulative effects.

Given the proximity of all the planning application stage developments under consideration, the significant effects identified in the SLVIA are considered to occur as a result of the proposed development in its own right (i.e., introduced to the ‘host’ CCA, LCT or proximity views) and cumulatively with the baseline and planning application stage scenarios.

Whilst the results of this SLVIA have assessed that the proposed development would result in significant seascape, landscape and visual effects during the duration of the construction phase; the works are not considered to reach unacceptable levels, particularly when considering the type of construction works and activities required to modernise the site into a facility suitable for use by the offshore renewable industries.

7 TERRESTRIAL NOISE

7.1 Introduction

This chapter summarises the findings of the construction noise impact assessment (CNIA) which was carried out for the proposed development. The noise assessment considers the airborne construction noise impacts at existing sensitive receptors surrounding the site. The full CNIA is presented in Technical Appendix 7.1.

The effects of construction noise on marine life is considered as part of the Underwater Noise Assessment presented in Technical Appendix 5.4, and Chapter 5 – Marine Ecology of the EIAR. The effects of construction noise on nesting birds is considered as part Chapter 5 - Biodiversity of the EIAR.

7.2 Scoping and Consultation

A summary of the relevant responses to the Scoping Report submitted by EnviroCentre is shown in Table 7-1.

Table 7-1: Summary of Consultation Responses

Organisation	Consultation Response	Outcome
Marine Scotland	The Scottish Ministers agreed with the approach to the assessment of terrestrial noise as detailed in the Scoping Report and with the proposed inclusion of a construction noise impact assessment and the mitigation proposed. The North Ayrshire Council representation agreed that there will be a likely impact from construction noise and notes the Applicant's commitment to consult with North Ayrshire Council Environmental Health Department to agree a methodology for a noise impact assessment.	Assessment of construction noise has been included in the EIA report assuming worst case construction scenarios, source data contained within BS 5228 and baseline monitoring data captured in 2019. A CNMP has been prepared and is presented in full within Technical Appendix 7.1
North Ayrshire Council (NAC)	The construction noise impact assessment methodology was presented by EnviroCentre Ltd to NAC and approved on 12/04/2024. The assessment methodology includes use of previously monitored baseline levels for determination of receptor sensitivities and magnitudes of impact. It was requested by NAC that a Construction Noise Management Plan (CNMP) should be prepared to ensure that the best practicable means are adopted to minimise disruption to occupiers of nearby noise sensitive properties.	

7.3 Policy, Legislation and Guidance

The assessment of construction noise impacts on the residential receptors surrounding the development site has been undertaken in accordance with the following:

- National Planning Framework 4[74]
- Planning Advice Note (PAN) 1/2011 – Planning and Noise[75]
- Technical Advice Note (TAN) – Assessment of Noise[76]
- World Health Organisation Guidelines for Community Noise[77]
- BS5228-1:2009+A1:2014; Code of Practice for Noise and Vibration on Construction and Open Sites[78]
- ISO 9613-2:1996 – Acoustics – Attenuation of Sound during Outdoor Propagation – Part 2: General Method of Calculation[79]

7.4 Methodology

The noise assessment was undertaken to establish the impact of construction and operational activities on noise sensitive receptors surrounding the Site. The assessment involved the following stages;

- Consultation with NAC Environmental Health Department to confirm assessment methodology, noise criteria and use of previously captured baseline data;
- Review of previous survey data captured by EnviroCentre Ltd. of baseline noise environment at areas representative of the most exposed noise sensitive receptors surrounding the proposed development; the monitoring locations are and shown in Drawing No. 176482-GIS003A in Volume 2 8.1;
- Review of construction activities, locations and noise data;
- Calculation and assessment of construction noise at the most exposed sensitive receptors, following guidance provided in BS5228-1:2009+A1:2-014; Code of Practice for Noise and Vibration on Construction and Open Sites. 3D computer noise modelling using CadnaA software has been used in the calculation of construction noise at sensitive receptors; and
- Preparation of a CNMP employing best practicable means to reduce construction noise across the site.

7.5 Baseline

A baseline noise survey was carried out in the area surrounding the proposed development site during day and night-time periods between 11th and 12th June 2019. The purpose of the survey was to establish day and night-time background noise levels at areas representative of the most exposed properties surrounding the development site.

The noise monitoring locations and survey results from 2019 were presented to NAC Environmental Health department during consultation. Using the ABC method presented within BS5228-1:2009+A1:2014, these measurements result in all of the assessed NSRs being subject to Category A thresholds for impact, the most stringent for each of the periods considered. The baseline monitoring results are therefore considered representative and appropriate for assessment of construction noise impacts and have been approved for use NAC

The noise monitoring locations are described in Table 7-2, and shown Drawing No. 176482-GIS003A in Volume 2.

[74] The Scottish Government (February 2023), *National Planning Framework 4.*
[75] The Scottish Government (2011), *PAN 1/2011 Planning and Noise*.
[76] The Scottish Government (2011), *TAN 1/2011 Technical Advice Note*.
[77] World Health Organization (1999), *Guidelines for Community Noise*.
[78] British Standards Institution (2014), *BS 5228-1:2009+A1:2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise.*
[79] International Organization for Standardization (1996), *ISO 9613-2:1996 – Acoustics – Attenuation of Sound during Outdoor Propagation – Part 2: General Method of Calculation*.

Table 7-2: Noise Monitoring Locations

NSR ID	Grid Reference	Location
01	219366 651633	Hunterston Castle
02	220696 652737	Glenside Cottage
03	220824 654908	Fairlie Foreshore
04	221132 655129	Castle Park Drive
05	217560 654448	Cumbrae - Marine Parade

7.6 Potential Impacts and Modelled Scenarios

Construction Schedule

Details of the proposed construction schedule at the Site have been supplied by Arch Henderson. The initial works to provide access and prepare the site for construction shall be followed by a primary construction phase during which there will be overlap of the majority of noise generating activities A summary of the proposed construction schedule is shown in Table 7-3.

Table 7-3: HCY, Proposed Construction Schedule

Phase	Description
Access Road Construction and Site Clearance (ARC)	Access road upgrade and infrastructure installed to main site.
	Erection of temporary site offices and staff welfare buildings to accommodate site workforce.
Infill and Compaction of Drydock, Construction of Quaywall **(CON)**	Infilling of dry dock using suitable material which is assumed to mainly comprise dredge arisings,
	Creation of berthing by formation of a quay constructed of steel tubular piles with interlocking sheet piles with a further inner tied sheet pile anchor wall
	Ground improvement works including piling at eastern site boundary.
	Excavation of current landform and dock wall base to remove from in front of the new quay wall.
	Dredging adjacent to Quay Wall to provide -12m Chart Datum (CD) water depth.

The anticipated timetable for works is expected to be:

- ARC – Commencing second half of 2024 assuming planning and marine licences can be obtained.
- CON – Proposed to be carried out between second half of 2024 and first half of 2026.

Construction timelines are currently estimated based on similar schemes undertaken in recent years. Timelines also assume no restrictions on vessels, plant, manpower or equipment.

The modelled scenarios have been set up to consider the worst-case combination of construction activities for the construction phases. A summary of the combined construction activities and relevant assessment periods for each of the modelled scenarios is shown in Table 7-4. A full breakdown of the individual items of plant and activities for each set of construction activities and scenarios are shown in Appendix C of Technical Appendix 7.1. It should be noted that while the modelling has predicted all operations to be concurrent, this is a conservative assumption, and some activities will in fact be contiguous.

Table 7-4: Modelled Scenarios; Construction Noise

Modelled Scenario	Modelled Combination of Construction Stages (Worst Case)	Relevant Assessment Periods
ARC	Excavation and drilling	Day, Weekend
	HGV movement of material and tipping	
	Rolling/compaction	
	Surfacing	
CON	Excavation and drilling, HGV movement of material and tipping	Day, Evening, Night, Weekend
	Drainage, infill and rolling/compaction	
	Piling of Quay Wall at former dry dock area and eastern boundary with Southannan Sands	
	Install sheet pile wall	
	Tie rod / anchor walls	
	Surfacing	
	Dredging	

Evening and Night-time Construction Noise

With reference to the assessment periods included in Table 7-4Table 7-4, only in the case of dredging are works scheduled to be carried out over a 24-hour period. All other activities are expected to have finished by 7 pm on a daily basis.

Weekend Construction Noise

The proposed construction schedule includes working during daytime hours during the week days and the weekends. The implication of this is that works associated with higher noise levels are likely to potentially also take place during weekend hours (Saturday 07:00 – 19:00 and Sunday 09:00 – 13:00), which are subject to more stringent noise limits than during the weekdays.

Infill of the Dry Dock

Prior to infilling of the dry dock demolition works will be undertaken to remove the existing dry dock base and any other associated infrastructure. Removal of the concrete dry dock base shall progress using heavy tracked plant to excavate and rip material.

It is anticipated circa 1.3million m^3 of suitable fill material will be required to infill the dry dock, including surcharge material. This is proposed to be primarily achieved through the reuse of the dredge arisings from around the existing dock berth and the offshore dredge area. Should the proposed dredge not provide a sufficient volume of material to complete the infill, suitable material would be sourced from dredging operations in the area, with one possible source identified as routine maintenance dredging activities of the Clyde. Additional infill material may be brought to site by road or by barge. The modelled scenario includes provision for multiple earth moving vehicles including 18T dozers, dump trucks, high capacity excavators and drilling rigs.

This area will require implementation of ground improvement techniques to accommodate operational loads for future land use. Tubular piles shall be installed vertically, employing a mixture of vibro and impact techniques into deep strata. Sheet piles will be installed vertically between the steel tubular piles. Sheet piles are expected to be driven to shallower depths than the tubular piles. Anchor piles shall then be constructed behind the tubular piles, with either horizontal or inclined tie rods which connect tubular and anchor piles. In addition to both vibro and impact

piling, the assessment includes roller compaction and surfacing operations facilitated by batching plant, with all operating simultaneously to create a worst case scenario.

Additional piling and ground improvement works are also proposed along the eastern site boundary where the access road runs parallel to Southannan Sands and included within the primary construction scenario. This is required as part of the platforming of the site.

Other than the mobilisation of heavy vehicles and plant, the site is to be self-contained during construction. Arch Henderson have indicated that as many 8 dump trucks and 10 excavators may be required to service this.

Quay Wall

The proposed structure for the quay wall will take the form of a tied cofferdam wall consisting of a combined wall to the front and rear, made up of large diameter steel tubular piles with steel sheet piles between. The piling operations are similar to those proposed for the ground improvement techniques proposed for the primary site, though with increases to pile concentration, dimension and depth.

The front wall will be connected to the rear wall using steel tie rods. The tubular piles that will form the cofferdam wall will be approximately 35m long, driven to refusal / into rock in order to create sufficient deep water berthing options to support future operations – subject to final design load requirements. Additional tubular piles may be installed within the structure in order to allow increased loads in specific areas.

At the time of writing the final configuration of the Quay wall has not been determined. For the purposes of this assessment a 570m Quay Wall has been assumed to create a worst-case modelled scenario in terms of noise source locations and quantities.

Additional piling has also been modelled from rigs set on a jack up/hopper barge moored to dolphin platforms offset from the Quay Wall, along with tug boats and service vessels. Movement and tipping of dump trucks is also included within the modelled scenario for Quay works.

Dredging

A dredging campaign will be carried out during the construction phase to create the deepwater berthing area at the quayside, with additional dredging carried out offshore to claim fill material for the dry dock area. Dredging has the potential to be carried out over a 24 hour period. The dredge area is shown on Drawing HMY-AHN-01-00-DR-C-9100.

It has been assumed the dredging will be carried out using trailer suction hopper dredger to remove soft dredge and backhoe for ripping harder material. Backhoe dredging generates higher airborne noise levels than the trailer suction hopper dredger method, therefore this CNIA assumes use of the backhoe method employed at the western extent of the dredge area as a worst-case scenario for propagation to the closest NSR at Marine Parade, Cumbrae. Where trailer suction hopper methods are employed the levels shall be less than those presented in this report.

Construction Noise Model Data and Assumptions

3D computer noise modelling of the various stages of construction activity at the site has been carried out using CadnaA software. Details on worst case construction activities, operating times, and associated items of noise generating plant for each stage of construction used within the noise models have been supplied by Arch Henderson. Full details of the construction noise modelling data and assumptions are provided in Technical Appendix 7.1. in Volume 3.

7.7 Impact Assessment

The outcome of the BS5228 assessment is that **Neutral impacts** are predicted at all of the surrounding residential receptors as a result of all construction phases during the daytime and evening periods for weekdays and weekends.

During the night-time period, NSR05 is predicted to be subject to a 3dB excess above BS5228 threshold level of 45 dB, with a **Moderate Adverse Significance of Impact**. The predicted impact is owing to dredging which has been assumed to be occurring at the closest possible point to this receptor using the backhoe method which generates significantly more noise than the cutter suction method. Employing cutter suction dredging at this location results in a neutral Significance of Impact.

In accordance with the guidance provided in the Technical Advice Note (TAN) 1/2011 and the adopted significance criteria shown detailed in Technical Appendix 7.1**Error! Reference source not found.**, “These effects, if adverse, while important, are not likely to be key decision making issues.”

7.8 Mitigation

In order to reduce the significance of impact at NSR05 during the night-time period, it is recommended that dredging is scheduled such that backhoe dredging is not undertaken during the night in close proximity to the isle of Great Cumbrae. Mitigation of dredging noise at source is not considered practicable. There are no impacts associated with backhoe dredging during daytime hours.

In the modelled scenario, the backhoe dredger is placed on the dredge area boundary at a distance of approximately 1040m from NSR05 and 500m from the Quay Wall. Reducing the distance between backhoe dredging operations and the Quay wall will therefore reduce the significance of impact at NSR05 in the event that night-time use of backhoe dredging is required. The Significance of Impact due to backhoe dredging at night is predicted to be reduced at the following distances from the Quay Wall:

- 350 metres: Slight Adverse - These effects may be raised but are unlikely to be of importance in the decision-making process.
- 125 metres: Neutral - No effect, not significant, noise need not be considered as a determining factor in the decision-making process.

Employing trailing suction hopper dredging at the northwestern extent of the dredge area is also noted to result in a neutral Significance of Impact during both daytime and night-time.

In accordance with the scoping determination issued by NAC, a CNMP has also been prepared to minimise any potential significant impacts associated with construction noise. This is presented in full in Appendix D of Technical Appendix 7.1.

7.9 Cumulative Impact Assessment

A review of potential cumulative impact was undertaken incorporating review of the noise impact assessments undertaken for the developments detailed in Table 4-9. The review highlighted that there were no construction noise assessments undertaken in relation to the other developments. The assessment undertaken for this EIAR is therefore considered to be sufficiently conservative as the baseline data results in the lowest impact thresholds at all assessed NSRs in accordance with BS 5228.

No cumulative effects linked to terrestrial noise are likely associated with the proposed development.

7.10 Residual Effects

There are no predicted residual effects associated with construction noise.

7.11 Statement of Significance

Following implementation of the CNMP and with appropriate planning and scheduling of night-time dredging activities, there should be no significant adverse effects on any NSRs.

8 TRAFFIC ASSESSMENT

8.1 Introduction

This chapter examines the environmental impacts with regards to access traffic and transportation for the upgrade of the existing HCY into a harbour facility with a large working platform suitable for renewable industries.

The data underpinning this assessment is based on recently collected traffic data and construction traffic data estimates provided by the client, which will include the likely phasing of the construction works.

The assessment considers the potential impacts on traffic and transportation associated with the development.

8.2 Scoping and Consultation

The assessment considers the potential impacts on the road network of interest, which includes:

- The A78 Irvine Road;
- Power Station Road;
- Oilrig Road.

The study area has been agreed with North Ayrshire Council.

8.3 Policy, Legislation and Guidance

A review of the prevailing transport planning policy identifies consistent policy objectives which seek to provide efficient, safe and sustainable movement of people to and from construction sites/development by encouraging sustainable transport options (walking, cycling and public transport) and allowing access by private vehicle where necessary. For example, National Planning Framework 4 states that design and mitigation should aim to manage impact on road traffic and adjacent trunk roads, including during construction. Relevant national and local policy documents are set out below:

- National Planning Framework 4 (NPF4) (Scottish Government, 2023);
- Planning Advice Note 75 (PAN 75) – Planning for Transport (Scottish Government, 2005);
- Transport Assessment Guidance (Transport Scotland, 2012);
- A Call to Action: The Regional Transport Strategy for the West of Scotland 2023 – 2038 (Strathclyde Partnership for Transport, 2023);
- North Ayrshire Local Transport Strategy (North Ayrshire Council, 2015);
- North Ayrshire Local Development Plan (LDP) (North Ayrshire Council, 2019).

8.4 Methodology

The environmental impacts of the traffic generated by the proposed development have been assessed with reference to the ‘Environmental Assessment of Traffic and Movement’, published by the Institute of Environmental Assessment (IEMA).

In accordance with this guidance, impacts associated with the development including:

- Traffic Generation;
- Severance of communities;
- Road vehicle driver and passenger delay;
- Non-motorised user delay;
- Non-motorised amenity;
- Fear and intimidation on and by road users;
- Road user and pedestrian safety; and
- Hazardous/large loads.

Environmental Assessment of Traffic and Movement (EATM), various authors, the Institute of Environmental Assessment, 2023.

For evaluation purposes, the significance of the environmental effects associated with the development generated traffic are categorised, as outlined in Table 8-1.

Table 8-1: Traffic assessment significance criteria

Significance Rating	
Substantial	Where the impact leads to serious and lasting disruption (e.g. a 90% increase in baseline traffic) and permanent mitigation measures are required.
Moderate	Where the impact is of a temporary nature, leading to disruption (e.g. a 60% increase in baseline traffic) and short-term mitigation measures are required.
Slight	Where the impact exceeds industry standard design thresholds, or a traffic increase of above 30%, but does not lead to disruption. No mitigation measures are required.
Insignificant	No perceivable impact. No mitigation measures are required.
Positive	Where the proposals result in an improvement to current conditions.

8.5 Baseline

Surrounding Road Network

The road network in the vicinity of the site comprises the A78 Irvine Road, Power Station Road, and Oilrig Road.

The A78 Irvine Road is a trunk road which runs north to south between Greenock and Prestwick. It contains sections of single and dual carriageway and has varying speed limits throughout. It will form the key construction vehicle route for vehicles entering the site from the north or south. Access to the site from the A78 can be taken from Hunterston Roundabout.

Power Station Road is a two-way single carriageway road which is accessed from the A78 via the Hunterston Roundabout. Access from Hunterston Roundabout is currently restricted with barriers. The road links to Oilrig Road approximately 1km west of Hunterston Roundabout and provides direct access to HCY.

Oilrig Road also connects with the A78 at Hunterston Roundabout and with Power Station Road approximately 1km west of Hunterston Roundabout. Where these two roads meet access to the section of Power Station Road and Oilrig Road that form the direct access to HCY is also restricted by barriers.

Walking and Cycling

A footway is provided on the northern side Power Station Road between Hunterston Roundabout and Oilrig Road, part of which forms part of the Ayrshire Coastal Path. The footway continues on Power Station Road to Hunterston, connected by an informal pedestrian crossing located on Oilrig Road.

A local cycle route is provided between the residential settlement of Fairlie and Power Station Road. This route comprises a shared use path on the western side of the A78 Irvine Road between Fairlie and Southannan Roundabout, and a shared use path segregated from the road that runs between Southannan Roundabout and Hunterston Roundabout. This route forms part of the Ayrshire Coastal Path. Using this route, Power Station Road is accessible within a 10-minute cycle of Fairlie.

Public Transport

The closest bus stops to the site are located in Fairlie and West Kilbride, which are located within 4.2km (17-minute cycle) and 5.5km (22-minute cycle) respectively. Services from these stops offer services to and from nearby locations such as Largs, Ayr, Irvine and Ardrossan

The closest railway stations to the site are Fairlie and West Kilbride, which are located approximately 5km (20-minute cycle) and 6km (24-minute cycle) from the site respectively. Both stations are located on the Glasgow to Largs line and offer one service per hour in both directions. These stations provide access to and from Glasgow, Paisley and various towns and villages in North Ayrshire.

Baseline Traffic Flows

As agreed with North Ayrshire Council during scoping discussions, the following roads are included for the purposes of this assessment:

- The A78 Irvine Road;
- Oilrig Road; and
- Power Station Road.

Automatic Traffic Count (ATC) surveys were undertaken on the A78 Irvine Road and Oilrig Road between the 23rd and 29th January 2024, inclusive, to determine baseline traffic flows. As Power Station is currently access restricted, it is assumed that no public traffic will currently use it and that the number of private vehicle trips is negligible.

The 2024 background traffic flows (two-way) for both peak hours and the annual average daily traffic (AADT) for the network of interest are provided in

Table 8-2: 2024 background peak hour and AADT two-way traffic flow data

Link Location	2024 Flows		
	AM Peak	PM Peak	AADT
A78 Irvine Road (N)	506	614	6,818
A78 Irvine Road (S)	631	718	7,403
Power Station Road / Oilrig Road (Site access)	0	0	0
Oilrig Road	213	186	1,079

Accident Analysis

An accident analysis was undertaken, covering the A78, Oilrig Road and Power Station Road in the vicinity of the site, using online accident analysis tool 'Crashmap' (crashmap.co.uk). The analysis takes account of all road traffic accidents that have taken place from 2018 to 2022, splitting the accidents by severity into slight, serious, and fatal. The accident analysis is shown in Figure 8-1.

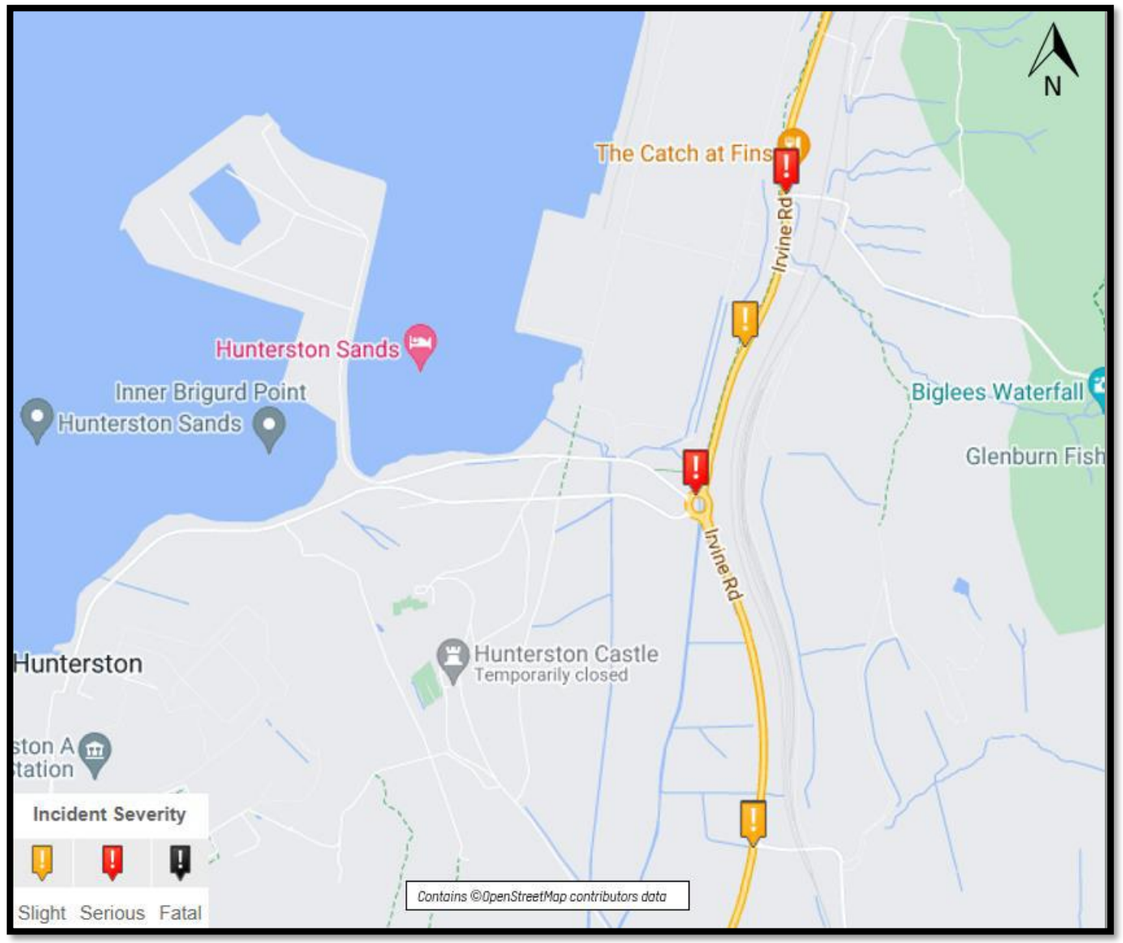


Figure 8-1: Accident Analysis

One serious accident was recorded at Hunterston Roundabout in 2018. In vicinity of the site, one serious and one slight accident were recorded on the A78 to the north of Hunterston Roundabout in 2022 and 2021 respectively. To the south of Hunterston Roundabout, one serious accident was recorded in 2021 and one slight accident was recorded in 2019, both at the junction with Kilrusken Toll.

Committed Development

North Ayrshire Council requested the following committed developments in vicinity of Hunterston to be considered for the purposes of this assessment:

- Site To South West of Hunterston Coal Yard, Fairlie - Installation of a synchronous compensator and ancillary infrastructure (20/00942/PP);
- Campbelton Farm, Hunterston Estate, West Kilbride – Electricity generating station and ancillary development (21/00855/CON);
- Site To South East of Hunterston B Power Station, West Kilbride, - Installation of Synchronous Compensator and cable route with associated infrastructure (21/01135/PPM);

- Former Coal Terminal Hunterston, West Kilbride - Cable factory, with 185m high extrusion tower (22/00133/PPPM – varied by 23/00070/PP and 23/00131/PP);
- Former Coal Terminal Hunterston, West Kilbride (22/00712/MSCM);
- Biglees Quarry, West Kilbride - Change of use to facilitate the storage of manufactured aggregate (23/00156/PP);
- Bigless Quarry, West Kilbride - Extraction and processing of stone and blending with manufactured aggregate (23/00575/PP);
- Hunterston Construction Yard, Fairlie - Site preparation works, establishment of compound area and initial groundworks including landscaping and other required infrastructure (23/00606/PP);
- Former Coal Terminal Hunterston, West Kilbride - Development and operation of a grid stability facility (23/00744/PP).

Operational traffic data was available for the 22/00133/PPPM application only, and it is assumed that traffic associated with the other applications is negligible. Traffic flows relating to the operational phase of the development are shown in Table 8-3.

Table 8-3: Committed development AADT two-way traffic flow data

Link Location	2024 Flows		
	AM Peak	PM Peak	AADT
A78 Irvine Road (N)	18	11	222
A78 Irvine Road (S)	54	33	621
Power Station Road / Oilrig Road (Site access)	0	0	0
Oilrig Road	0	0	0

Proposed Development
The proposed development includes the following:

- Demolition of existing structures including removal of the base of the former dry dock;
- Infilling of the dry dock to form a working platform;
- Formation of 570m quay wall 500mm back from MHWS i.e. in the terrestrial environment;
- Formation of a temporary working platform;
- Removal of the existing rock armour on the western boundary;
- Removal of the existing bund on the western boundary;
- Installation of sub-surface revetments for the new quay wall;
- Installation of fenders and other quay wall infrastructure i.e. drainage outfalls, mooring bollards and safety ladders and navigational aids ;
- Erection of port infrastructure including lighting columns, substations, drainage, security fencing, access gates, access road improvements (including resurfacing) and CCTV;
- Erection of temporary site offices and staff welfare buildings to accommodate site workforce.
- Capital Dredging to a depth of -12m CD;
- Disposal of dredging spoil to a licensed marine spoil disposal site; and
- Installation of navigational aids.

It is assumed that the vast majority of material associated with the proposed development will be brought in by boat. The remaining material will be brought by road.

The site will be accessed by road from Power Station Road, via Hunterston Roundabout.

8.6 Impact Assessment

Traffic Impacts
In terms of assessing the environmental effects of traffic generated by the proposed development, the assessment firstly identifies baseline traffic flows for the assessment year of 2024 (Table 8-2) using recent traffic survey data.

Detailed design and material volumes are still to be confirmed, and a construction contractor has yet to be appointed, meaning construction vehicle information has not been established at this stage. However, assumptions have been made for the purposes of this report.

It is likely that there will be a short period of mobilisation to site when the majority of HGVs will arrive and remain on site, therefore not generate additional trips on the surrounding road network. For the assessment outlined in this section, it is assumed that up to 20 two-way HGV movements (10 in / 10 out) will be generated per day on the surrounding road network.

It is estimated that there will be approximately 75 staff working on site during the construction stage. It is presumed that 60 vehicle parking spaces will be provided on site, meaning that a maximum of 120 additional two-way trips (60 in / 60 out) associated with staff arrivals and departures will be generated per day.

Construction activity will take place between the hours of 0700 hours and 1900 hours Monday to Saturday inclusive.

It is assumed that 50% of construction vehicles will arrive/depart using the A78 (N) and 50% will arrive/depart using the A78 (S).

A summary of construction vehicle movements is provided in Table 8-4

Table 8-4: Proposed development AADT two-way traffic flow data

Link Location	2024 Flows		
	AM Peak	PM Peak	AADT
A78 Irvine Road (N)	30	30	70 (10)
A78 Irvine Road (S)	30	30	70 (10)
Power Station Road / Oilrig Road (Site access)	60	60	140(20)
Oilrig Road	0	0	0

The AM and PM peak hour and AADT traffic flows for the baseline and assessment scenarios are presented in Table 8-5.

Table 8-5: 2024 peak hour and AADT two-way traffic flows

Link Location	2024 Baseline Flows			2024 Assessment Flows		
	AM Peak	PM Peak	AADT	AM Peak	PM Peak	AADT
A78 Irvine Road (N)	524	625	7,040	559	660	7,110 (+1%)
A78 Irvine Road (S)	685	751	8,024	720	786	8,094 (+1%)
Power Station Road / Oilrig Road (Site access)	0	0	0	60	60	140
Oilrig Road	213	186	1079	213	186	1,079

As shown in Table 8-5, the impact of construction vehicles is relatively low on the A78 in terms of AADT.

The HGV movements for the baseline and assessment scenarios are provided in Table 8-6.

Table 8-6: 2024 HGV traffic flows (two-way AADT

Link Location	Baseline	Assessment
A78 Irvine Road (N)	95	105(+11%)
A78 Irvine Road (S)	151	33(+7%)
Power Station Road / Oilrig Road (Site access)	0	20
Oilrig Road	5	5

As shown in Table 8-5, maximum of 11% uplift in HGV movements is experienced on the A78 (N), although this reflects an increase of 10 two-way vehicle movements only on each road. A maximum of 20 HGV movements (10 in / 10 out) are anticipated on Power Station Road throughout a 24hr hour period.

Severance
Severance is defined as the perceived division that can occur within a community when it becomes separated by major transport infrastructure and may be caused by difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.

Factors to be considered when calculating severance include road width, traffic flow and composition, traffic speeds, the availability of crossing facilities and the number of movements that are likely to cross the affected route.

During the construction, minimal pedestrian activity is expected at the site, and construction traffic will arrive at the site using the A78 on the trunk road network. There are no residential areas within the vicinity of the site or on the main vehicle route to the site.

Existing pedestrians and cyclists using Power Station Road may be affected by traffic on Power Station Road / Oilrig Road (site access), which will introduce conflict at the informal pedestrian crossing. However, the low level of traffic generated during the construction phase is likely to have a negligible impact on severance.

Given the findings of the assessment, the impact on Severance is considered to be insignificant.

Driver Delay
EATM states that traffic delays to non-development traffic can occur at various points on the road network surrounding a site, including site entrances where there are additional turning movements, on main roads passing the development site, at other key intersections and on side roads.

Given the low level of construction traffic generation, the potential impact on Driver Delay on the surrounding road network is considered to be insignificant.

Non-motorised User Delay
Non-motorised User Delay is defined as the level of delay that non-motorised users experience when crossing roads. Changes in volume, composition or speed of traffic may affect the ability of non-motorised users to cross roads, and the level of delay also depends on the level of pedestrian activity, visibility and general physical conditions of the development site.

Existing users of the footway on Power Station Road may experience slight delay when crossing at the informal pedestrian crossing due to the opening of the road to construction traffic. However, the number of vehicle movements throughout the day is low and it is assumed that the impact on delay would be negligible. Non-motorised User Delay is therefore considered to be insignificant.

Non-motorised User Amenity
Non-motorised User amenity is defined as the relative pleasantness of a journey and is impacted by traffic flow, traffic composition and pavement width/separation from traffic.

Previous guidance has stated that a tentative threshold for judging changes in pedestrian amenity would be where traffic flow (or HGV component) is doubled.

Re-opening Power Station Road / Oilrig Road (site access) to traffic has potential to reduce the pleasantness of non-motorised user journeys. However, due to the low level of construction traffic generated, the impact on Non-motorised User Amenity is considered to be insignificant.

Fear and Intimidation
Fear and Intimidation is affected by total volume of traffic, heavy vehicle composition, vehicle speeds, proximity of traffic to people.

EATM provides a weighting system to assess the level of Fear and Intimidation, as shown in Table 8-7 to Table 8-9.

Table 8-7: Fear and Intimidation degree of hazard

Average traffic flow over 18-hour day – all vehicles/hour 2-way (a)	Total 18-hour heavy vehicle flow (b)	Average Vehicle Speed (c)	Degree of hazard score
1,800	3,000	->40	30
1,200 - 1,800	2,000 - 3,000	30 – 40	20
600 - 1,200	1,000 – 2,000	20 – 30	10
<600	<1,000	<20	0

The total score from Table 8-8 is combined to provide a level of Fear and Intimidation, shown in Table 8-7

Table 8-8: Levels of Fear and Intimidation

Level of Fear and Intimidation	Total Hazard Score (a) + (b) + (c)
Extreme	71+
Great	41-70
Moderate	21-40
Small	0-20

The magnitude of impact is determined by the change in level of fear and intimidation, as shown in Table 8-9.

Table 8-9: Magnitude of Impact of Fear and Intimidation

Magnitude of Impact	Change in step/traffic flows (AADT) from baseline conditions
High	Two step changes in level
Medium	One step change in level but with: • >400 veh increase in average 18hr average two-way all vehicle flow; and/or; • >500 HV increase in total 18hr HV flow
Low	One step change in level, with: • <400 veh increase in average 18hr average two-way all vehicle flow; and/or; • >500 HV increase in total 18hr HV flow
Negligible	

Based on the criteria above, the level of fear and intimidation is currently moderate. As the change in traffic levels during the construction phase will be low, there will be no change in the level of fear and intimidation on the A78 and Oilrig Road and therefore the magnitude of impact will be negligible.

Re-opening Power Station Road / Oilrig Road (site access) to traffic may increase the level of fear and intimidation on this road. However, due to the low level of construction traffic expected, the impact on fear and intimidation will likely be negligible.

The impact on Fear and Intimidation is therefore considered to be insignificant.

Road Safety
EATM states that 'collision cluster' assessment can be used to identify potential impacts on road accident rates, which is based on the number of personal injury collisions occurring within a defined area in a given spatial radius.

As shown in Figure 8-1, the number and severity of accidents that have occurred on the road network surrounding the site since 2018 are considered to be relatively low with no discernible accident patterns. It can therefore be concluded that there are no historical road safety issues associated with the road network surrounding the development.

The resultant impact from development traffic on Road Safety is therefore considered insignificant.

Hazardous Loads / Large Loads
It is not anticipated that there will be any hazardous load / large load vehicle movements associated with the development. Therefore, the impact will be insignificant.

8.7 Mitigation and Monitoring

No mitigation measures are required to support the proposed development.

8.8 Residual Effects

With respect to the proposed development, it is anticipated that the residual impacts will be Insignificant.

8.9 Statement of Significance

Table 8-10 summarises the significance of potential impacts as a result of the proposed development.

Table 8-10: Summary of Impacts

Description of Effect	Significance of Potential Impact	Mitigation Measure	Significance of Residual Impact
Traffic Impacts	Insignificant	No mitigation proposed	Insignificant
Severance	Insignificant	No mitigation proposed	Insignificant
Driver Delay	Insignificant	No mitigation proposed	Insignificant
Non-motorised User Delay	Insignificant	No mitigation proposed	Insignificant
Non-motorised User Amenity	Insignificant	No mitigation proposed	Insignificant
Fear and Intimidation	Insignificant	No mitigation proposed	Insignificant
Road Safety	Insignificant	No mitigation proposed	Insignificant
Hazardous Loads / Large Loads	Insignificant	No mitigation proposed	Insignificant

This Traffic Assessment chapter has evaluated the potential environmental impacts resulting from the addition of the development generated traffic on to the existing road network.

In accordance with the prevailing guidance, the environmental impacts including; traffic impact, severance, driver delay, non-motorised user delay and amenity, fear and intimidation, road safety, and hazardous/large loads associated with the construction phase of the development have been assessed.

Table 8-10 summarises the significance of potential impacts for each assessed environmental effect. It is predicted that the proposed development will have an insignificant impact overall.

8.10 References

Department for Transport (2007). Manual for Streets.

National Highways (2020). Design Manual for Roads and Bridges LA104 Environmental Assessment and Monitoring.

Institute of Environmental Management and Assessment (2023). Guidelines: Environmental Assessment of Traffic and Movement.

9 WATER ENVIRONMENT AND COASTAL PROCESSES

9.1 Introduction

This chapter on the EIAR provides an assessment of the implications of the proposed development on the water environment and coastal processes. The water environment is considered to encompass hydrology, hydrogeology and water quality, whilst coastal processes are considered to encompass tides, waves and sediment transport processes.

The Water Framework Directive (WFD) (Council Directive 2000/60/EC) aims to protect and enhance water bodies within Europe and covers all estuarine and coastal waters out to 1 nautical mile. This requires that there is no deterioration in the quality of surface or groundwater bodies and aims to achieve good ecological status or potential. The implications of the WFD must be considered when assessing this project and the details of how compliance will be achieved provided in the EIAR.

Details of the site and the proposed development are provided in Chapter 2: Proposed Development. The assessment will identify sensitive issues within the site by establishing the current baseline and examining the potential effects of the proposed development within this context.

The chapter is supplemented by the following appendices within Volume 3 of this EIAR, along with relevant figures provided within Volume 2:

- Technical Appendix 9.1: Hunterston Marine Yard Coastal Assessment
- Technical Appendix 9.2: BPEO
- Technical Appendix 9.3: NatureScot Correspondence

9.2 Scoping and Consultation

Scoping opinions have been received from Scottish Ministers, comments are referred to option from other consultees including NatureScot and RYA and North Ayrshire Council. A summary of the relevant scoping response is set out below in Table 9-1: , with details of how the scoping consultation has been taken into consideration when conducting this assessment.

Table 9-1: Summary of Consultation Responses

Organisation	Consultation Response	Comments
NatureScot	The proposed dredge pocket does not directly infringe on the Southannan Sands SSSI however dredging operations could have indirect impact due to changes in today currents, wave patterns, suspended sediment or slumping of beach sediments. The main issue is whether the proposed dredge pocket and quay wall could cause significant changes to the hydrodynamics which could result in a loss of SSSI sandflat habitats (effects on benthic species).	Addressed throughout the chapter with the assessment informed by hydrodynamic modelling (Volume 3, Technical Appendix 9.1).
	Require clarity in how potential hydro-sedimentary effects will be handled. It is proposed that the chapter should assess the magnitude of hydro-sedimentary effects separately to the magnitude of those effects on the sensitivity of the sandflat habitat and predict the degree/significant of impact.	This chapter presents an assessment of impact to the water environment and coastal processes, informed by modelling undertaken in support of the EIAR (Technical Appendix 9.1, Volume 3 of the EIAR). Impacts to ecological receptors are assessed within chapter 5.
	Although the proposal to separately assess changes to tidal currents, waves and sediment transport is reasonable, the Coastal Processes chapter must go on to assess the magnitude of any likely change in sandflat extent and extent of sub-habitats due to changes to those three factors in combination.	The combined (cumulative) impact to morphology (including sediment transport processes and bathymetry) resulting from impacts to tidal hydrodynamics and wave climate is assessed in sections 9.7.2.4 and 9.7.3.5 for the construction and operational phases respectively. Impacts to ecological receptors are assessed within chapter 5
	The potential effect of a dredge-induced sediment plume should assess separately as well as side-slope relaxation.	Impact of a dredge-induced sediment plume and side slope relaxation are considered in Section 9.7.
	The coastal modelling study will assess the impact on water quality, potential for particulate and chemical contamination from areas a result of proposed works. It should cover the dredge plume dispersal from the dredge work associated with the construction of quay and subsequent maintenance dredging that will be carried out during the operation of the port. The outputs should include likely sedimentation levels, turbidity (SSC) and impacts on benthic species and habitats.	Impact on water quality is considered in Section 9.7. Impacts on benthic habitats and other ecological features are considered in section 5.6.
	Coastal-process effects should be seperated out into construction and post-construction/ operation phases.	Impact on the coastal processes and water environment will be considered separately for construction and operational phases of the development, considered in section 9.7.2 and 9.7.3.
	It is proposed to undertake an updated modelling study to assess coastal-processed effect with qualitative assessment of sediment transport. Consideration should be given to semi-qualitative assessment of sediment transport using formulae.	Impact on sediment transport is considered in sections 9.7.2.4 and 9.7.3.5 for the construction and operational phases respectively.
North Ayrshire Council	The proposed chapter should be included in any EIA report.	Effects on the water environment/ coastal processes will be addressed in this chapter.

Organisation	Consultation Response	Comments
RYA Scotland	The scoping report mentions in 13.2.9.2 that the UKCP18 data did not show any compelling trend in storminess, which is correct. However, there is more up to date and comprehensive information on the website of the Marine Climate Change Impacts Partnership (https://www. mccip.org.uk/).	This information has been reviewed for the baseline assessment, as summarised in Section 9.5.8.
Scottish Environment Protection Agency (SEPA)	Falls below the threshold for when SEPA state advice	

9.3 Policy, Legislation and Guidance

The assessment for the water environment and coastal processes has been undertaken with reference to the following relevant planning policy, legislation and guidance.

9.3.1 Relevant Planning Policy

- National Planning Policy 4 (NPF4) (2023);
- UK Marine Policy Statement (2011); and
- Scotland's National Marine Plan (2015).

9.3.2 Relevant Legislation

- Water Framework Directive 2000;
- Water Environment and Water Services (Scotland) Act 2003;
- Marine (Scotland) Act 2010;
- Coast Protection Act 1949;
- Flood Risk Management (Scotland) Act 2009;
- Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR);
- Water Environment (Miscellaneous) (Scotland) Regulations 2017;
- National Planning Framework 4;
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (The Habitats Directive);
- Environmental Impact Assessment (EIA) Directive (2014/52/EU);
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017; and
- The Marine Works (Environmental Impact Assessment) Regulations (Scotland) 2017.

9.3.3 Relevant Guidance

- Guidelines for Water Pollution Prevention from Civil Engineering Contracts;
- Land Use Planning System (LUPS) SEPA Guidance CC1: Climate change allowances for flood risk assessment in land use planning;
- LUPS-GU24: Flood Risk and Land Use Vulnerability Guidance;
- Guidelines for Pollution Prevention (GPP) 1 Understanding your environmental responsibilities – good environmental practices;
- GPP 2 Above ground oil storage;
- GPP 3 Use and design of oil separators in surface water drainage systems;
- GPP 5 Works and maintenance in or near water;
- GPP 6 Working on construction and demolition sites;
- Pollution Prevention Guidelines (PPG) 7 Safe operation of refuelling facilities;
- GPP 8 Safe Storage and Disposal of Used Oil;
- GPP 13 Vehicle washing and cleaning;
- PPG 18: Managing for water and major spillages;
- GPP 22: Dealing with spills;
- GPP 26: Storage & handling of drums & intermediate bulk containers;
- GPP 21: Pollution incident response planning;
- WAT-SG-26: Good Practice Guide – Sediment Management; and-
- WAT-SG-29: Good Practice Guide – Construction Methods.

9.4 Methodology

9.4.1 General

The assessment follows standard EIA procedures which include:

- Desk based review of the design of the proposed development in relation to the local water environment, soils and coastal processes;
- Consultation with key stakeholders to obtain relevant information and ensure their concerns are addressed within the study;
- Establishing the existing baseline conditions:
  - Review topography, soils, geology and ground conditions at the site;
  - Review of hydrology, flooding and water quality conditions;
  - Review of coastal processes including bathymetry, tidal levels, tidal flow currents, wave action, bed sediment type and distribution, sediment transport and deposition, and geology;
  - Review of detailed hydrodynamic modelling report provided in Volume 3, Technical Appendix 9.1;
  - Reporting of baseline conditions to provide a basis for assessment of the potential impact.
- Impact Assessment:
  - Identification of sensitive receptors and environmental constraints;
  - Identification of potential impacts;
  - Assessment of impact magnitude;
  - Identification and assessment of mitigation measures to reduce or avoid any potential impacts of the proposed development; and
  - Statement of residual effects.

9.4.2 Assessment Criteria

The assessment criteria set out in Table 9-2 and Table 9-3 has been used to develop a matrix to assess the significance of effects from the proposed development on the local water environment (Table 9-4). The assessment of residual effects also takes into consideration the probability of the effect occurring (certain, likely, possible or unlikely) and the duration of the effect (short (less than 2 years), medium (2 – 5 years), long term (more than 5 years) or permanent).

All direct and indirect impacts causing moderate or major effects as identified in Table 9-4 are considered to be significant.

Table 9-2: Criteria for Assessing Receptor Sensitivity

Receptor Sensitivity	Description
Low	Receptors with a high capacity to accommodate change, low value or poor condition and no significant uses, for example: • Receptor is not an internationally, nationally or locally designated site. • Not classified as a surface water body for the River Basin Management Plan (RBMP). • Surface water body not significant in terms of fish spawning and no other sensitive aquatic ecological receptors e.g. freshwater pearl mussels. • Surface water body not used for abstraction. • Surface water body not used for recreation directly related to water quality e.g. angling, swimming, watersports. • Surface water body not used by commercial or recreational vessels. • Low or very low productivity aquifer with no identified abstractions.
Medium	Receptors with a moderate capacity to accommodate change, medium value or condition and limited use, for example: • Receptor is not an internationally or nationally designated site. May be a locally designated site. • Salmonid species may be present and surface water body may be locally important for spawning. No other sensitive aquatic ecological receptors e.g. freshwater pearl mussels. • Surface water body used for private water supply or medium scale industrial/ agricultural abstractions. • Surface water body used for occasional or local recreation e.g. local angling clubs. • Navigable surface water body used by commercial or recreational vessels. • Moderate productivity aquifer. • Groundwater body supports identified private water supplies or medium scale industrial/ agricultural abstractions.
High	Receptors with a low capacity to accommodate change, high value or condition and significant use, for example: • Receptor is an internationally or nationally designated site. • Surface water body supports sensitive aquatic ecological receptors e.g. freshwater pearl mussels. • Surface water body used for public water supply or large scale industrial/ agricultural abstractions. • Surface water body important for recreation directly related to water quality e.g. swimming, watersports, angling. • High or very high productivity aquifer. • Groundwater body supports public water supply or large scale industrial/ agricultural abstractions.

Table 9-3: Criteria for Assessing Magnitude of Impact

Magnitude of Impact	Description
Negligible	Very light change from baseline conditions. Change barely distinguishable, approximating to the 'no change' situation.
Low	Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of the post development condition will be similar to pre-development circumstances/patterns.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post-development character/ composition/ attributes of baseline will be partially changed.
High	Total loss or major alteration to key elements/features of the baseline (pre-development) conditions such that post-development character/composition/attributes will be fundamentally changed.

Table 9-4: Criteria for Assessing Effects

Receptor Sensitivity	Magnitude of Impact	Predicted Effect
High	High	Major
High	Medium	
Medium	High	
High	Low	Moderate
Low	High	
Medium	Medium	
Medium	Low	Minor
Low	Medium	
Low	Low	
High, Medium or Low	Negligible	Negligible

9.5 Baseline

9.5.1 Site Description

The proposed development is located approximately 2km south-west for the village of Fairlie, on an area of reclaimed land approximately 1km north of Hunterston Power Station. The site is situated on the Firth of Clyde with the stretch of Hunterston Channel to the west of the site separating it from Millport, Great Cumbrae. The site has previously been used historically for industry but is currently vacant. A hammerhead quay berth is present on the north-western corner of the construction yard and has previously been maintained to a dredged level of -3m CD (Chart Datum). A dry dock is present within the centre of the site and rock armour is present along the western boundary. More information on the site location is provided in Section 2.2.

The Southannan Sands Site of Special Scientific Interest (SSSI) bounds the site to the north-east, east and south. This SSSI is split into three areas Fairlie Sands (north-east), Southannan Sands bounding the site to the north and east, and Hunterston Sands bounding the site to the south and is designated for its intertidal sandflats habitat. The

condition of the SSSI was last assessed in July 2016 and classified as '*Favourable Maintained*' with no negative pressures identified[80].

The only stated Management Objective in the Site Management Statement for the SSSI produced by Scottish Natural Heritage in 2013 was *"to maintain the extent of the intertidal sandflat habitat by ensuring protection from damaging impacts, in particular any future coastal development"*.

Within a 5km buffer from the site there are no Marine Protected Areas (MPA), Special Protected Areas (SPA) or Special Areas of Conservation (SAC). Two additional SSSI sites fall within 5km of the site; Ballochmartin Bay SSSI (2.7km north) and Kames Bay (2.2km to the north-east).

Kames Bay SSSI is located on the southern shore of Great Cumbrae, within Millport Bay. The SSSI is in a sheltered location, behind Farland Point, approximately 2.1km north west of the proposed development area. It was notified in 1978 and re-notified in May 1985. It also carries the designation Cumbrae Marine Consultation Area (MCA). The designated interest of the site are the flora and fauna of the intertidal area (the area between the highest and lowest tidal levels) which is of national importance. The coastland is unique and scientific work has been carried there for over 100 years, since the Marine Station was established in 1896. Kames Bay is the only example on Great Cumbrae of a shore dominated by sands. These are fed with freshwater seepage and support a high faunal population.

Ballochmartin Bay SSSI is a less than 2km stretch of shore on the east side of Great Cumbrae. The southern tip of the SSSI is approximately 2.8km north-west of the proposed development. It was notified in 1978 and re-notified in May 1985. It is also designated Cumbrae Marine Consultation Area (MCA). The designated interest of the site are the flora and fauna of the intertidal area (the area between the highest and lowest tidal levels) which is of national importance. Ballochmartin Bay contains a number of habitat types and is the most varied section of coastline on Great Cumbrae. The flora and fauna of the inter-tidal and sub-littoral zone have been intensively surveyed. The beach is backed by herb-rich grassland and the road side verges support Slow Worm (*Anguis fragilis*). Carboniferous dykes are a characteristic of the island and the site is an important feeding area for waders and both common and grey seals are frequently present in the area.

EDF Energy's cold water intake for the Hunterston B Power Station is located approximately 2.4km to the south of the proposed development. The cooling water enters the station by passing through a coarse screen located at the cooling water intake.

The site is shown in relation to water environment receptors in Figure 9.1: Hydrological Overview within Volume 2 of this EIAR.

9.5.2 Topography and Bathymetry

The existing ground level on the site varies between 4.5 to 6 meters above ordnance datum (mAOD). A bund is present along the north-eastern and north-western boundary of the site with the top level of the bund varying between 8-9 mAOD. Within the centre of the site is a dry dock which slopes down to a base depth of -12.5 mAOD.

A hammerhead quay berth is present on the north-western corner of the site. As mentioned, the approach to the quay berth has been previously maintained to a dredged depth of -3mCD. A review of bathymetry of the local area shows that the waters to the north and west of the site are fairly shallow dropping steeply into the Hunterston Channel between the site and Great Cumbrae to depths between 40 and 30 meters below ordnance datum (mBOD).

9.5.3 Geology and Hydrogeology

The online British Geological Survey (BGS) 1:50,000 map identifies that the site is underlain by sandstone from the Kelly Burn Sandstone Formation, with some localised exposure of rock within the centre of Southannan Sands. The BGS superficial deposits 1:50,000 maps shows that marine beach deposits, comprising of sand and gravel are present on the site and surrounding shoreline[81].

The site is underlain by a moderately productive aquifer of sandstone, partly pebbly with subordinate siltstone and mudstones yielding moderate amounts of groundwater. Groundwater at the site is classified under the Water Framework Directive (WFD) monitoring programme as belonging to the West Kilbride groundwater body (ID: 150534) and has an overall classification of 'Good'.

A review of Marine Scotland data[82] outlines that sandy and muddy sand is the dominant seabed deposit within the surrounding area. A review of a study undertaken of the site and surrounding area by EnviroCentre in 2010 indicated that sediments in the north of Southannan Sands are coarser with exposed cobbles and gravel, while finer sands and some mud are present in the south of Southannan Sand and within the dredged areas/ sheltered area closet to the site.

9.5.4 Hydrology, Water Quality, Groundwater Dependant Terrestrial Ecosystems and Water Body Status

The site itself forms a small, well defined, self-contained catchment area for surface water runoff. Any rainfall falling on the site will either runoff into the dry dock or towards the shoreline, depending on the location. No surface watercourses connect to the site. An active pumping station is present on the site, preventing the accumulation of water within the dry dock. Two piped outfalls are present which discharge into the coastline, one on the western boundary and one on the northern corner adjacent to the quay.

Out with the site Burn Gill discharges into the shoreline south-west of Hunterston Ore Terminal (located east of the site) and Glen Burn immediately south of the Ore Terminal. Some smaller surface water features also discharge into the shoreline between Hunterston Ore Terminal and Hunterston Power Station. As these are not connected to the site at Hunterston Construction yard these are not considered to be sensitive receptors.

Hydrological features are shown in Figure 9.1 within Volume 2 of this EIAR.

The coastal waters adjacent to the site are classified under the WFD monitoring programme as Largs Channel (Fairlie Roads) a coastal waterbody (ID: 200026). The waterbody is classified as being of overall 'Good' status in 2012, with a hydromorphological and water quality status of 'Good'. The only watercourse that discharges into the large Channel is Gogo Water located north-east in Largs, which is classified as being overall 'Moderate', with a water quality status of 'Good' and a hydromorphological status of 'Moderate'.

Previous turbidity measurements undertaken by EnviroCentre at the Construction yard showed the water locally to be clear, with no suspended solids recorded (<5mg/l) during the summer months, whilst occasional short bursts of increased turbidity appear to be associated with small amplitude wave action.

There are two designated Bathing Waters close to the site, Pencil Beach, Largs (~4.5km) and Millport, Great Cumbrae (~1.7km). SEPA has monitored the water quality in these areas since 2000 due to their general recreational use. In 2023 Pencil Beach was designated as 'Good' quality and Millport as 'Excellent' quality.

[80] NatureScot. Southannan Sands SSSI. Available at: https://sitelink.nature.scot/site/10261
[81] British Geology Survey 1:50,000 Geology of Britain Viewer. Available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html)
[82] Marine Scotland. Map viewer. Available at: https://marinescotland.atkinsgeospatial.com/nmpi/

9.5.5 Tidal Water Levels

The closest standard port referenced in Admiralty tide tables is Millport, Great Cumbrae[83]. Tidal water levels at Millport as presented within the Admiralty tide tables are shown in **Error! Reference source not found.**. The mean tidal range at Millport is 3.0m for spring tides and 1.7m for neap tides.

Table 9-5: Tidal Range at Millport

Tide Condition	Chart Datum (mCD)	Ordnance Datum (mOD)
Highest Astronomical Tide (HAT)	3.9	2.28
Mean High Water Springs (MHWS)	3.4	1.78
Mean High Water Neap (MHWN)	2.7	1.08
Mean Sea Level (MSL)	2.0	0.38
Mean Low Water Neap (MLWN)	1.0	-0.62
Mean Low Water Springs (MLWS)	0.4	-1.22
Lowest Astronomical Tide (LAT)	-0.1	-1.72

*Chart datum correction for Ordnance Datum is -1.62 (relative to OD at Newlyn)

Extreme sea levels have been predicted around the whole UK coastline and published by the Environment Agency / Department for Environmental Food and Rural Affairs report[84] and updated in 2018 as the Coastal Flood Boundary (CFB) Dataset[85]. These CFB extreme levels include the effects of both tides and storm surge, and amplification within estuaries or sea lochs.

The CFB extreme sea levels, predicted at the closest point to the site within Largs Channel, are 3.65 mAOD for the 1 in 200 year return period event and 3.97 mAOD for the 1 in 1,000 year return period event. SEPA recommend a 2100 climate change uplift of 0.85m for coastal levels in the Clyde Region. Therefore the 1 in 200 year return period plus climate change event at the prediction location has a level of 4.5 mAOD and the 1 in 1000 year return period plus climate change event has a level of 4.82 mAOD.

9.5.6 Coastal Processes

9.5.6.1. Tidal Currents

Tidal current speeds in Hunterston channel, and wider Firth of Clyde, are generally slow, with mid depth velocities in the vicinity of the site not expected to exceed 0.3m/s.

A coastal hydrodynamic modelling study has been undertaken as outlined in Technical Appendix 9.1, Volume 3 of this EIAR. The modelling study shows that current speeds vary locally from above 0.5 m/s in the main tidal stream within the deeper water of Hunterston Channel, to less than 0.05 m/s in the shallow margins of Southannan Sands. Maximum current speeds in the proposed dredge area are just under 0.3 m/s. Highest current speeds are observed around mid-ebb and mid-flood during spring tides. The position of peak current speed in the main tidal stream varies between the flood and ebb tide. Slack water dominates towards high and low water. Wave action in shallow water (<10m) can generate strong flows during storm conditions or with an incoming swell. A combination of tidal currents and wave action will produce the highest energy conditions in the vicinity of the site, with the greatest potential for sediment transport.

9.5.6.2 Wave Climate

The site is situated within the Firth of Clyde which is relatively sheltered from incoming large swell waves, by the surrounding mainland, and the presence of islands, which will limit wave fetch and reduce the wave energy. Wind waves will have a similarly limited fetch although the direction of the largest fetch will generally be from a south-westerly direction.

Waves reaching Southannan Sands and the site will be subject to refraction and shoaling, reducing their energy. The effects of these processes increase in a southerly direction within Southannan Sands.

The spectral wave modelling study presented in Technical Appendix 9.1, Volume 3 of the EIAR highlights that offshore of the construction yard, towards the Hunterston channel, the highest significant wave heights can be expected to occur during wind from the 240° sector, with wind from the 270° sector also producing similar wave heights. In this area modelled 5-year return period (RP) significant wave heights range between 2.0 m and 2.5 m under wind forcing from the 240° sector, and also under wind forcing from the 270° sector. Modelled wave heights reduce shoreward into the SSSI for all wind forcing sectors, with the 300° sector and 330° sector producing the largest waves on Southannan Sands for the modelled 5-year return period (RP) event, with predicted significant wave heights of 1.25m towards MLWS, reducing southwards towards 0.1m.

9.5.6.3. Morphology and Sediment Transport

As outlined in section 9.5.3 the dominant sediment deposit in Hunterston Channel is sand, with coarser sand (medium) in the northern areas of Southannan Sands and finer sand to the south and around the site. The European Nature Information System (EUNIS) seabed habitat map shows the dominant seabed habitat around the site to be infralittoral and offshore circalittoral seabed habitats[86].

At Southannan and Hunterston Sands there is a large thickness of Pleistocene deposits overlying rockhead. Boreholes from the Hunterston Terminal have shown these to be largely fluvioglacial in origin, but there are areas where large boulders lie on the seabed, winnowed from Pleistocene deposits by recent marine action, and likely arising from ice-rafting from the retreating ice-fronts within the Late Devensian glacial lake that occupied this area.

As further described in Technical Appendix 9.1, Volume 3 of the EIAR, review of bedload transport suggests the transport of finer gravel by waves is intermittent, typically occurring during storm conditions and moving sediment landwards. Bedload transport of sand from tides alone will only occur during spring tides and transport rates would not be expected to be rapid. Combined tide and wave action will typically occur for most of the time, particularly in shallow water where sediment can be moved in both directions. In deeper water where there is less refraction bedload transport by waves is dominant, with waves from the south-west moving sediment north-east.

A review of dynamic coast web maps[87] highlights that the coastline local to Hunterston has generally stayed stable over time. It is noted that the main changes to mapped MHWS are related to industrial development and land reclamation, including for the subject site.

As outlined in Technical Appendix 9.1, Volume 3 of the EIAR, a comparison of bathymetry data from 1852[88] with more recent data, highlights that the low water mark has moved seawards over time to the south of the site as a result of sediment accumulation, whilst the low water mark has retreated shoreward to the north of the site at Southannan Sands, exposing some Pleistocene deposits. It is considered that adjacent deposition of medium sand is derived from erosion of these exposed outcrops and onward wind and wave bedload transport. A review of the bedload transport directions corresponds with the changes observed in the low water mark over time. Bedload material being moved in a north-easterly direction by waves is getting captured to the south of the site where sand

[83] UK Hydrographic Office, 2024 (Admiralty Tide Tables – Volume 1B)
[84] McMillan et al, 2011. Coastal Flood Boundary Conditions for UK Mainland and Islands. Environment Agency.
[85] Environment Agency, 2019. Coastal flood boundary conditions for the UK: 2018 update
[86] EUNIS 2017. Available at : https://emodnet.eu/en
[87] Dynamic Coast, 2023. Web Maps. Available at: https://www.dynamiccoast.com/
[88] Firth of Clyde Admiralty Chart (1852). Available at https://maps.nls.uk/

is accumulating. This is then restricting the supply of sediment to the north where exposure of the coastal fringe has resulted in localised erosion and retreat of the low water mark.

Fine and very fine sand generated from erosion and attrition within the surrounding area is typical transported by suspension. These deposits are transported rapidly and fall out of suspension in deeper slacker waters (previous dredge area at quay) or sheltered area (Fairlie Sands to the east). In the sheltered area to the east 0.2-0.3m of material have accumulated over 40 years. This suggests transport of sediment by suspension is slightly greater than bedload transport. The limited bedload transport in the area suggests transport is slow and there is a no strong feed of sand onto Southannan sands to the north of the site.

Technical Appendix 9.1, Volume 3 of the EIAR details a comparison of bathymetry data within the proposed dredge area from 2018 with more recent data captured in 2023. This highlights a spatially varying pattern of shallow deposition and shallow erosion, with locally deeper pockets of deposition associated with historic dredging, and an average deposition depth of 0.12m over a 5 year period, equivalent to an average deposition rate of 2.5cm per year. The total volume of deposition over the 5 year period equates to approximately 28,500 m^3. This is further indicative of limited bedload transport in the area, with limited deposition of fines from suspension the dominant process.

9.5.7 Flood Risk

As noted within section 9.5.4 there are no watercourse present on the site or that discharge onto the site. The two noted watercourses (Burn Gill and Glen Burn) discharge into the coastline east of the site and any noted fluvial flooding from these are contained on the mainland. A review of SEPA flood maps shows that the lower lying internal area (dry dock) is at risk of coastal flooding. This prediction does not account for the presence of the bund structure, the potential effects of climate change, local bathymetry or wave action. Small areas of pluvial flooding are also present within the site, generally corresponding to low lying areas on the site (such as dry dock)[89].

Tidal water levels, and extreme tidal water levels, are described in section 9.5.5 with an identified 1 in 200 year extreme tidal water level of 3.65 mAOD at the proposed development. SEPA recommend a 2100 climate change uplift of 0.85m for coastal levels within the Clyde basin region[90]. Therefore the 1 in 200 year return period plus climate change event at the prediction location has a level of 4.5 mAOD and the 1 in 1000 year return period plus climate change event has a level of 4.82 mAOD.

Technical Appendix 9.1, Volume 3 of the EIAR, presents details of spectral wave modelling undertaken in support of the EIAR. The results of this modelling exercise indicate possible largest 1 in 200 year joint probability significant wave heights in the vicinity of the proposed development of just under 3m, occurring with a joint probability water level approximating to highest astronomical tide (2.28 mAOD).

Operational management plans will be required to mitigate the risk to site personnel, and operations, from coastal flooding, including wave overtopping. Where possible the development design should consider coastal flooding predictions, however it is noted that the development design, including position and platform elevations, will be dictated by operational requirements. Given the intended use of the proposed development it is defined as a water compatible development, as per the classification outlined in SEPA landuse vulnerability guidance[91]. On this basis the impacts associated with flood risk is scoped out of further assessment and will not be considered further within the EIAR.

9.5.8 Future Projections and Effects on Climate Change

The UK government has published a range of climate projection reports and data for use in the assessment of climate change risks to help plan how to adapt to a changing climate. The latest set of comprehensive reports produced by UK Climate Projections (UKCP18) was published in 2018 and provides future climate projections for land and marine regions for the UK.

The UKCP18 projections are presented for a range of different scenarios or Representative Concentration Pathways (RCPs). RCPs are a method for capturing assumptions required on future economic, social and physical changes to our environment that will influence climate change. The increase in in global mean surface temperature (°C) by 2081 – 2100 for the different RCP's is outlined below:

- RCP2.6 = 1.6°C (0.9 – 2.3°C)
- RCP4.5 = 2.4°C (1.7 – 3.2°C)
- RCP6.0 = 2.8°C (2.0 – 3.7°C)
- RCP8.5 = 4.3°C (3.2 – 5.4°C)

Figure 9-1 UKCP18 RCP presents the predictions for carbon dioxide concentrations, along with resulting changes in global mean surface temperatures. Figure 9-2 UKCP18 RCP presents predictions for time-mean sea level change based on an average of UK ports, along with the spatial pattern of sea level change around the UK coastline at year 2100. Review of these predictions highlights that the proposed development is within a zone of lower sea level change in a UK context.

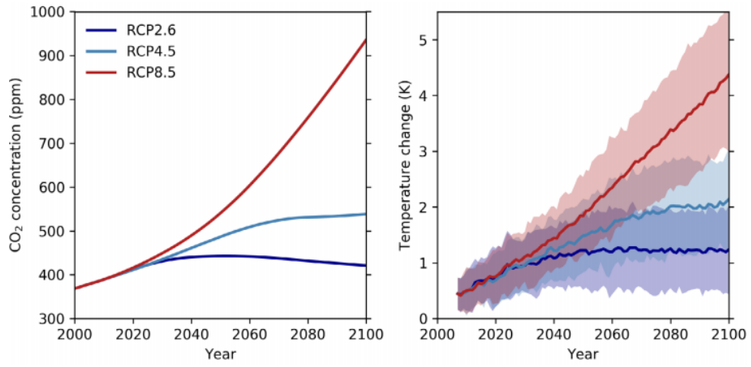


Figure 9-1: UKCP18 RCP predictions over the 21st century for carbon dioxide concentrations (left) and global mean surface temperature change resulting from carbon dioxide and other climate forcings (right)

[89] SEPA, 2023. Flood Maps. Available at: https://scottishepa.maps.arcgis.com/apps/webappviewer/index.html?id=2ddf84e295334f6b93bd0dbbb9ad7417
[90] Climate change allowances for flood risk assessment in land use planning Version 2. SEPA, 2022.
[91] Flood Risk and Land Use Vulnerability Guidance, Version 4. SEPA, 2018. https://www.sepa.org.uk/media/143416/land-use-vulnerability-guidance.pdf

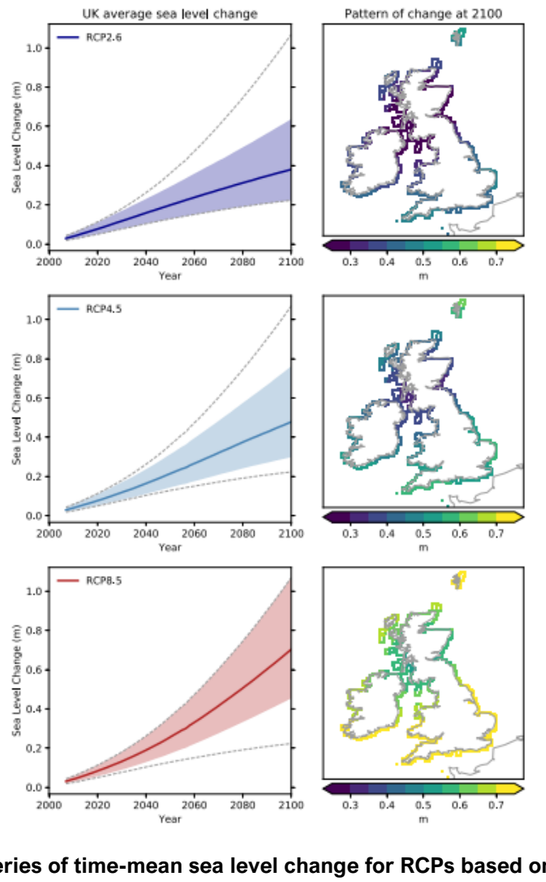


Figure 9-2: UKCP18 time series of time-mean sea level change for RCPs based on average of UK ports (left) and the spatial pattern of change at 2100 (right)

It should be noted that there is a wide range of uncertainty associated with these projections, and that these values represent an average relative sea-level rise across a range of return period scenarios. Under the United Nations Climate Change Paris Agreement the UK is committed to attempt to hold the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit warming to 1.5°C. These targets are in line with those allowed for within UKCP18 RCP 2.6, or the lower end of RCP 4.5, in terms of median global temperature increase by 2100.

The UKCP18 values for sea-level rise at the proposed development have been obtained based on the best available guidance. Cumulative rise from 2017 to 2100 for the region within which the proposed development is 0.28 m, derived from the 95th percentile estimate for RCP8.5, which are considered to provide an appropriate time period for the proposed works at Hunterston.

9.5.8.1 Wind

The UKCP18 wind speed analysis concludes that there are no compelling trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. The global projections over the UK show an increase wind speeds over the UK for the second half of the 21st century for the winter, associated with an increase in frequency of winter storms over the UK, while overall there is no trend in the wind speed over the UK. The Marine Climate Change Impacts Partnership (MCCIP)[92] highlights the poleward shift in the storm track since the 1990s and an increase in number of storms, but notes that the mechanisms are poorly understood, and that natural variability will likely continue to dominate storm conditions for the next few decades.

9.5.8.2. Waves

The likely impact of climate change on wave height remains an area of significant uncertainty. The SEPA climate change guidance (SEPA, 2019) does not provide recommended allowances. It is noted that the size of waves at the coast is often limited by depth of water, and therefore sea level is likely to have a greater impact on wave overtopping. The guidance recommends that wave model sensitivity to offshore wave height is tested through an increase of 10 – 20% in offshore wave height to account for changes as a result of climate change. MCCIP[92] notes that mean significant wave height has reduced in the north of the UK over the last 30 years, and that whilst the most severe waves could increase in height as a result of climate change, particularly under a high-emissions scenario, there could be an overall reduction in mean significant wave height in the North Atlantic.

9.5.9 Sensitive Receptors

On the basis of the baseline assessment the sensitive receptors to potential impacts on the water environment, soils and coastal processes have been identified as the coastal waters and sediment of the proposed development (and immediate surrounds), the waters of the wider Firth of Clyde, the Southannan Sands SSSI site which bounds the proposed site to north, east and south, the Kames Bay and Ballochmartin Bay SSSIs, and the Hunterston B cooling water intake. Consideration of associated ecological receptors is included within Chapter 5, Biodiversity.

9.6 Receptor Sensitivity

On the basis of the baseline assessment, Table 9-6 identifies the receptor sensitivity.

Table 9-6: Receptor Sensitivity

Receptor	Sensitivity	Comment
Coastal waters and sediment of Largs Channel (Vicinity of Site)	Medium	Largs channel classified as 'Good' overall on the WFD. Navigation waterbody used by commercial and recreational vessels.
Coastal waters and sediment of Wider Firth of Clyde	High	Navigation waterbody used by commercial and recreational vessels. Two designated bathing waters by SEPA present in Largs and Millport.
SSSI Southannan Sands	High	One of the best examples of an intertidal skinflat within the Clyde coastal cell, designated as SSSI intertidal marine habitats, saline habitats and sandflats.
SSSI Kames Bay	High	The designated interest of the site are the flora and fauna of the intertidal area (the area between the highest and lowest tidal levels) which is of national importance.
SSSI Ballochmartin Bay	High	The designated interest of the site are the flora and fauna of the intertidal area (the area between the highest and lowest tidal levels) which is of national importance.

[92] Marine Climate Change Impacts Partnership Website (https://www.mccip.org.uk/storms-and-waves)

Receptor	Sensitivity	Comment
EDF Energy Cold Water Intake	High	Hunterston B Power Station utilises the sea as a source of cooling water for plant systems.

9.7 Impact Assessment

9.7.1 Potential Impacts

This section identifies the potential impacts on the water environment, soils and coastal processes, at and around the site during construction and operational phases of the development.

The proposed works will involve the following key activities which have the potential to impact on the water environment within the site and surrounding area:

- Dredging of new quay approach and berths;
- Construction activities (removal of existing structures on site, removal and construction of bunds, quay construction, required site infrastructure (welfare, storage areas, upgrades to access track);
- Activities associated within infilling of dry dock (removal of concrete base, infilling with dredge material and dewatering); and
- Drainage within new quay wall;

The potential impacts on the water environment and coastal processes include:

- Hydrological alteration including increased runoff and alteration of flow patterns;
- Contamination of coastal waters, sediment and SSSI Southannan Sands through spillages, leakages and sediment transfer (oils, fuels, welfare facilities and suspended solids;
- Changes in local wave climate;
- Changes in local tidal regime;
- Changes in local sediment transport regime;
- Associated impacts on the intertidal habitat of SSSIs; and
- Associated impacts to Hunterston B, in particular the cold-water intake.

The potential interaction between the water environment impacts and ecology, including in relation to the Southannan Sands SSSI, are assessed within Chapter 5, Biodiversity.

The following section consider the potential impacts and provide an assessment of likely level of significance.

9.7.2 Construction Phase

The potential impacts are assessed under the following headings:

- Hydrology;
- Water and sediment quality;
- Tidal regime;
- Wave climate; and
- Morphology.

The potential degree of environmental impact is provided as appropriate.

9.7.2.1 *Hydrology*

Surface Water

As noted in section 9.5.4 the site has a small defined catchment for surface water runoff from rainfall, with no watercourses discharging or flowing within the site. Currently, rainfall runoff either discharges to the coast, infiltrates, or collects within the lower area within the centre of the site (dry dock) and is pumped out to coastal discharge. During construction the dry dock will be infilled and the bund to the west will also be removed. This will change the overland flow pathways on the site, removing a low point where water currently accumulates. Increasing this ground level could results in more overland flow towards the coastline. New drainage outfalls will be constructed within the quay wall. Drainage of the site will be connected into these piped outfalls discharging the majority of runoff to coastal waters.

During construction there is potential for increased run-off due to the introduction of impermeable and semi-permeable surfaces arising from the compaction of soils, infilling and construction of proposed infrastructure. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential environmental effect of this is to increase or alter surface water flow rates and routes, potentially leading to increases in erosion and sediment transport.

Whilst infilling of the dry dock is set to take place, resulting in a change to current overland flow paths and discharge mechanisms, due to the small catchment of the site, the existing presence of significant impermeable surfaces, and the existing mechanism of discharge to coastal waters, it is considered that the magnitude of impact of increased or altered surface water flows to coastal waters in the vicinity of the site would be of negligible magnitude, which would give rise to a potential effects of negligible significance overall, prior to mitigation.

9.7.2.2 *Water and Sediment Quality*

During the construction phase the proposed development has the potential to impact both water and sediment quality through the capital dredge campaign, the subsequent disposal of dredged material (including dewatering), and the potential for pollution incidents.

Water Quality - Sediment Discharge and Dispersion from Dredging Works

The capital dredge campaign could potentially cause plumes of suspended solids and a reduction in water quality which could impact on the adjacent coastal waters (Largs Channel), currently classified as having a ‘Good’ overall status under the WFD, the designated intertidal sandflat habitats of the Southannan Sands SSSI and the designated bathing waters at Millport.

The key risk is considered to be an increase in suspended solids during the dredging activity, which is assessed in the following paragraphs, by sensitive receptor, informed by the modelling assessment described in Technical Appendix 9.1, Volume 3 of the EIAR. For the purposes of the dredging modelling it has been assumed that all works will be undertaken by a trailer suction hopper dredger as this is considered to be a worst case option with respect to the potential release of suspended solids during the dredge activity. The model results highlight that due to the relatively coarse nature of the material to be dredged, and the weak tidal currents within the vicinity of the proposed dredge pocket, plumes generated as a result of the dredging works will be localised in extent and short term in duration. Due to the low current speeds, any sands and gravels lost to the water column during dredging will fall out of suspension immediately, within the dredge footprint. Clay and silt lost to the water column during dredging will remain in suspension for longer, being dispersed gradually over the tidal cycle.

Coastal waters and sediment of Largs Channel (Vicinity of Site)

The modelled assessment has indicated no significant deposits of sediment in the wider Largs Channel (<0.001m thickness of material) outwith the dredge pocket.

There is noted to be an increase in total suspended sediment (TSS) concentration primarily in the dredge pocket and adjacent Hunterston Channel, for the duration of the dredge campaign. For the majority of the dredge campaign TSS concentrations at any particular location within the dredge pocket and immediate surrounds are predicted to remain below 0.1kg/m^3, with shorter periods of higher TSS (0.1 – 0.8kg/m^3) occurring locally around the working position of the dredger. Predicted statistical mean TSS levels within the dredge pocket range between 0.01 to 0.03kg/m^3, and within the adjacent Hunterston Channel between 0.004 to 0.02kg/m^3. Elevated levels of TSS are noted to return to baseline levels shortly following completion of the activity (<10 days). On this basis the impact is considered to be of negligible magnitude, for a short duration, resulting in effects of negligible significance, prior to mitigation.

Coastal waters and sediment of Wider Firth of Clyde

The modelled assessment has indicated no significant deposits of sediment in the wider Firth of Clyde (<0.001m thickness of material).

An increase in TSS concentrations is noted to be localised to the immediate channel beside the site, as described in the section above, and the intertidal areas to the north and east of the site, as described below. It is noted to return to baseline levels shortly following completion of the activity (<10 days). On this basis the impact is considered to be of negligible magnitude, resulting in effects of negligible significance, prior to mitigation.

Southannan Sands

The modelled assessment has indicated no significant deposits of sediment in the Southannan Sands SSSI (<0.001m thickness of material).

There is noted to be an increase in TSS concentrations towards the middle of the dredge programme when the dredge is modelled to be working in waters closer to the HCY. The dredge plume is noted to move into the SSSI area to the north of the HCY with tidal movements pulling and pushing the plume in and out of this area. On the basis of the modelled exercise elevated levels of TSS (>0.01kg/m^3) are noted in the waters in this area for approximately 8 weeks. During this period TSS concentrations range between 0.01 and 0.35kg/m^3 at key sensitive receptors on Southannan Sands, with statistical mean TSS concentrations between 0.01 and 0.03kg/m^3 over the duration of the dredge campaign. It is noted that TSS concentrations are predicted to return towards baseline levels shortly following completion of the activity (approximately 10 days). On this basis the impact is considered to be of negligible magnitude for a short duration, resulting in effects of negligible significance, prior to mitigation. Detailed impact assessment in relation to the ecological receptors present is detailed in Chapter 5.

Kames Bay

The modelled assessment has indicated no significant deposits of sediment in Kames Bay (<0.001m thickness of material).

The modelling has not identified a significant plume migration to Kames Bay, with predicted statistical maximum TSS concentrations of <0.01kg/m^3 and statistical mean TSS concentrations of <0.005kg/m^3 over the duration of the capital dredge campaign. On this basis the impact is considered to be of negligible magnitude, giving rise to effects of negligible significant, prior to mitigation.

Ballochmartin Bay

The modelled assessment has indicated no significant deposits of sediment in Ballochmartin Bay (<0.001m thickness of material).

The modelling has not identified a significant plume migration to Ballochmartin Bay, with predicted statistical maximum TSS concentrations of <0.005kg/m^3 and statistical mean TSS concentrations of <0.003kg/m^3 over the duration of the capital dredge campaign. On this basis the impact is considered to be of negligible magnitude, giving rise to effects of negligible significant, prior to mitigation.

Hunterston B Cold Water Intake

The modelled assessment has indicated no significant deposits of sediment in the area of cold water intake (<0.001m thickness of material).

The modelling has not identified a significant plume migration to the Hunterston B Cold Water Intake, with predicted statistical maximum TSS concentrations of <0.0025kg/m^3 and statistical mean TSS concentrations of <0.0015kg/m^3 over the duration of the capital dredge campaign. On this basis the impact is considered to be of negligible magnitude, giving rise to effects of negligible significant, prior to mitigation.

Sediment Quality – Sediment Discharge from Dredging and Disposal

The construction works incorporates dredging works of the seabed to -12mCD. To inform the dredging activity and support the licence application overwater site investigation works have been undertaken incorporating sediment sampling and analysis in line with the Marine Directorates Pre-Disposal Sampling Guidance[93]. In support of the Dredge and Disposal Licence Application a Best Practicable Environmental Options (BPEO) Appraisal has been produced and is provided as Technical Appendix 9.2

The BPEO assessment identified that although there are some contaminants of concern in individual sediment samples above the Revised Action Level (RAL)1, the average of the analytical results for the material records concentrations below RAL1. It is therefore considered that the chemical quality of the sediment will not contribute to an overall degradation of water quality at the dredge or disposal site(s) as the potential for dilution and attenuation in the Firth of Clyde is very considerable.

The key contaminants for impacting water quality are considered to be metals as these have the potential to dissolve/desorb from sorption sites, it is noted that none of these were recorded over the RAL1 in the sediment samples. Organic contaminants (e.g. PCBs and PAHs) have a greater affinity for the organic materials which they are bound to, and are more likely to remain strongly bound to the sediment, or if they become dissolved, quickly adsorbed onto organic matter within the water column or sediments. There were some PAH concentrations within individual sediment sample results which exceeded RAL1, however the average of the material did not exceed RAL1.

Following a review of the chemical quality of the sediment, the associated risk from chemical contaminants to cause degradation of water quality directly associated with the proposed dredging and disposal is considered to be Low i.e. unlikely to cause a significant adverse effect on the overall water quality.

Water and Sediment Quality - Dry Dock Infilling

Dewatering of dredge material will take place during infilling of the dry dock. This discharge will be licensed by SEPA as a trade effluent discharge under the Controlled Activities Regulation. As such the discharge will require to meet the conditions of the licence with respect to chemical and suspended solid release. The discharge will be made to the west of the site and will not be within the SSSI.

Prior to mitigation measures it is considered that the magnitude of impact of pollution to coastal waters and designated sites from infilling would be of a negligible magnitude within the immediate vicinity of dewatering and negligible magnitude out with this area, which would give rise to a potential effect of negligible significance.

[93] Marine Scotland Pre-Disposal Sampling Guidance Version 2 November 2017

Water and Sediment Quality - Pollution Incidents

During construction there is a risk of accidental pollution incidences affecting the water environment (i.e. coastal waters, sediment, SSSI and designated bathing waters) from the following sources:

- Spillage or leakage of oils and fuels stored on site;
- Spillage or leakage of oils and fuels from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site;
- Spillage or leakage from on-site toilet facilities;
- Suspended solids from construction works; and
- The use of concrete and cement in construction works.

The main risk is considered to be posed by refuelling activities. Oil or fuel spillages to the water environment would be detrimental to water/sediment quality and could affect fauna and flora.

Concrete (specifically the cement component) is generally highly alkaline and any spillage to the water environment and/or soils could be detrimental to water/sediment quality, fauna and flora.

This impact of a spillage or concrete runoff would be particular detrimental is if a spillage was to enter into the SSSI Southannan Sands which borders the site to the south, east and north.

The effect of the potential pollution incidences during construction on water quality would be dependent on the scale and nature of the incident, therefore the magnitude of impact may range from low to high prior to mitigation which would give rise to a potential effect of minor to major significance.

10.7.2.3. Tidal Regime

The proposed construction works could result in alterations to local tidal levels and currents. During the construction phase the greatest potential for impact would occur towards the end of the construction process, where the dredge pocket and quay wall are in place. All stages of construction prior to this would have a more limited footprint, and thus more limited potential for impact.

Hydrodynamic modelling results presented within Technical Appendix 9.1, Volume 3 of this EIAR, highlight that the proposed development would have no impact on tidal water surface elevations. The model results show that minor changes in peak current speed are predicted at point output locations in the dredge pocket and immediate vicinity (<0.2m/s change), with no change observed in the wider surrounds, including within the adjacent SSSI.

Minor decreases (<0.2m/s) in peak current speed are predicted on the south-western edge of the dredge pocket, during both the ebb and flood spring tide. Smaller localised areas of limited current speed increase (<0.2m/s) are predicted at peak ebb spring tide only, considered associated with local re-routing of preferential flow paths as a result of the removal of rock armour slopes and construction of the quay wall. During other phases of the spring tide, and during neap tides, the predicted changes are reduced further.

Overall, the model results show that a relatively low energy tidal climate of low current speeds remains, with similar character to the existing baseline conditions.

It is considered that prior to mitigation the magnitude of impact of the proposed development on the local tidal regime will be of negligible magnitude, resulting in effects of negligible significance, prior to mitigation.

9.7.2.3 ***Wave Climate***

The proposed construction works could result in alterations to the local wave climate. During the construction phase the greatest potential for impact would occur towards the end of the construction process, where the dredge pocket and quay wall are in place. All stages of construction prior to this would have a more limited footprint, and thus more limited potential for impact.

Wave modelling results presented within Technical Appendix 9.1, Volume 3 of this EIAR, highlight that the proposed development would result in minor changes to significant wave heights (Hs) in the immediate vicinity of the dredge pocket. For waves approaching from the south, with wind from the 180 degree sector, during a 1 in 5 year return period event, increases in significant wave height of <0.5m are predicted in the immediate vicinity of the dredge pocket. A limited area of wave height increase (<0.2m) is predicted to extend north-east towards the edge of the Southannan Sands. For waves approaching from the south, with wind from the 240 degree sector, during a 1 in 5 year return period event, increases in significant wave height of <1.0m are predicted in the immediate vicinity of the dredge pocket, with a limited area of wave height increase (<0.5m) extending around the corner into the hammerhead quay area. For wave scenarios with wind from north-western and northern sectors predicted increases in significant wave height are limited to the immediate vicinity of the quay wall.

No impact to wave climate is predicted in the wider area as a result of the proposed development. Predicted changes to significant wave heights in the immediate vicinity of the proposed development are not considered to result in wave heights significantly different to those occurring under baseline conditions.

On the basis of the model results, the magnitude of impact on the wave climate is considered to be of negligible magnitude, giving rise to effects of negligible significance, prior to mitigation.

9.7.2.4 ***Morphology***

The proposed construction works could result in alterations to local morphology, including sediment transport processes and bathymetry, through cumulative impacts to tides and waves, as well as direct physical impacts related to dredging activities. During the construction phase the greatest potential for impact would occur towards the end of the construction process, where the dredge pocket, including side slopes, and quay wall are in place. All stages of construction prior to this would have a more limited footprint, and thus more limited potential for impact.

Sediment Transport Processes

The proposed works are within a zone that has historically been dredged, and partly as a result, remains a low energy, depositional environment with limited sediment connectivity to the adjacent Southannan Sands. As described in section 9.5.6, and further detailed in Technical Appendix 9.1, Volume 3 of the EIAR, there is no significant bedload transport within the immediate vicinity of the proposed dredge pocket, with deposition of fine material from suspension the dominant sediment transport process. The proposed development is not predicted to alter these existing conditions.

The sediment transport regime is driven by the tidal regime and wave climate, along with availability of sediment. The modelling results, as described in preceding sections, and detailed in Technical Appendix 9.1, Volume 3 of the EIAR, have demonstrated that there will be no significant impact to either the tidal regime or the wave climate as a result of the proposed development.

In the absence of significant sediment transport processes, and given the negligible impact on tidal velocities predicted by the hydrodynamic modelling, and limited localised impact to wave climate predicted by the wave modelling, as detailed in the sections above, it is considered that beyond additional potential for deposition of fines within the dredge pocket, there will be a negligible cumulative impact on sediment transport processes, including within the adjacent SSSI, resulting in effects of negligible significance, prior to mitigation.

Dredge Pocket Side Slope Relaxation

The NatureScot Scoping Response incorporated the following commentary in relation to the dredge pocket and potential for side slope relaxation:

The drawings of "dredge option - General Arrangement Plan" include a note that the dredge-area side slopes will be created with a "min acceptable gradient of 1:3 (vertical:horizontal)". We suggest that the slopes might over time 'relax back' in a way that (depending on the extent of the dredge area) erodes material from MLWS at the SSSI boundary. Therefore potential effects of side-slope relaxation on the SSSI sandflat feature should be assessed as a separate operational-phase effect. Potentially this could require a full geotechnical assessment.

Since the Scoping submission there has been ongoing design work, as a result the maximum dredge pocket extent has now been reduced as detailed on Arch Henderson Drawing HMY-AHN-00-00-DR-C-9100 provided in Volume 2 of this EIAR. The closest edge of the reduced dredge pocket being assessed within this EIA is 278m from the SSSI boundary.

The dredge pocket design has also changed to have shallower edges (1 in 6 as noted on Arch Henderson Drawing HMY-AHN-00-00-DR-C-9100 provided in Volume 2 of this EIAR).

On the basis of the reduction in the dredge area, the shallower slopes to the edge of the dredge pocket and the distance from the SSSI boundary it is considered that any side slope relaxation will have limited areal impact and as such it is very unlikely that slumping would subsequently result in impact to the SSSI edge. It is considered that dredge slope relaxation will therefore have a negligible impact on surrounding bathymetry, resulting in effects of negligible significance, prior to mitigation.

Dispersal and Deposition of Sediment from Dredge Plume

As outlined in section 9.7.2.2, the proposed capital dredge campaign is predicted to result in the generation of a dredge plume. Dispersal and eventual deposition of sediment from the dredge plume has the potential to impact local morphology, including sediment composition and bathymetry.

Dredge plume dispersal modelling undertaken in support of the EIAR, and detailed in Technical Appendix 9.1, predicts sediment deposition depths over the duration of the capital dredge, outwith the immediate dredge zone, and at all sensitive receptors, of less than 0.001 m (1 mm). Total net deposition accumulation over the dredge campaign is predicted to be less than 5 g/m^2 at most sensitive receptors, and less than 10 g/m^2 at all sensitive receptors.

Given the very limited depth of deposition predicted, and the associated limited net deposition accumulation, no significant change to bathymetry or sediment composition is predicted. It is therefore considered that dispersal and deposition of sediment from the dredge plume will have a negligible impact on surrounding morphology, resulting in effects of negligible significance, prior to mitigation.

9.7.3 Operational Phase

The potential impacts during the operational pages of the development are assessed under the following headings:

- Hydrology;
- Water and sediment quality;
- Tidal regime;
- Wave climate; and
- Morphology.

The potential degree of environmental impact is provided as appropriate.

9.7.3.1 *Hydrology*

As during construction, there is potential for increased run-off due to the presence of impermeable and semi-permeable surfaces. The impact of surface water flow alterations and increased run-off would be of a negligible magnitude prior to mitigation measures due to the small contributing catchment and coastal location of the proposed development, resulting in effects of negligible significance.

9.7.3.2 *Water and Sediment Quality*

During the operational phase the proposed development has the potential to impact both water and sediment quality through maintenance dredge requirements, the subsequent disposal of dredged material, and the potential for pollution incidents.

Water Quality - Sediment Discharge and Dispersion from Dredging Works

Maintenance dredging is likely to be required at the new quayside. The need for and frequency of maintenance dredging campaigns will depend on the future rate of sediment accretion and the draught of vessels using HCY. Clydeport, as the SHA, will undertake routine bathymetric surveys to monitor seabed levels and determine the need for maintenance dredging.

On the assumption that chemical quality remains similar at the site the key risk is considered to be an increase TSS concentrations during the dredging activity which is assessed as part of Technical Appendix 9.1 and the findings detailed below.

Coastal waters and sediment of Largs Channel (Vicinity of Site)

The modelled assessment has indicated no significant deposits of sediment in the wider Largs Channel (<0.001m thickness of material) outwith the dredge pocket.

There is noted to be an increase in total suspended sediment (TSS) concentration primarily in the dredge pocket and adjacent Hunterston Channel, for the duration of the dredge campaign. For the majority of the dredge campaign TSS concentrations at any particular location within the dredge pocket and immediate surrounds are predicted to remain below 0.02kg/m^3, with shorter periods of higher TSS (0.02 – 0.24kg/m^3) occurring locally around the working position of the dredger. Elevated levels of TSS are noted to return to baseline levels shortly following completion of the activity (<5 days). On this basis the impact is considered to be of negligible magnitude, for a short duration, resulting in effects of negligible significance, prior to mitigation.

Coastal waters and sediment of Wider Firth of Clyde

The modelled assessment has indicated no significant deposits of sediment in the wider Firth of Clyde (<0.001m thickness of material).

An increase in TSS concentrations is noted to be localised to the immediate channel beside the site, as described in the section above, and the intertidal areas to the north and east of the site, as described below. It is noted to return to baseline levels shortly following completion of the activity (<5 days). On this basis the impact is considered to be of negligible magnitude, resulting in effects of negligible significance, prior to mitigation.

Southannan Sands

The modelled assessment has indicated no significant deposits of sediment in the Southannan Sands SSSI (<0.001m thickness of material).

There is noted to be an increase in TSS concentrations towards the middle of the dredge programme when the dredge is modelled to be working in waters closer to the HCY. The dredge plume is noted to move into the SSSI area to the north of the HCY with tidal movements pulling and pushing the plume in and out of this area. On the basis of the modelled exercise elevated levels of TSS (>0.01kg/m^3) are noted in the waters in this area for approximately 5 days. During this period TSS concentrations range between 0.01 and 0.055kg/m^3 at key sensitive receptors on Southannan Sands. It is noted that TSS concentrations are predicted to return towards baseline levels shortly following completion of the activity (approximately 5 days). On this basis the impact is considered to be of negligible

magnitude for a short duration, resulting in effects of negligible significance, prior to mitigation. Detailed impact assessment in relation to the ecological receptors present is detailed in Chapter 5.

Kames Bay

The modelled assessment has indicated no significant deposits of sediment in Kames Bay (<0.001m thickness of material).

The modelling has not identified a significant plume migration to Kames Bay, with predicted maximum TSS concentrations of <0.002kg/m^3 over the duration of the maintenance dredge campaign. On this basis the impact is considered to be of negligible magnitude, giving rise to effects of negligible significant, prior to mitigation.

Ballochmartin Bay

The modelled assessment has indicated no significant deposits of sediment in Ballochmartin Bay (<0.001m thickness of material).

The modelling has not identified a significant plume migration to Ballochmartin Bay, with predicted maximum TSS concentrations of <0.001kg/m^3 over the duration of the maintenance dredge campaign. On this basis the impact is considered to be of negligible magnitude, giving rise to effects of negligible significant, prior to mitigation.

Hunterston B Cold Water Intake

The modelled assessment has indicated no significant deposits of sediment in the area of cold water intake (<0.001m thickness of material).

The modelling has not identified a significant plume migration to the Hunterston B Cold Water Intake, with predicted maximum TSS concentrations of <0.001kg/m^3 over the duration of the maintenance dredge campaign. On this basis the impact is considered to be of negligible magnitude, giving rise to effects of negligible significant, prior to mitigation.

Sediment Quality – Sediment Discharge from Dredging and Disposal

Sediment dredged during the maintenance dredge campaign would be recently deposited material. It is anticipated that the chemical and physical nature of the dredge arisings will therefore be similar to that of sediment currently located at the site and detailed in Section 9.7.2.2. Therefore, it is considered unlikely to be at risk of contamination or pose a risk of contamination to the surrounding environment.

The dredging campaign will require a Marine Directorate Maintenance Dredge and Disposal Licence. Sediment sampling, analysis and interpretation will be required to inform the licence application and as such risks related to this activity will be informed by this updated assessment.

Water and Sediment Quality - Pollution Incidents

There is unlikely to be any groundworks during the operational phase, and therefore the risk of sedimentation will be much lower than during construction. The potential risk of pollution as a result of spillages, will however remain during the operational phase. Outfalls will be installed at the site which will drain the quay area with the remainder of the site draining via natural percolation. There is therefore potential for impact to water quality as a result of contaminated materials being released from the site drainage.

Additionally, there is the potential risk of contamination of coastal waters as a result of discharges from boats. The impacts on water quality would therefore range from low to high magnitude prior to mitigation measures which would give rise to a potential effect of minor to major significance.

9.7.3.3 *Tidal Regime*

As during the construction phase, the operational phase of the proposed development could result in alterations to local tidal levels and currents.

The sub-tidal and inter-tidal operational character of the proposed development is considered to be the same as that of the late construction phase, with dredge pocket and quay wall in place. Operational phase maintenance dredging, where required, will be to maintain the design dredge pocket bathymetry, rather than alter it. On this basis, the impact of the proposed development during the operational phase on the tidal regime is considered to be the same as that assessed for the construction phase. Therefore, the magnitude of impact on the tidal regime is considered to be of negligible magnitude, giving rise to effects of negligible significance, prior to mitigation.

9.7.3.4 *Wave Climate*

As during the construction phase, the operational phase of the proposed development could result in alterations to local wave climate.

The sub-tidal and inter-tidal operational character of the proposed development is considered to be the same as that of the late construction phase, with dredge pocket and quay wall in place. Operational phase maintenance dredging, where required, will be to maintain the design dredge pocket bathymetry, rather than alter it. On this basis, the impact of the proposed development during the operational phase on the wave climate is considered to be the same as that assessed for the construction phase. Therefore, the magnitude of impact on the wave climate is considered to be of negligible magnitude, giving rise to effects of negligible significance, prior to mitigation.

9.7.3.5 *Morphology*

As during the construction phase, the operational phase of the proposed development could result in alterations to local morphology, including sediment transport processes and bathymetry, through cumulative impacts to tides and waves, as well as direct physical impacts related to dredging activities. The sub-tidal and inter-tidal operational character of the proposed development is considered to be the same as that of the late construction phase, with dredge pocket and quay wall in place. Operational phase maintenance dredging, where required, will be to maintain the design dredge pocket bathymetry, rather than alter it.

The impact of the proposed development during the operational phase on morphology, including sediment transport and bathymetry, is therefore considered to be largely the same as during the construction phase. Therefore, the magnitude of cumulative impact on sediment transport processes is considered to be of negligible magnitude, giving rise to effects of negligible significance, prior to mitigation. It is considered that dredge slope relaxation will have a negligible impact on surrounding bathymetry, resulting in effects of negligible significance, prior to mitigation.

The scale of any maintenance dredge requirement will be significantly reduced in comparison to the capital dredge. Dredge plume dispersal modelling undertaken in support of the EIAR, and detailed in Technical Appendix 9.1, predicts sediment deposition depths over the duration of the maintenance dredge, outwith the immediate dredge zone, and at all sensitive receptors, of less than 0.001 m (1 mm). Total net deposition accumulation over the dredge campaign is predicted to be less than 5 g/m^2 at most sensitive receptors, and less than 10 g/m^2 at all sensitive receptors.

Given the very limited depth of deposition predicted, and the associated limited net deposition accumulation, no significant change to bathymetry or sediment composition is predicted. It is therefore considered that dispersal and deposition of sediment from the dredge plume will have a negligible impact on surrounding morphology, resulting in effects of negligible significance, prior to mitigation.

9.8 Mitigation and Monitoring

Mitigation aims to avoid, manage, control and further minimise environmental impacts and is discussed within the following sections.

9.8.1 Construction Phase

9.8.1.1. General Management

A Construction Environmental Management Plan (CEMP) will be developed to ensure that the mitigation measures outlined in the EIAR are followed during the proposed construction works. The CEMP includes surface water management and pollution prevention measures (e.g. Pollution Prevention Plan) and will be in place during construction and operation. The CEMP will remain a live document and will be continually updated as the work progresses. The CEMP is a practical tool to facilitate the management of environmental mitigation measures and to provide a clear roadmap of the key roles and responsibilities during construction.

A suitably qualified Environmental Clerk of Works (EnvCoW) will monitor the construction works to ensure that the CEMP and associated mitigation measures are being implemented effectively.

Best practice will be adopted throughout all phases of development, following current guidance. The programme of works, including timing, direction and method of capital dredge and maintenance dredge, will be planned, monitored and managed to minimise the potential negative environmental impacts.

A Pollution Incident Response Plan will be developed relating to the construction of the proposed development, statutory requirements and identification of areas of highest sensitivity. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times.

All activities above Mean High Water Springs (MHWS) with potential to affect the water environment require to be authorised under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR). The level of authorisation required is dependent on the anticipated environmental risk posed by the activity to be carried out. These activities could include construction drainage. Construction activities below MHWS with potential to affect the water environment require to be authorised under a Marine Licence.

9.8.1.2 Dredging

Mitigation measures will be delivered by the principal contractor through detailed Construction Environment Management Plans (CEMPs) that will be produced following appointment. The contractor will be responsible for producing a site-specific Pollution Prevention Plan (PPP) that will apply the principles of the agreed mitigation to show how the mitigation is implemented effectively down to the specific site.

Chapter 5 details the impact assessment and subsequent mitigation requirements for specific ecological receptors, this assessment is informed by the dredge plume modelling undertaken in this Chapter.

9.8.1.3 Dewatering

Mitigation measures will be delivered by the principal contractor through detailed Construction Environment Management Plans (CEMPs) that will be produced following appointment. The location of the dewatering outfall will also be chosen to avoid sensitive areas and have minimal impact on the coastal environment. The discharge will be regulated by SEPA under the Controlled Activities Regulation which will detail the specific quality parameters which the discharge will require to meet. Specific water processing measures may be required to meet these discharge parameters.

9.8.1.4 Surface Water Management

As outlined previously permanent drainage infrastructure will be installed in the form of new outfalls in the quay wall. These will drain the quay area only. This will be regulated by SEPA under Controlled Activities Regulations including the requirement for any treatment to meet discharge parameters. For future drainage it is proposed that systems replicate natural drainage around construction areas and to use source control to deal with rainwater in proximity to where it hits the ground in line with current Sustainable Drainage Systems (SuDS) guidance. Suitable prevention measures will be in place at all times to prevent the release of pollutants to the water environment, including adjacent coastal waters. These will be regularly inspected and maintained to ensure optimal performance.

9.8.1.6 Concrete

In the case that concrete batching was to be undertaken on-site the following mitigation measures would be implemented to minimise the potential impact of concrete batching on the water environment in line with GPP6:

- Concrete batching will take place on an impermeable designated area and at least 10m from any waterbody.
- Equipment and vehicles will be washed out in a designated area that has been specifically designed to contain wet concrete/ wash water.
- A closed loop system will be used for wash waters. Wash waters will be stored in a contained lined pond for settlement before being reused (e.g. for mixing and washing).
- No discharge of wash waters will occur on-site. All excess wash water that cannot be reused will be disposed of off-site.

The following mitigation is proposed for concrete handling and placement:

- Pouring of concrete will take place within well shuttered pours to prevent egress of concrete from the pour area;
- Pouring of concrete during adverse weather conditions will be avoided.

The CEMP will include a Pollution Incident Response Plan, and drivers of vehicles carrying concrete will be informed so as to raise awareness of potential effects of concrete and of the procedures for clean-up of any accidental spills.

Concrete acidity (pH) will be as close to neutral (or site-specific pH) as practicable as a further precaution against spills or leakage.

9.8.1.7 Oil, Fuel, Site Vehicle Use and Storage

The risk of oil contamination will be minimised by good site working practice (further described below) but should a higher risk of oil contamination be identified then installation of an oil separator will be considered.

The storage of oil is considered a Controlled Activity which will be deemed to be authorised if it complies with the Regulations. The mitigation measures to minimise any risk of contaminant release are in line with SEPA GPP and PPG documents and include the following:

Storage:

- Storage for oil and fuels on site will be designed to be compliant with GPP2 and GPP8;
- The storage and use of loose drums of fuel on site will not be permitted; and
- Bunded tanks will provide storage of at least 110% of the tank’s maximum capacity.

Refuelling and maintenance:

- Fuelling and maintenance of vehicles and machinery, and cleaning of tools, will be carried out in a designated area where possible in line with PPG7;
- Multiple spill kits will be kept on site;
- Drip trays will be used while refuelling; and
- Regular inspection and maintenance of vehicles, tanks and bunds will be undertaken.

Emergency procedure: The Pollution Incident Response Plan will include measures to deal with accidental spillages.

9.8.2 Operational Phase

9.8.2.1 *General Management*

An Operational Environmental Management Document (OEMD) will be in place throughout the operational phase. Best practice will be followed throughout the operational phase, with reference to the SEPA Guidance for Pollution Prevention (GPPs), and best practice guidance.

9.8.2.2 *Dredging*

Chapter 5 details the impact assessment and subsequent mitigation requirements for specific ecological receptors, this assessment is informed by the dredge plume modelling undertaken in this Chapter.

9.8.2.3 *Surface Water Management*

It is proposed that drainage of surface water will adopt SuDS principles and be by means of infiltration through a permeable surface, and the underlying permeable reclamation fill, providing treatment.

Details of the operational surface water management proposals and methodology will be included within the OEMD and will be submitted to SEPA's operations team for agreement consent. Plans of the surface water management system will be located within the Site office, with foul water systems clearly marked.

Where a site use or development proposal is such that it will require a Pollution Prevention and Control (PPC) authorisation from SEPA, then specific processes, techniques and technologies will be included within the surface water management system in that location in order to meet the requirements of the PPC authorisation. Such measures would be in line with best practice guidance.

9.8.2.4 *Oil, Fuel, Site Vehicle Use and Storage*

The proposed development's Pollution Incident Response Plan will be updated for the operational phase of the development, taking full consideration of best practice, statutory requirements and identification of areas of highest sensitivity. It will provide site spill response procedures, emergency contact details and equipment inventories and their location. All operation staff will be made aware of this document, and its contents, and it will be available in the port office. Appropriate spill kits and absorbent materials will be stored in a suitable location which is easy to access. Staff/contractors will be trained in the use of spill kits and other pollution control equipment and the operation of pollution control devices.

9.8.3 Monitoring and Enhancement

The Applicant shall undertake a planned programme of compliance monitoring to verify the effectiveness of the project's environmental management. Monitoring plans will be established and implemented with the agreement of SEPA, NatureScot and Marine Scotland.

Specific auditing and monitoring plans will be developed by the contractor and will cover the following:

- The contractor's own Environmental Management System;
- The CEMD, schedule of mitigation register, relevant legislation and industry good practice;
- All project activity;
- Roles and responsibilities for those undertaking audits and monitoring;
- Frequency of inspection activities (i.e. daily, weekly, monthly);
- Process to deal with corrective actions/non-compliance; and
- Reporting procedures (including non-compliance).

9.9 Cumulative Impact Assessment

A review of potential cumulative impact was undertaken incorporating consideration of the developments detailed in Table 4-9. The terrestrial developments are not considered to have an impact on coastal processes and as such there are no cumulative impacts identified. With respect to the marine and coastal developments there are considered to be no cumulative impacts, given the scale and location of these developments.

9.10 Residual Effects

The residual effects expected to arise following implementation of the mitigation measures detailed above are summarised in Table 9-7. These residual effects reflect receptor sensitivity, the post-mitigation magnitude and detail the resultant effect on each receptor.

The residual effects are considered to be Negligible, Accordingly, no significant effects on the water environment or coastal processes have been identified.

Table 9-7: Residual Effects

Effect	Receptor	Receptor Sensitivity	Source of Impact	Type of Effect	Duration	Probability of Occurrence	Magnitude of Impact Pre-mitigation	Magnitude of Impact Post-mitigation	Residual effect (Post- mitigation)
Construction Phase									
Changes to hydrology	Coastal water in vicinity of site (Largs Channel)	Medium	Terrestrial construction including infilling of dry dock	Negative	Permanent	Likely	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Terrestrial construction including infilling of dry dock	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Terrestrial construction including infilling of dry dock	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Terrestrial construction including infilling of dry dock	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Terrestrial construction including infilling of dry dock	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Terrestrial construction including infilling of dry dock	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
Water and sediment quality – Dredging Works	Coastal water in vicinity of site (Largs Channel)	Medium	Construction including capital dredge	Negative	Short	Likely	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
Water and sediment quality – Dewatering	Coastal water in vicinity of site (Largs Channel)	Medium	Dewatering of infill material	Negative	Short	Likely	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Dewatering of infill material	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Dewatering of infill material	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible

Effect	Receptor	Receptor Sensitivity	Source of Impact	Type of Effect	Duration	Probability of Occurrence	Magnitude of Impact Pre-mitigation	Magnitude of Impact Post-mitigation	Residual effect (Post- mitigation)
	SSSI-Ballochmartin Bay	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
Water and sediment quality – Pollution Incident	Coastal water in vicinity of site (Largs Channel)	Medium	Construction oils, fuels & concrete	Negative	Short	Possible	Low - High	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Construction oils, fuels & concrete	Negative	Short	Unlikely	Low – High	Negligible	Negligible
	SSSI – Southannan Sands	High	Construction oils, fuels & concrete	Negative	Short	Possible	Low - High	Negligible	Negligible
	SSSI-Kames Bay	High	Construction oils, fuels & concrete	Negative	Short	Unlikely	Low – High	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Construction oils, fuels & concrete	Negative	Short	Unlikely	Low – High	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Construction oils, fuels & concrete	Negative	Short	Unlikely	Low – High	Negligible	Negligible
Changes to tidal regime	Coastal water in vicinity of site (Largs Channel)	Medium	Construction including capital dredge	Negative	Permanent	Certain	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
Changes to wave climate	Coastal water in vicinity of site (Largs Channel)	Medium	Construction including capital dredge	Negative	Permanent	Certain	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Construction including capital dredge	Negative	Permanent	Possible	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible

Effect	Receptor	Receptor Sensitivity	Source of Impact	Type of Effect	Duration	Probability of Occurrence	Magnitude of Impact Pre-mitigation	Magnitude of Impact Post-mitigation	Residual effect (Post- mitigation)
	SSSI-Ballochmartin Bay	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
Changes to sediment transport	Coastal water in vicinity of site (Largs Channel)	Medium	Construction including capital dredge	Negative	Permanent	Possible	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Construction including capital dredge	Negative	Permanent	Possible	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Construction including capital dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
Operational Phase									
Water and sediment quality – Dredging Works	Coastal water in vicinity of site (Largs Channel)	Medium	Maintenance Dredge	Negative	Short	Likely	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Maintenance Dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Maintenance Dredge	Negative	Short	Likely	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Maintenance Dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Maintenance Dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Maintenance Dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
Water and sediment quality – Pollution Incident	Coastal water in vicinity of site (Largs Channel)	Medium	Fuel spill from boats	Negative	Short	Possible	Low - High	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Fuel spill from boats	Negative	Short	Unlikely	Low – High	Negligible	Negligible
	SSSI – Southannan Sands	High	Fuel spill from boats	Negative	Short	Possible	Low - High	Negligible	Negligible

Effect	Receptor	Receptor Sensitivity	Source of Impact	Type of Effect	Duration	Probability of Occurrence	Magnitude of Impact Pre-mitigation	Magnitude of Impact Post-mitigation	Residual effect (Post- mitigation)
	SSSI-Kames Bay	High	Fuel spill from boats	Negative	Short	Unlikely	Low – High	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Fuel spill from boats	Negative	Short	Unlikely	Low – High	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Fuel spill from boats	Negative	Short	Unlikely	Low – High	Negligible	Negligible
Changes to tidal regime	Coastal water in vicinity of site (Largs Channel)	Medium	Quayside and maintenance dredge	Negative	Permanent	Certain	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
Changes to wave climate	Coastal water in vicinity of site (Largs Channel)	Medium	Quayside and maintenance dredge	Negative	Permanent	Certain	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Quayside and maintenance dredge	Negative	Permanent	Possible	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI-Ballochmartin Bay	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
Changes to sediment transport	Coastal water in vicinity of site (Largs Channel)	Medium	Quayside and maintenance dredge	Negative	Permanent	Possible	Negligible	Negligible	Negligible
	Wider Firth of Clyde coastal waters	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	SSSI – Southannan Sands	High	Quayside and maintenance dredge	Negative	Permanent	Possible	Negligible	Negligible	Negligible
	SSSI-Kames Bay	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible

Effect	Receptor	Receptor Sensitivity	Source of Impact	Type of Effect	Duration	Probability of Occurrence	Magnitude of Impact Pre-mitigation	Magnitude of Impact Post-mitigation	Residual effect (Post- mitigation)
	SSSI-Ballochmartin Bay	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible
	Hunterston B Cold Water Intake	High	Quayside and maintenance dredge	Negative	Permanent	Unlikely	Negligible	Negligible	Negligible

9.11 Statement of Significance

Overall, the effects of the proposed development on the water environment and coastal processes are not considered to be significant.

10 SOCIOECONOMIC AND HUMAN HEALTH

10.1 Introduction

This chapter provides an assessment of the potential socio-economic and health impacts associated with the Proposed Hunterston Marine Yard (the "Proposed Development"). The planning application for the development is being submitted to North Ayrshire Council by Clydeport Operations Ltd (the Applicant) for development of the existing Hunterston Construction Yard, comprising the formation of a new quay and infilling of the dry dock to form an upgraded marine construction yard. The proposed works will deliver an upgraded construction yard facility that can be used for activities such as servicing offshore renewable wind turbines and associated infrastructure. The exact use is not confirmed at present so the potential use of servicing offshore wind turbines has been considered for the purposes of this chapter as appropriate.

The purpose of the assessment is to examine how the Proposed Development will impact upon local communities and the local & regional economy. In this context community impacts refer to the consequences of the Proposed Development on human populations relating to the ways in which people live, work, play, relate to one another and their health. The economic impacts cover issues in terms of businesses, employment and direct spending that may arise as a consequence of the proposed development. The proposed development comprises works that are both marine-based and terrestrial based (requiring planning permission and marine works licence). This chapter covers activities that are terrestrial because these are defined with consideration of marine impact in terms of inclusion of a stakeholder group.

10.2 Scoping and Consultation

Scoping Response

The Hunterston Construction Yard Development scoping report (issued in October 2023) had scoped out socio-economic issues but the scoping response, particularly from the Marine Analytical Unit (MAU) has requested a Socio-Economic Impact Assessment is scoped into the EIA. The scoping response from MAU has asked for a proportionate assessment of:

- Socio-economic impact assessment; and
- Population & human health.

Noting that the development is relatively small the MAU response notes the detail included in the SEIA should be "proportionate".

In terms of economic impacts, the SEIA should analyse the gross value added ("GVA") and employment impacts of the proposed development, including the direct, indirect and induced impacts and take account of deadweight, leakage, displacement and substitution. The inclusion of sensitivity analysis to account for risk, uncertainty and optimism bias is also welcomed. The assessment of the employment impacts should focus on the years of employment and type of jobs. If it is possible to supply additional information about the types of jobs that are expected to be created (e.g. part-time, full-time, skilled, unskilled, etc) and how these compare to the existing jobs in the study area, this will add further depth to the analysis.

We advise that the assessment of potential socio-economic impacts would benefit from the engagement with local communities (see Methods Toolkit referenced in Annex 1). We would like to see which social and economic impacts are anticipated by local communities. This could be built into any community engagement or consultation activities the developer is planning to use.

Consultation

A Pre-Application Consultation Report has been submitted as part of the application process and describes the following key activities:

- Serving of Proposal of Application Notice (PoAN) to North Ayrshire Council and Fairlie, West Kilbride, Largs and Cumbrae Community Councils. It was also served to key stakeholders including Community Councillors, the MSP and Westminster MP.
- Community Consultation Event 1: 18th October 2023 [24 attendees]
- Community Consultation Event 2: 8th November 2023 [21 attendees] with both events occurring between 15:00 and 19:00 at Fairlie Village Hall and both events were advertised in Local Press prior to the event and feedback cards were used for gaining opinions. This event included a closed session for Local Councillors 14:00 to 15:00. Following the 2nd consultation event a 3rd was undertaken.
- Community Consultation Event 3: 16th January 2024 held at Garrison House, Millport between 13:00 and 17:00 (less time due to ferry timings etc) [5 attendees]
- The applicant also undertook additional stakeholder consultations to inform on the wider Hunterston PARC project via the Hunterston PARC Liaison Group
- Attendance at Hunterston Liaison Group meetings
- Hunterston PARC website www.hunterstonparc.com also included information on the application

The potential impacts that were discussed during the consultation were:

- Potential noise impacts (particularly on residents in Fairlie, Millport and the Isle of Bute)
- Landscape changes causing a visual impact (particularly in relation to the Isle of Bute)
- Potential increase in site traffic during construction, but also potential when operational
- Road improvements to the A78
- Protection of marine wildlife especially in nearby SSSI sites

There were supportive comments made in relation to job creation and investment for the area.

Social media was analysed to investigate whether there were any comments made in relation to the proposed development. None of particular note were identified (some concerns in local press and Facebook were raised on lack of information but this was prior to an application being made).

Policy, Legislation and Guidance

Policy

National Planning Framework 4 (2023) available at: https://www.gov.scot/publications/national-planning-framework-4/ [last accessed 17/04/2024] is the national spatial strategy for Scotland that sets the spatial principles, regional priorities, national developments and national planning policy. Hunterston is given as a strategic asset and the document supports re-use of the port and wider site, engaging in new technologies (page 17). The description of Hunterston Strategic Asset notes:

"*Aligned with the Ayrshire Growth Deal, jointly funded by the Scottish and UK Governments, investment in this location will support a wellbeing economy by opening up opportunities for employment and training for local people. A community wealth building approach has been embedded within the Deal and Regional Economic Strategy within Ayrshire, and would be expected to form a part of future development proposals to ensure the economic benefits are retained locally as far as possible, strengthening local supply chains and supporting businesses and communities across Ayrshire*." (page 117)

Scotland's National Performance Framework (2016) is a wellbeing framework (see: .https://nationalperformance.gov.scot/national-outcomes/explore-national-outcomes) [last accessed 17/04/2024]. It sets out a series of Outcomes that reflect the values and aspirations of the people of Scotland. Each of these

Outcomes is an element in helping reduce inequalities and give equal importance to economic, environmental and social progress. There are 11 National Outcomes including Culture, Health, Education, Fair Work and Business. These are underpinned by 81 indicators that are chosen to help give a perspective on how the country is progressing towards its goals.

A Manufacturing Future for Scotland (2016)[94] is an Action Plan that sets out a course of action that is complementary to the growth strategies by various manufacturing sectors. It sets out a number of initiatives to increase productivity focusing on skills, employee engagement and energy efficiency amongst others and the hope is that it will stimulate innovation and investment in Scottish manufacturing.

Figure 1: A Manufacturing Plan for Scotland Action Plan

Offshore Wind Sector Deal (2019)[95] has been developed as a commitment from the UK government in recognition that offshore wind could be contributing up to 30GW of generating capacity by 2030. The document notes that domestic opportunities from this are significant with the amount of predicted offshore wind potentially accounting for over £40 billion of infrastructure spending.

Ayrshire Regional Economic Strategy is a new ten-year Regional Economic Strategy for Ayrshire that was formally launched in June 2023 (see: https://www.north-ayrshire.gov.uk/council/strategies-plans-and-policies/ayrshire-regional-economic-strategy.aspx) [last accessed 17/04/2024]. It has been developed by an industry-led working group and has six key themes:

- Support for enterprise;
- Fair work;
- Innovation;
- Good health and wellbeing;
- Stronger places and communities; and
- Enhancing natural capital.

The Ayrshire Growth Deal (2020)[96] is an agreement between the Councils of North Ayrshire, South Ayrshire, East Ayrshire and the Scottish and UK Governments designed to help Ayrshire meet its strategic objectives. It is important because of the challenges in the region including weak productivity, declining population, skills shortages and deprivation.

North Ayrshire's Local Development Plan (2019)[97] is the current adopted local plan for North Ayrshire. It sets out the aims to guide development and investment in the area. The policy document notes that:

"*Hunterston is a key employment location within North Ayrshire and offers deep water sea port facilities and infrastructure that make it a national asset. We want the future National Planning Framework to strengthen its commitment to supporting Hunterston as national development as an energy hub and maximising the economic potential of the port's deep water access.*" (page 2)

The document states that generating new employment opportunities in a flexible range of business, commercial and industrial areas to meet market demand in areas including Hunterston will be supported in principle. The document also notes support for the retention of high value jobs in the energy industry at Hunterston (p23). Hunterston is listed as a Strategic Development Area.

North Ayrshire Council Community Wealth Building Strategy 2024-2027[98] the Community Wealth Building is an approach to economic development that aims to retain wealth, jobs and opportunities within local areas and improve economic prosperity. Community wealth building uses five pillars to encourage retaining wealth locally and creation of more economic benefits for the local area:

- Diverse ownership – develop and support a diverse range of economic ownership models including SMEs and community enterprises;
- Fair employment – Encourage fair pay, local recruitment and training opportunities;
- Financial power – Listen to communities to maximise the impact of financial investment;
- Land and assets – Maximise the function and ownership of local physical assets for benefit of community and enterprises;
- Procurement – Buying goods and services locally to create dense local supply chains.

Hunterston PARC Development Framework (2021)[99] has been developed to provide an overview of how the site could potentially develop. It notes the site is proposed to develop on the basis of:

- "Blue Economy" Sustainable use of ocean resources for economic growth improving livelihoods and jobs
- "Green Economy" Natural capital as a critical economic asset and a source of public benefit
- "Blue Green Economy" Offering a more resilient sustainable growth through low impact industries and modern technologies

For more information on the wider context of the proposed development it is a useful resource to see the wider aspirations for the site and its surroundings.

The policy documents reviewed in this section have demonstrated there is a focus of attention on the Hunterston development and interest in its future use. The potential for it to support offshore wind farm infrastructure should be

[94] https://www.gov.scot/binaries/content/documents/govscot/publications/corporate-report/2018/09/a-manufacturing-future-for-scotland-action-plan/documents/a-manufacturing-future-for-scotland/a-manufacturing-future-for-scotland/govscot%3Adocument/A%2Bmanufacturing%2Bfuture%2Bfor%2BScotland.pdf) [94][last accessed 17/04/2024]
[95] https://www.gov.uk/government/publications/offshore-wind-sector-deal/offshore-wind-sector-deal) [last accessed 17/04/2024
[96] https://www.ayrshiregrowthdeal.co.uk/) [last accessed 17/04/2024
[97] https://www.north-ayrshire.gov.uk/Documents/CorporateServices/LegalProtective/LocalDevelopmentPlan/ldp2.pdf)[last accessed 17/04/2024]
[98] https://www.north-ayrshire.gov.uk/Documents/CWB-strategy.pdf) [last accessed 17/04/2024
[99] https://www.hunterstonparc.com/media/uz0aqyu4/pp_hunterston_parc_approved_framework_consult.pdf [last accessed 17/04/2024]

viewed favourably as supporting a growth area for the region. The proposed development will support an increase to North Ayrshire's construction sector (and manufacturing during operation), provide employment and provide indirect support to the wind energy sector. The proposed development will encourage employment in the local area on a site that is currently under used. The job creation may not be directly high value but is a strategic element of the manufacturing and energy industry jobs within the region.

Guidance

As there is currently no established best practice EIA methodology for the assessment of socio-economic and community impacts in the UK, professional judgement has been used when assessing the effects of the Proposed Development.

Two documents have been used to guide the economic assessment:

- "Economic Impact Assessment for Appraisal, Monitoring and Evaluation – A Guidance Overview[100]
  This guidance has been developed by Scottish Enterprise to demonstrate how they assess economic impact of interventions. It focuses on Gross Value Added (GVA) and Employment associated with an intervention
- The Scottish Government Draft Advice on Net Economic Benefit and Planning[101]
  The aim of this advice is to help developers and planning authorities capture in a meaningful way the contribution of development proposals to the economy, while also recognising the potential impacts, and to take account of this in planning decision making.

In terms of the Health Risk Assessment (HRA) guidance from IEMA on scoping and significance have been used *"Effective Scoping of Human Health in Environmental Impact Assessment"* (Nov 2022) and "Determining Significance for Human Health in Environmental Impact Assessment" (Nov 2022)[102].

10.3 Methodology

The assessment for this chapter is undertaken on the construction phase principally (2 years considered appropriate maximum time to consider) the use of the site during operation is not yet confirmed and flexibility remains within the plans to suit future needs for the area. The operational needs therefore have a higher degree of uncertainty associated with them in socio-economic and health terms.

The assessment steps undertaken for this chapter include:

1. **Policy review** – review of relevant policy at the local and regional level;
2. **Identification of stakeholders** – a stakeholder map (Figure 10-1) has been produced based on groups that could be affected by the proposed development, including those that live nearby, those that could potentially hear or see the proposed development and those that have an interest in the proposed development but do not live in close proximity;
3. **Identification of baseline conditions** – the baseline has been obtained from demographic data from various sites listed in the section;
4. **Understanding the potential social and economic impacts** – potential social and economic impacts are identified (given in Table 10-1) and assessed considering the type of development and the following variables:
   - Receptor Sensitivity (see Table 10-2)
   - Magnitude of impact (see Table 10-3)
   - Assessment of both leads to identification of Significance (see Table 11-4)
5. **Mitigation** – a list of ways to reduce or prevent impacts. Mitigation includes avoiding the impact, or minimising, rectifying or reducing the impacts through the design or operation of the proposed development;
6. **Projection of impacts following mitigation** – where applicable the social and economic impacts from the proposed development once mitigation measures are considered.
7. **Identification of residual effects** – where applicable residual effects that remain following the implementation of mitigation measures to address the potential impacts of the proposed development

The Socio-Economic Impact Assessment and Population & Health chapter addresses the potential direct, indirect and wider socio-economic impacts resulting from the Proposed Development. The impacts considered in the assessment take into account the scoping response, specifically by MUA. Table 42 lists the issues that will be considered by the Socio-Economic Impact Assessment and Population & Health assessments (this has been developed based on the professional judgement of Dr Bryony Turner and references provided by MUA in their scoping response).

Table 10-1: Scope To Be Covered In Assessments

Subject	Scope	Description of Assessment
Socio-Economic Impact Assessment	Direct economic	GVA
		Employment, including employment generation and safeguarding of existing employment
		Characteristics of employment (e.g. skill group)
		Labour supply and training
		Other labour market effects, including wage levels and commuting patterns
	Indirect / induced / wider economic / expenditure	Employees' retail expenditure (induced)
		Linked supply chain to main development (indirect)
		Labour market pressures
		Wider multiplier effects
		Effects on commercial activities (tourism and fisheries)
		Effect on development potential of area
	Community resources	Effect on community resources (tourism and other activities outside commercial activities including right to roam)
Population & Human Health	Population characteristics	Changes in population size; temporary and permanent;
		Settlement patterns
		Stakeholder mapping
	Population perception	Public safety
		Perceptions of risk
		Community consultation feedback (concerns raised etc)
	Health risk assessment	Potential for negative impact on the health of receptors
		Potential for negative impact on the mental health of receptors

In addition, references are made to other chapters that cover socio-economic related issues:

- Construction dust risk assessment,
- Seascape, Landscape and Visual Assessment (Chapter 6),

[100] https://www.evaluationsonline.org.uk/evaluations/Documents.do?action=download&id=716] last accessed 17/04/2024
[101] https://www.gov.scot/publications/draft-advice-on-net-economic-benefit-and-planning/] last accessed 17/04/2024
[102] www.iema.net) [last accessed 17/04/2024]

- Terrestrial Noise (Chapter 7) and
- Traffic Assessment (Chapter 8)

Data sources include Scotland's Census Results Online website (http://www.scrol.gov.uk), liaison with North Ayrshire Council, (Marine Analytical Unit) MAU and internet searches. The chapter includes a matrix with potential areas of magnitude, significance and explanatory notes included.

Table 10-2: Socio-Economic and Health Sensitivity Criteria

Sensitivity	Typical Description
High	The receptor has little or no capacity to absorb change without fundamentally altering its character / current success and / or is of national importance from a tourism or socio-economic value with a substantial proportion of national visitors.
Medium	The receptor has moderate capacity to absorb change without fundamentally altering its present character / current success and / or is of regional importance from a tourism or socio-economic value perspective with a substantial proportion of regional visitors
Low	The receptor has high capacity to absorb change without fundamentally altering its present character / current success and / or is of local importance from a tourism or socio-economic value perspective without a proportion of regional visitors
Negligible	The asset/economy is resistant to change and/or is of little tourism, recreational or socio-economic value. For example, an incidental destination with low numbers of current visitors.

Table 10-3: Socio-Economic and Health Magnitude Criteria

Magnitude	Typical Description
High	More than 10% change to baseline conditions likely
Medium	More than 5% change to baseline considered likely
Low	2-5% and above change to baseline conditions considered possible
Negligible	Up to 2% change in baseline conditions considered possible

An example of a magnitude and significance criteria is given in Table 10-4, and this has been developed to reflect the demographics of the area. The population and health impact assessment is presented in the form of an assessment table, Table 10-10.

Table 10-4 Significance Criteria for Socio-Economic Impact Assessment and Population & Human Health Chapters

Sensitivity	Impact Magnitude			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or Minor	Negligible or minor	Minor
Low	Negligible or Minor	Negligible or Minor	Minor or moderate	Minor or moderate
Medium	Negligible or Minor	Minor	Moderate or Major	Moderate or Major
High	Minor	Moderate	Significant	Significant

10.4 Baseline

The application site has a nearby postcode of KA23 9QW. It is within Fairlie and Rural 02 data zone within North Ayrshire. The Health Board Area is Ayrshire and Arran and it is within the Council area of North Ayrshire. The following sites are examples that were used for the baseline information:

- National Records of Scotland: https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/north-ayrshire-council-profile.html#Population_Projections
- Scottish Government Statistics: https://statistics.gov.scot/home
- North Ayrshire Council: https://www.north-ayrshire.gov.uk/home.aspx
- Office for National Statistics: https://www.ons.gov.uk/visualisations/labourmarketlocal/S12000021/
- Nomis Data: https://www.nomisweb.co.uk/reports/lmp/la/1946157425/report.aspx

Current Operations at the Proposed Development Site

EnviroCentre Ltd has been appointed by Arch Henderson on behalf of Clydeport Operations Ltd., to undertake an Environmental Impact Assessment (EIA) in relation to the upgrade of the existing Hunterston Construction Yard (HCY) into a harbour facility with a large working platform suitable for renewable industries. The site is located in North Ayrshire.

The site has historically been used for industry and includes an access road, service infrastructure, deep dry dock (approximately 20m deep) and was constructed in the 1970s by infilling. The site extends out into the Firth of Clyde with Hunterston Power Stations ~1km to the south; Fairlie village ~1.9km to the northeast; the island of Great Cumbrae ~1.4 km to the northwest; and the redundant Hunterston Coal Terminal ~500m to the east.

The proposed development consists of upgrade of the existing Hunterston Construction Yard into harbour facility with a large working platform for renewable industries, south of Fairlie in North Ayrshire.

The site is currently vacant, relatively flat, reclaimed land that is approximately 40 Ha and the marine construction yard has 0 current employees. The site is accessible via Oilrig Road / Power Station Road from the A78 at the Hunterston roundabout. The proposed development includes the following:

- The construction of a new quay and associated quayside infrastructure on the western edge of the site to berth vessels;
- Works could include land reclamation, removal of the existing dock entrance bund, and/or removal of existing land to facilitate the construction of appropriate berths;
- Demolition works of existing structures including removal of the base of the former dry dock;
- Infilling of the former dry dock basin to provide additional land for general industrial purposes;
- Ground improvement works including piling;
- Dredging (including future maintenance) to enable marine vessel access to quay areas;
- Provision of site utilities and any required foundations within storage areas; and
- Erection of temporary site offices and staff welfare buildings to accommodate site workforce.

Population

The information in the following paragraph is taken from https://statistics.gov.scot/home with some calculations undertaken by the author on the data provided (percentages).

In 2021 North Ayrshire population was 134,220 persons, this is approximately 2.4% of the population of Scotland. The area of Fairlie and Rural 02 had a population of 621 persons in 2021, approximately 0.5% of the population of North Ayrshire. The land area in 2014 for Fairlie and Rural 02 was 3,829.93 hectares that is approximately 4% of the land area in North Ayrshire (North Ayrshire is approximately 1% of the land area of Scotland). The population in Fairlie and Rural 02 is therefore fairly sparse with an average population density of 0.16 persons per hectare (the Scottish average is approximately 0.7 persons per hectare).

Boundary data: Copyright Scottish Government, contains Ordnance Survey data © Crown copyright and database right (2018)

Within North Ayrshire in terms of overall size, the 45 to 64 age group was the largest in 2021 with a population of 39,018 (the 16 to 24 age group was the smallest with a population of 13,093). Between 2018 and 2028 the population of North Ayrshire is projected to decrease from 135,280 to 131,057 persons. This is a decrease of 3.1% that compares to a projected increase of 1.8% for Scotland. This change is largely due to natural change (more deaths than births) as opposed to migration rates. This information is taken from the National Records of Scotland[103].

The information suggests a population that is ageing so encouraging working age population to the area should assist the changing population demographics. However, it is important to also identify the skills of the current population to ensure migration from or to the area is advantageous.

Employment and Skills

Information on employment has been obtained from:

https://www.ons.gov.uk/visualisations/labourmarketlocal/S12000021/

North Ayrshire's employment rate was lower than across Scotland as a whole in the year ending September 2023. Across Scotland in the year ending September 2023, 75.2% of people aged 16 to 64 years were employed. This was higher compared with the previous year, when 74.5% of people were employed.

Of people aged 16 to 64 years living in North Ayrshire, 68.7% were employed in the year ending September 2023. This is a decrease compared with the year ending September 2022 when the local rate was 71.2%.

Around 2,200 people aged 16 and over in North Ayrshire were unemployed in the year ending September 2023. This is a rate of 3.8%. This was a slight increase compared with the year ending September 2022 when the unemployment rate was 3.6%.

Employment by occupation in North Ayrshire is obtained from:

https://www.nomisweb.co.uk/reports/lmp/la/1946157425/report.aspx (Nomis data) and given in Table 10-5.

Table 10-5 Employment by Occupation (Jan 2023 – Dec 2023)

	North Ayrshire (Numbers)	North Ayrshire (%)	Scotland (%)	Great Britain (%)
Soc 2020 Major Group 1-3	27,500	47.2	51.3	52.9
1 Managers, Directors And Senior Officials	4,400	7.5	7.7	10.8
2 Professional Occupations	16,200	27.8	27	26.9
3 Associate Professional Occupations	6,900	11.9	16.5	15.2
Soc 2020 Major Group 4-5	12,600	21.7	18.7	18.3
4 Administrative & Secretarial Occupations	5,500	9.5	9.2	9.5
5 Skilled Trades Occupations	7,100	12.2	9.4	8.7
Soc 2020 Major Group 6-7	8,000	13.8	15.4	14.2
6 Caring, Leisure And Other Service Occupations	#	#	8.5	8
7 Sales And Customer Service Occs	4,200	7.1	6.8	6.2
Soc 2020 Major Group 8-9	10,100	17.4	14.6	14.6
8 Process Plant & Machine Operatives	4,700	8.1	4.8	5.4
9 Elementary Occupations	5,400	9.2	9.7	9.2

Source: ONS annual population survey
 # Sample size too small for reliable estimate (see definitions)
Notes: Numbers and % are for those of 16+
% is a proportion of all persons in employment

Employment data shows that North Ayrshire has a higher than Scotland average persons in the "Professional Occupations" category, "Skilled Trades Occupations" and "Process plant and machine operatives" these are of relevance to the proposed development (and potential future use) of the site showing the development suits employment within the region.

Qualifications in North Ayrshire is obtained from:

https://www.nomisweb.co.uk/reports/lmp/la/1946157425/report.aspx (Nomis data) and shown in Table 10-6.

Table 10-6 Qualifications (Jan 2023 – Dec 2023)

	North Ayrshire (Level)	North Ayrshire (%)	Scotland (%)	Great Britain (%)
RQF4 And Above (HND, Degree and Higher Degree Level qualifications or equivalent)	41,800	54.3	55.1	47.3
RQF3 And Above (e.g. 2 or more A levels, advanced GNVQ, NVQ 3, 2 or more higher or advanced higher national qualifications (Scotland) or equivalent.	53,700	69.7	73.7	67.8
RQF2 And Above (e.g. 5 or more GCSEs at grades A-C, intermediate GNVQ, NVQ 2, intermediate 2 national qualification (Scotland) or equivalent.	65,900	85.6	87.1	86.5
RQF1 And Above e.g. fewer than 5 GCSEs at grades A-C, foundation GNVQ, NVQ 1, intermediate 1 national qualification (Scotland) or equivalent.	66,800	86.7	87.9	89.0
Other Qualifications includes foreign qualifications and some professional qualifications.	#	#	3.9	4.6
No Qualifications No formal qualifications held.	7,400	9.6	8.2	6.5

Source: ONS annual population survey
Notes: For an explanation of the qualification levels see the definitions section.
Numbers and % are for those of aged 16-64
% is a proportion of resident population of area aged 16-64

All the qualification levels in North Ayrshire are slightly lower than the Scotland average and the number with no qualifications is higher than the Scotland average. This would suggest training and skills development would be useful within the local area.

The type of jobs held by persons within North Ayrshire is taken from

https://www.nomisweb.co.uk/reports/lmp/la/1946157425/report.aspx (Nomis data) and shown in Table 10-7.

[103] https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/north-ayrshire-council-profile.html [last accessed 17/04/2024]

Table 10-7 Employee Jobs 2022

	North Ayrshire (Employee Jobs)	North Ayrshire (%)	Scotland (%)	Great Britain (%)
Total Employee Jobs	41,000	-	-	-
Full-Time	27,000	65.9	67.3	68.8
Part-Time	14,000	34.1	32.7	31.2
Employee Jobs By Industry				
B : Mining And Quarrying	150	0.4	1	0.2
C : Manufacturing	4,500	11	6.9	7.6
D : Electricity, Gas, Steam And Air Conditioning Supply	400	1	0.8	0.4
E : Water Supply; Sewerage, Waste Management And Remediation Activities	600	1.5	0.7	0.7
F : Construction	3,000	7.3	5.7	4.9
G : Wholesale And Retail Trade; Repair Of Motor Vehicles And Motorcycles	7,000	17.1	12.9	14
H : Transportation And Storage	1,250	3	4.1	5
I : Accommodation And Food Service Activities	4,000	9.8	8.4	8
J : Information And Communication	350	0.9	3.2	4.6
K : Financial And Insurance Activities	400	1	3.3	3.3
L : Real Estate Activities	600	1.5	1.3	1.9
M : Professional, Scientific And Technical Activities	1,750	4.3	7.4	9.1
N : Administrative And Support Service Activities	3,000	7.3	8.1	9
O : Public Administration And Defence; Compulsory Social Security	2,500	6.1	6.5	4.7
P : Education	3,500	8.5	8.8	8.6
Q : Human Health And Social Work Activities	6,000	14.6	15.7	13.5
R : Arts, Entertainment And Recreation	1,500	3.7	3	2.4
S : Other Service Activities	600	1.5	1.6	2

Source: ONS Business Register and Employment Survey : open access
- Data unavailable
Notes: % is a proportion of total employee jobs excluding farm-based agriculture
Employee jobs excludes self-employed, government-supported trainees and HM Forces
Data excludes farm-based agriculture

The number employed in construction (7.9%) is higher than the Scotland average (5.7%) that would suggest a good level of potential of construction employees in the region.

Gross Value Added (GVA)

Gross Value Added (GVA) is a measure of the value produced by goods and services and is used to measure the overall economic well-being of an area. GVA is a workplace-based measure, which means that cities tend to have higher GVA per head because economic growth is supported by workers commuting to their area. It is also supported by the concentration of business and public sector activity.

North Ayrshire has an "*Economic Recovery and Renewal Approach*" available at: https://www.north-ayrshire.gov.uk/Documents/EconomyCommunities/economic-recovery-renewal-approach.pdf [last accessed 17/04/2024] the document notes that "*North Ayrshire…consistently have some of the highest rates of poverty, inequality and unemployment, and one of the lowest job densities in Scotland*." (page 5)

The document also notes that Manufacturing is by far North Ayrshire's most important industry in economic output terms at 22% GVA (Gross Value Added).

The *North Ayrshire Economic Review* (2018) available at: https://northayrshire.community/wp-content/uploads/2019/01/North-Ayrshire-Report-final-11-Dec-2018.pdf provides an independent analysis of North Ayrshire and the wider Ayrshire economy.

Chart 1: GVA per Head, Scotland and the Ayrshires 1998-2016, current prices (taken from: https://northayrshire.community/wp-content/uploads/2019/01/North-Ayrshire-Report-final-11-Dec-2018.pdf)

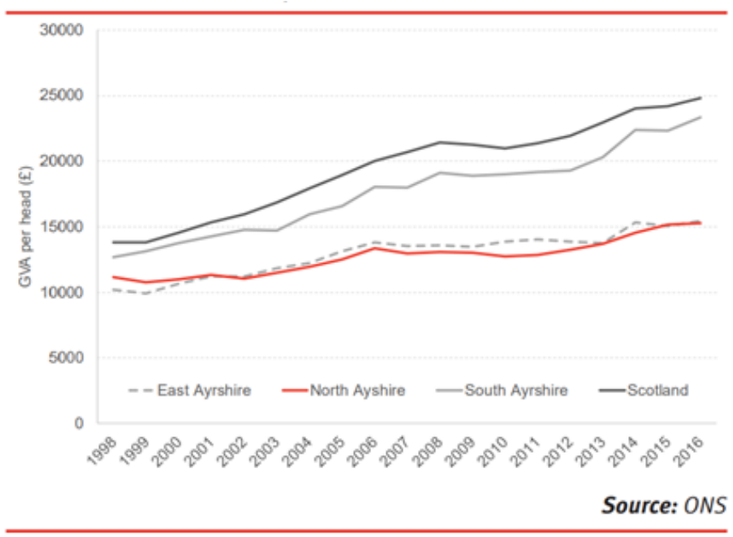


Chart 1 demonstrates that the GVA of North Ayrshire (and East Ayrshire) has been consistently below the Scottish average and the gap is widening over time (to 2016). The number of persons in North Ayrshire in 2016 was 135,890 if we take the GVA per head for 2016 as £15000 this results in approximately £2 billion GVA in 2016 in North Ayrshire (calculated by author).

Note: the population numbers have declined between 2016 and 2024

Community Resources (Including Tourism)

Residents

There are a total of 674 properties within Fairlie with a population estimate of 1,490 in 2021 (see: https://citypopulation.de/en/uk/scotland/north_ayrshire/S19002171__fairlie/) it is described as a commuter town with a prevalence of higher income and private housing. A large proportion of the population are over 45 and many are retired (https://usppreview.blob.core.windows.net/pdfs/Fairlie.pdf) There is a high proportion of people in professional employment with many residents owning two or more cars.

There are properties on the A78 including Fencefoot Farm Cottage and Poteathbank Cottage.

Community Resources

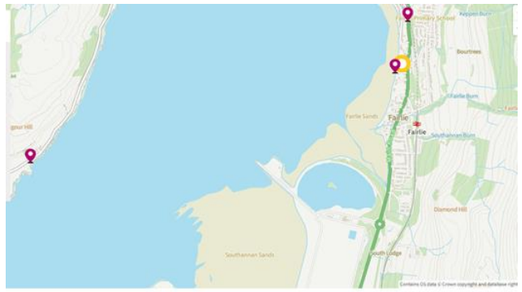
The postcode in proximity to the proposed development site is within the catchment areas for (taken from: https://www.north-ayrshire.gov.uk/education-and-learning/admissions-and-enrolment/primary-school-enrolment.aspx) :

- Fairlie Primary School
- St Mary's Primary School
- Largs Campus (Secondary)
- St Matthews Academy (High School)
-

The community council area is Fairlie. The closest library is in Fairlie and within 5km there are leisure facilities at KA Campus – West Kilbride (more information available at: https://kaleisure.com/location/ka-campus-west-kilbride/). There is a train station at Fairlie.

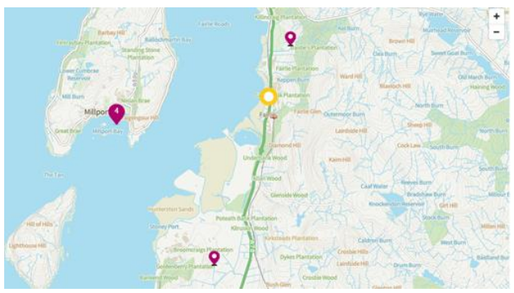
Tourism

Within Fairlie there are accommodation providers these are marked on the map given to give the context to the proposed development site:



- Ferry Row Bed and Breakfast (see: https://ferryrow.co.uk/)
- Beach Bothy Self Catering
- Real Family Holidays (Activity Accommodation) (see: https://www.field-studies-council.org/locations/millport/)

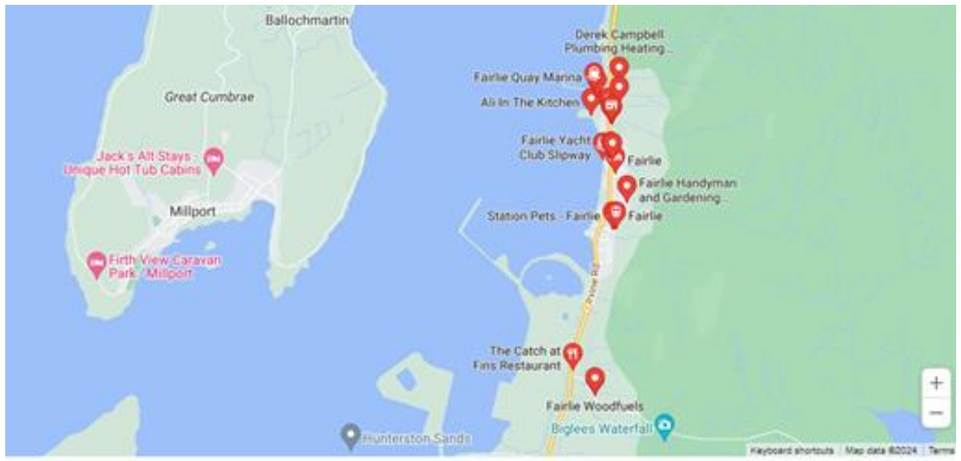
Tourist attractions are taken from: https://www.visitscotland.com/info/towns-villages/fairlie-p242581 [last accessed 17/04/2024] and within the vicinity include:



- Kelburn Castle and Estate is located north of Fairlie (pin included in map) (see: https://www.kelburnestate.com/) there is also a festival that occurs in the Summer at this location
- Hunterston Castle (south of Fairlie) (see: https://www.clanhunterscotland.com/hunterston-castle-2/)
- The locations in Millport are beaches that are unlikely to have a viewpoint to the proposed development site. Chapter 6 incorporates assessment of a viewpoint from the south of Millport.

Local Businesses

There are local organic food producers, farm shops and markets within Fairlie and within Fencefoot (Fencebay Farmers Markets). There is an oyster farm listed near the slipway on the Hunterston Terminal Pier, this is Cumbrae Oyster Farm (see: https://cumbraeoysters.com/#top). Other businesses within Fairlie are small businesses such as Handyman services and restaurants (The Catch at Fins), wood fuel producers and marinas / boating related businesses.



Local Access

A footway is provided on the northern side Power Station Road between Hunterston Roundabout and Oilrig Road, part of which forms part of the Ayrshire Coastal Path. The footway continues on Power Station Road to Hunterston, connected by an informal pedestrian crossing located on Oilrig Road.

A local cycle route is provided between the residential settlement of Fairlie and Power Station Road. This route comprises a shared use path on the western side of the A78 Irvine Road between Fairlie and Southannan Roundabout, and a shared use path segregated from the road that runs between Southannan Roundabout and Hunterston Roundabout. This route forms part of the Ayrshire Coastal Path (see: https://ayrshirecoastalpath.org/). Using this route, Power Station Road is accessible within a 10-minute cycle of Fairlie.

There are national trails and walking routes along with cycle routes in proximity to the Site but not on the proposed development site.

Health Profile of North Ayrshire Population

The North Ayrshire Health and Social Care Partnership Strategic Plan 2022-2030 (see: http://north-ayrshire.cmis.uk.com/north-ayrshire/Document.ashx?czJKcaeAi5tUFL1DTL2UE4zNRBcoShgo=6aubldZ2gbJc6ktLVof7qUk61iSR61Vqd5gi153eJ8M3gXeLSkQlUg%3D%3D&rUzwRPf%2BZ3zd4E7Ikn8Lyw%3D%3D=pwRE6AGJFLDNlh225F5QMaQWCtPHwdhUfCZ%2FLUQzgA2uL5jNRG4jdQ%3D%3D&mCTIbCubSFfXsDGW9IXnlg%3D%3D=hFflUdN3100%3D&kCx1AnS9%2FpWZQ40DXFvdEw%3D%3D=hFflUdN3100%3D&uJovDxwdjMPoYv%2BAJvYtyA%3D%3D=ctNJFf55vVA%3D&FgPllEJYlotS%2BYGoBi5olA%3D%3D=NHdURQburHA%3D&d9Qjj0ag1Pd993jsyOJqFvmyB7X0CSQK=ctNJFf55

vVA%3D&WGewmoAfeNR9xqBux0r1Q8Za60lavYmz=ctNJFf55vVA%3D&WGewmoAfeNQ16B2MHuCpMRKZMwaG1PaO=ctNJFf55vVA%3D) [last accessed 17/04/2024]

To help inform the plan the Partnership undertook consultation that received 726 respondents from North Ayrshire where people were asked "*What do you do to keep yourself well?"* The largest number of responses by people were "Go for a walk" "Spend time with friends and family" or "Get enough sleep". The wellbeing conversation revealed that people keep healthy and well largely through activities at home, the community and by enjoying the local environment.

The North Ayrshire Health and Wellbeing Profile (see: https://www.scotpho.org.uk/media/1045/scotpho-hwb-profiles-aug2016-northayrshire.pdf) [last accessed 17/04/2024] states there is a similar life expectancy in the area compared to Scotland as a whole. The rate for cancer registration in 2011–2013 was, at 646, similar to Scotland's overall rate of 634. The rate for patients hospitalised with asthma in 2011–2013, 130, was higher than the Scottish rate of 91. The rate for emergency hospitalisations in 2011–2013, at 9260, was higher than the rate for Scotland (7500). The rate for patients hospitalised for chronic obstructive pulmonary disease (COPD) in 2011–2013, at 932, was higher than the Scottish rate of 660. In 2011–2013, coronary heart disease rate was, at 459, similar to the Scottish level of 440. For road traffic accidents in 2011–2013 the rate was, at 65, similar to the Scottish rate of 63. The rate for adults aged 65 years and over with multiple hospital admissions in 2011–2013, at 5703, was higher than that in Scotland (5160). The percentage of people prescribed medication for anxiety, depression or psychosis in 2014/15 was at 19% that is higher than Scotland overall (17%).

10.5 Impact Assessment

Inter-Linkages to Other Chapters

Other chapters cover socio-economic related issues and so significant findings that could affect the socio-economic assessment are identified. The following summarises the main reports of note:

- Construction dust risk assessment,
- Seascape, Landscape and Visual Assessment (Chapter 6),
- Terrestrial Noise (Chapter 7) and
- Traffic Assessment (Chapter 8)

Construction Dust Risk Assessment

EnviroCentre has undertaken a Construction Dust Assessment for the proposed development. Emissions of dust to air can occur on construction sites through demolition of existing structures, land clearance, earthworks, vehicle movements and these can cause annoyance and lead to the potential for human health effects. Sensitivity criteria for health effects are listed including exposure considerations over time periods for air quality objectives (annual mean PM_{10} concentration). Sensitive receptors have been identified and include residential and commercial types. The residential receptors are identified as having high sensitivity whilst commercial are medium sensitivity for dust soiling and PM_{10} effects.

The risk of impacts for dust soiling and the health effects of PM10 were assessed at six human sensitive receptors in the vicinity of the site. The assessment results in the determination of a Low risk of dust soiling impacts and a Low risk of health impacts for Demolition, Earthworks, Construction and Trackout activities. Mitigation measures are listed in Appendix B that would fit within a Construction Management Plan for the site and a specific Construction Dust Management Plan has been prepared.

It is therefore concluded that are no negative residual impacts in terms of socio-economic and human health associated with the construction dust risk assessment.

Seascape, Landscape and Visual Assessment

Seascape, Landscape and Visual Impact Assessment (SLVIA) has been completed for the proposed development. The viewpoints included a number of potential socio-economic receptors including a viewpoint from Fairlie and the coastal path. The assessment considers impacts during the construction phase only and there are a total of nine viewpoint locations and include Hunterston Castle. The results of the SLVIA have assessed that the proposed development would result in significant seascape, landscape and visual effects during the construction phase and it is identified as being on a very localised scale and is not considered to reach unacceptable levels, particularly when taken into account with cumulative changes in the area with other planned and proposed developments.

Therefore, no significant effect from a socio-economic or health perspective has been identified associated with the SLVIA for the proposed development.

Noise

A construction noise assessment has been completed for Hunterston Construction Yard. The worst case combined construction stages based on the proposed construction schedule were modelled. The proposed works are considered to comprise two key phases of initial works to provide access and prepare the site for construction followed by a primary construction phase. There is the potential that dredging (during construction period) may be carried out over a 24 hour period and so this was considered in the assessment.

The outcome of the assessment is neutral impacts are predicted at all assessed Noise Sensitive Receptors (NSRs) during the day. A moderate adverse impact is predicted during night-time hours at Marine Parade, Isle of Great Cumbrae due to backhoe dredging in proximity. The moderate noise impact is identified as not likely to be key in decision making issues.

This has a potential socio-economic receptor present in terms of "Real Family Holidays" that is located in Millport. In socio-economic considerations the charity-based Millport Field Studies Centre has indoor accommodation provision (for a total of 154 guests on site, please note they do not encourage camping on site) but it would be advisable to avoid peak season for their activity weeks for dredging works at night (their peak season is June to August).

Traffic Assessment

As shown by the stakeholder mapping there is a risk that traffic changes in an area can have an effect on socio-economic receptors. The following roads have been considered in the assessment, A78 Irvine road, Oilrig road and Power Station road with automatic traffic counts undertaken to identify the annual average daily traffic (AADT).

In accordance with the prevailing guidance, the traffic related impacts including; traffic impact, severance, driver delay, non-motorised user delay and amenity, fear and intimidation, road safety, and hazardous/large loads associated with the construction phase of the development have been assessed.

The traffic assessment concludes no significant residual impact that would affect potential socio-economic concerns.

Direct Economic

This section is considering the direct economic effects of the proposed development. This is in terms of GVA, employment, the characteristics of the employment and the labour supply.

The baseline assessment noted that employment should be encourage in the North Ayrshire region and there are personnel with construction experience (7.3%) compared to the Scotland average of 5.7%.

As stated previously the marine construction yard currently have 0 employees. In terms of the construction works the allowance is for 75 staff (each 2 year construction period). In operation it is proposed to be used as an ongoing

port facility, ultimately the site may then be used for offshore renewables enabling works. However, this future use is not yet confirmed and flexibility remains within the plans to suit future needs for the area. The baseline data has revealed the skills levels and availability of suitably qualified personnel in the area is likely to mean the majority of staff can be obtained from the North Ayrshire region. Some specialist skills may be needed from the wider area of Scotland.

There is a £150 million capital spend associated with the construction works. It is not expected that the equipment requirement will be specialist and therefore it is expected that 80% will come from Scotland and the UK (20% from overseas (based on professional judgement). Contractors in North Ayrshire will be able to provide more general site services in support of the construction element. In general the spend in North Ayrshire is expected to be £6 million (4% of the total) and £114 million within Scotland (76% of the total).

Indirect / Induced / Wider Economic Expenditure

Economic activity, such as construction, will generate what is referred to as economic multiplier effects. The construction industry will be encouraged however the activity will also lead to purchase of materials and employment of others to provide services therefore generating an indirect economic effect in the supply chain. In addition, the construction company and all companies in its supply chain pay their workers' wages that they will spend in the supermarkets, restaurants etc. This is the induced effect.

These three types of effect are what are considered when addressing the impact of spending. This leads to output and GVA in the economy. In 2017 the multipliers for construction were as given in Table 10-8. These are calculated with the potential contribution of the project on the basis that there will be £3 million in the North Ayrshire economy each year (total £6 million).

Table 10-8 Direct, Indirect and Induced Multipliers for Construction in Scotland (2017) (Source: Scottish Government 2017 Input-Output Tables; FAI calculations*)*

	GVA – Output Multipliers				Employment-Output Multipliers			
	Direct	**Indirect**	**Induced**	**Total**	**Direct**	**Indirect**	**Induced**	**Total**
Construction	0.43	0.25	0.30	0.97	8.69	4.76	4.48	17.93
Proposed development	£1.29m	£0.75m	£0.9m	£2.91m	26 FTE	14 FTE	13 FTE	54 FTE

There may be some differences due to rounding errors but this is a good indication of the direct, indirect and induced effect from an introduction of the projected spend into the North Ayrshire economy (this spend may not be limited to North Ayrshire and when looking throughout Scotland the effect will be substantially greater).

Community Resources

The baseline has demonstrated a good level of community resources available in the area based on the population demographics. Other chapters have not identified any residual significant negative effects that could affect socio-economic receptors such as tourism accommodation, commercial activities or effects on access routes near to the site (the only risk is to Millport Field Studies Council from a noise perspective during construction from dredging activities but this is not considered to be significant).

Population Characteristics

A local contractor(s) is likely to be used for the majority of the engineering works and is unlikely to result in a change to the population size on a permanent basis because the construction is likely to last a maximum of 2 years. There is therefore unlikely to be a change to the settlement patterns with employees from North Ayrshire being encouraged.

It is noted that there has been a declining population in North Ayrshire from recent years (comparison to 2016) and so a way to promote employment in the area is likely to have a positive effect. During baseline data gathering it became apparent there are a variety of excellent apprenticeship schemes in the area, for example: https://www.skillsdevelopmentscotland.co.uk/local-national-work/north-ayrshire Skills Development - Ayrshire. Use of apprenticeship schemes would be encouraged for the employees and contractors on site to ensure skills development within the North Ayrshire region.

Stakeholder Mapping

A number of stakeholders have been identified as shown in Figure 10-1. Based on the author's professional knowledge the principal concerns for these groups of individuals are also indicated. The stakeholders are demonstrated in terms of their interest related to the EIA and influence on the proposed development this helps to understand the sensitivity of the stakeholder groups when assessing the socio-economic impacts. These stakeholder groups are also included in the main assessment table (see next section).

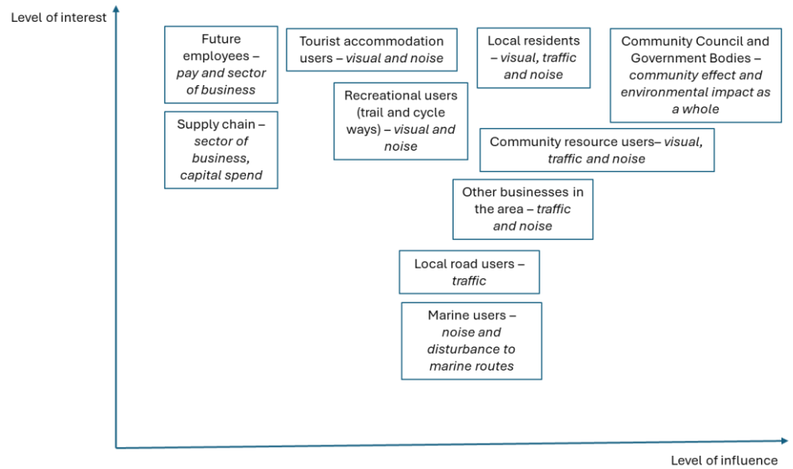


Figure 10-1 Stakeholder Mapping at the Proposed Development

Population Perception

The potential impacts that were discussed during the public consultation process were:

- Potential noise impacts (particularly on residents in Fairlie, Millport and the Isle of Bute)
- Landscape changes causing a visual impact (particularly in relation to the Isle of Bute)
- Potential increase in site traffic during construction, but also potential when operational
- Road improvements to the A78
- Protection of marine wildlife especially in nearby SSSI sites

There were supportive comments made in relation to job creation and investment for the area.

Social media was analysed to investigate whether there were any comments made in relation to the proposed development. None of particular note were identified (some concerns in local press and Facebook were raised on lack of information but this was prior to an application being made). These issues have all been explored in this chapter with checks made on appropriate EIA chapters that have been completed. No residual negative effect were identified.

A check on UK crime statistics (see: https://www.crime-statistics.co.uk/Postcode) revealed no recent incidences in the area. This would suggest that public safety in the area is good and will be supported with good site management during the construction period.

Health Risk Assessment (HRA)

Almost every development that requires planning permission has a potential effect on human health. Some links are obvious, for example increased road traffic and emissions to air from dust. Others are less obvious, such as the impact a project may have on public open spaces and the ability of the local community to exercise with its associated health benefits, and increasing traffic along residential streets that could lead to a lack of neighbourly contact, social isolation and poorer physical and mental health.

Guidance from IEMA on scoping and significance have been used for the HRA *"Effective Scoping of Human Health in Environmental Impact Assessment"* (Nov 2022) and "Determining Significance for Human Health in Environmental Impact Assessment" (Nov 2022) (available from www.iema.net) [last accessed 17/04/2024]

This Health Risk Assessment (HRA) has been designed to be proportionate to the application and aims to:

- Check and clarify information and statements made with regard to health in the documentation submitted with the planning application;
- Identify and highlight direct and indirect health issues if applicable of the proposed development; and
- Recommend actions to mitigate against possible negative health impacts and maximise positive health benefits where applicable.

Based on HRA of similar developments the following issues are considered:

- Healthy Lifestyles – How the proposed development will affect physical activity, including access to open space;
- Crime and community safety – Will the proposed development result in an effect on community safety;
- Air quality and neighbourhood amenity – Will air quality or noise effects cause an impact on stakeholders;
- Social cohesion and social capital – Will the development disrupt the local community social networks

For each impact identified within this HRA the impact has been examined against the following:

- The potential nature of the impact (negative, neutral or positive);
- The degree of certainty (unlikely, probable or definite);
- The duration (short term or long term) and which phase of the proposed development (construction and/or operation);
- The pathways by which impacts occur (this is the route by which changes to determinants of health lead to changes in health outcomes)
- Which stakeholders would be affected;
- Level of significance (None, Significant or Key significant)

Healthy Lifestyles

From the baseline assessment undertaken and information presented regarding health it is apparent that outside space for recreational purposes is important to the local community. The fact that there are cycle ways and paths within vicinity of the proposed development are an important consideration and any disruption to the use of those routes should be avoided.

Crime and community safety

The lack of crime in the area is due to no activity on the site this suggests that having good site management in place will continue to support this. The low crime rates should be maintained during construction and when the site is in operation but have been set as a probable effect because the change in use is an important consideration for this issue but the impact is not considered to be significant.

Air quality and neighbourhood amenity

The risk of impacts for dust soiling and the health effects of PM10 were assessed at six human sensitive receptors in the vicinity of the site as part of the Construction Dust Risk Assessment (CDRA). The assessment results in the determination of a Low risk of dust soiling impacts and a Low risk of health impacts for Demolition, Earthworks, Construction and Trackout activities.

The SLVIA has assessed significant effect on seascape, landscape and visual effects but to a very localised area and the change is in keeping with other cumulative effects assessed. Therefore, there is no significant effect expected from a health perspective.

The noise chapter was considered and identified a potential issue during dredging at night that may affect tourism accommodation at Millport Field Studies Centre. The site does not encourage camping and has indoor accommodation and so a health effect in terms of audible disturbance is not expected but advice in the socio-economic chapter has included avoiding their peak season for this activity (June to August) and contact with the charity-based organisation should be maintained to check disturbance has not become an issue. No significant effect is expected from a health perspective on this issue.

The traffic assessment has included consideration of key aspects such as fear and intimidation with increased traffic levels and road safety and all impacts have been assessed as insignificant.

Social cohesion and social capital

Social capital is defined as the resources accessed by individuals as a result of their membership of a network or a group. It has been linked to population health outcomes among individuals as well as collective entities (such as neighbourhoods, workplaces). Indicators of social capital include the exchange of social support and information within a social network as well as the levels of trust that lubricate such exchanges. Social capital has the dual potential to promote health as well as to threaten health, for example, via the exclusion of outsiders.

The employee levels and type of proposed development would not suggest a change in population characteristics, the baseline data has presented there are suitable workers within the vicinity.

Table 10-9 provides a summary of the HRA.

Table 10-9 Health Risk Assessment

	Healthy lifestyles	**Crime and community safety**	**Air quality and neighbourhood amenity**	**Social cohesion and social capital**
Potential nature of the impact	Neutral	Neutral	Neutral	Neutral
Degree of certainty	Unlikely	Probable	Unlikely	Unlikely
Duration	Short term	Short term (may be long-term depending on future use)	Short term	Short term
Phase of Proposed Development	Construction (no effect during operation)	Construction and operation	Construction	Construction (may be long-term

				depending on future use)
Pathways	Dust, noise	Visible equipment	Dust during construction	Incoming residents
Stakeholder group	Local residents, tourists	Local residents	Local residents	Local residents
Significance	None	None	None	None

The HRA concludes that there are no likely significant effects on the physical health or mental health from the proposed development.

Assessment Table

The assessment of socio-economic and population & human health has been summarised in Table 10-10.

Table 10-10 Assessment of Socio-Economic Impact Assessment and Population & Health

Subject	Scope	Receptor	Sensitivity of Receptor	Short / Long term	Magnitude of impact	Potential Positive or negative	Effect
Socio-economic Impact Assessment	Direct economic	Future employees	Negligible	Short term during construction but potential for long-term based on future use on site	Low	Positive – job creation in the area as none on site at present	Minor
	Indirect / induced / wider economic expenditure	Supply chain, Other businesses in the area	Negligible	Short term during construction but potential for long-term based on future use on site	Low	Positive – supply chain economic expenditure in supported manufacturing sector	Negligible
	Community resources	Recreational users, Tourist accommodation, Local residents, Marine users	Low	Long term potential	Low	Positive – the population has been decreasing so any in-migration would be positive	Negligible
			Low	Short term noise during construction	Medium	Negative – potential for noise impact from dredging on tourism on Millport	Minor
Population &	Population characteristics	Local residents, local road users	Low	Short term during constructio	Low	Negative – a number of studies have	Negligible
				n but potential for long-term based on future use on site		been undertaken but none have identified the potential for effect on socio-economic receptors	
	Population perception	Local residents, future employees	Low	Short term	Low	Negative – a change in use can always have potential for perception to change	Negligible
	Health risk assessment	Local residents, Community Council etc	Negligible	Short term during construction but potential for long-term based on future use on site	Low	Negative – introduction of use on site has the potential to affect people physically and mentally	Negligible

There are no negative significant effects from the proposed development in terms of socio-economic and population & health.

10.6 Cumulative Impact Assessment

The largest consideration for cumulative impacts in the area in terms of socio-economic effect is Hunterston B Power Station that is a nuclear power station located 6 miles south of Largs that began operation in 1976. The plant began decommissioning in January 2022. As of 2021 Hunterston B employed 448 permanent staff (99% classified as full-time) with over half having 10+ years experience on the site.

There were approximately 140 permanent contractors also on site. The scoping report for the decommissioning (available at: https://www.edfenergy.com/media/20165/download) [last accessed 17/04/2024] details that in 2026 the total number of FTE jobs on the site will reduce with net direct jobs reducing by 60 FTE by 2024. The type of skills are likely to be supported by the construction and potentially future use of the proposed development.

In terms of the traffic assessment the cumulative aspects are included in the main assessment (included within the numbers analysed) and no significant effects were identified.

No cumulative effects linked to socio-economic or health are likely associated with the proposed development

10.7 Mitigation and Monitoring

No significant effects associated with Socio-Economic Impact Assessment and Population & Human Health. However, there are some suggestions made as a result of baseline investigations and noted within the application documents.

1. Minimise dredging at night near the Millport Field Studies Centre (particularly during their peak season June to August)
2. Maintain a management plan (construction management plan and during operation) that minimises any risk of crime on the site and ensures cycle ways and footpaths nearby are not interrupted.
3. A number of apprenticeship schemes were identified such as Skills Development – Ayrshire: https://www.skillsdevelopmentscotland.co.uk/local-national-work/north-ayrshire the use of these resources to encourage local apprenticeships through direct and suppliers should be encouraged.
4. It is noted that West Kilbride Community Council are keen for companies operating in the area to sign up to the Considerate Constructors Scheme (information leaflet included below).

Code of Considerate Practice

CONSIDERATE CONSTRUCTORS SCHEME

Organisations registered with the Considerate Constructors Scheme make a commitment to conform to the Code of Considerate Practice. Through consideration to community engagement, the environment and workforce wellbeing they strive to improve the impact of the construction industry and leave a positive legacy through the implementation of best practice. The Code of Considerate Practice defines the fundamental expectations for registration with the Scheme. The Code applies equally to all organisations registered with the Scheme, regardless of size, type or location.

RESPECT THE COMMUNITY

Constructors must manage their impact on their neighbours and the public to support a positive experience, by:

Ensuring courteous and respectful language and appropriate behaviour in and around the construction activity.

Providing a safer environment, preventing unnecessary disturbance, and reducing nuisance for the community from their activities.

Proactively maintaining effective engagement with the community to deliver meaningful positive impacts.

CARE FOR THE ENVIRONMENT

Constructors must minimise their impact and enhance the natural environment, by:

Prioritising environmental issues to protect the natural environment and minimising negative impacts.

Optimising the use of resources, including minimising carbon throughout the value chain.

Engaging with the community to improve the local environment in a meaningful way.

VALUE THEIR WORKFORCE

Constructors must create a supportive, inclusive, and healthy workplace, by:

Actively encouraging and supporting an inclusive and diverse workplace.

Proactively supporting safe working, mental and physical wellbeing at work.

Providing workplaces that are, well maintained, clean and secure from physical and biological hazards.

FOR MORE INFORMATION, CALL 0800 783 1423

RAISING STANDARDS, BUILDING TRUST.
CCSCHEME.ORG.UK

10.8 Residual Effects

There are no negative residual effects associated with the socio-economic assessment and population & human health assessment.

10.9 Statement of Significance

There are no negative residual significant effects associated with the socio-economic assessment and population & human health assessment.

About the Author

Dr Bryony Turner has been working in the field of socio-economics for over 25 years. Her work in the field started in 1999 when she worked for Shell UK as a Sustainability Consultant (whilst studying for her Doctorate) and her focus was on developing community consultation practices and developing modelling tools for resource efficiency and product stewardship. She has undertaken socio-economic and consultation exercises for a number of major infrastructure projects including proposed nuclear power stations (which she was pleased to gain experience of working on with the guidance of Professor John Glasson, the Academic noted in the MAU scoping response). She has also undertaken community consultation work with the nuclear industry looking at key issues such as treatment of legacy wastes. She has also undertaken community consultation programmes associated with planning and EIA for a wide variety of projects from roads and waste projects through to redevelopment schemes.

As a basis for her professional experience she has a Masters in Environmental Impact Assessment and a Doctorate from the University of Surrey that focused on incorporating sustainability into decision making.

11 ACCIDENTS AND NATURAL DISASTERS

11.1 Introduction

This chapter reports the outcome of the assessment of likely significant environmental effects arising from the proposed development on of the vulnerability of the proposed development to the risk of major accidents and natural disasters (A&ND).

Impacts during the construction phase and operational phase of the proposed development are assessed. For the purpose of the EIA, the vulnerability of the proposed development to an A&ND event is anticipated to be no worse than that for the construction phase following the implementation of the risk management plans for decommissioning. The construction phase and decommissioning are therefore considered together.

This includes an assessment of the reasonably foreseeable worst-case environmental consequences (i.e. the likely significant effects), the measures envisaged to prevent or mitigate the likely significant adverse effects of such events on the environment, and details of the preparedness for and proposed response to A&ND hazards and threats relevant to the construction and operation of the proposed development.

The underlying objective of this assessment is to identify appropriate precautionary actions, to prevent or mitigate potentially significant risks associated with A&ND.

The Institute of Environmental Management and Assessment (“IEMA”) ‘Major Accidents and Disasters in EIA: A Primer’ (September 2020), hereafter referred to as ‘The Primer’ was reviewed and informed whether there was potential for significant impacts to occur as a result of the proposed development. The Primer provides three tests as follows:

- *Is the development itself a source of major accidents or is vulnerable to disasters?*
- *Does the Development Interact with external hazards or associated activity*?
- *If an external major accident or disaster occurred would the existence of the development increase risk of significant effects to environmental receptors?*

Major accidents and/or disasters can be scoped out of the assessment if it can be clearly demonstrated that:

1. *there is no source-pathway-receptor linkage of a hazard that could trigger a major accident and/or disaster or potential for the scheme to lead to a significant environmental effect; or*
2. *all possible major accidents and/or disasters are adequately covered elsewhere in the assessment or covered by existing design measures[104] or compliance with legislation and best practice.*

It is expected that the collated and grouped hazard identification record will hold some information that may not be relevant to the overall assessment.

At this stage it is possible to consolidate the hazard identification record by screening out any Risk Events that meet the following criteria:

- *there is no source-pathway-receptor linkage;*
- *the consequence does not meet the criteria of a significant environmental effect, and therefore the grouped Risk Event is not a potential major accident and/or disaster; or*
- *the consequence and likelihood of the risk is high, to the extent that it is considered unacceptable to the development and has therefore been designed-out or otherwise managed,*

[104] For instance, altering the internal spatial layout of a scheme to simply avoid a hazard could be embedded as a primary mitigation measure at the scoping stage.

11.2 Scoping and Consultation

A scoping report for the proposed development was submitted by EnviroCentre on behalf of the Applicant to NAC and Scottish Government’s Marine Directorate (SGMD) in October 2023.

11.2.1 Scoping opinions

Formal scoping opinions were received from NAC on 20 December 2023 and the Marine Directorate on 28 February 2024. The scoping opinion from NAC did not provide comment on A&ND. The scoping opinion from the Marine Directorate included a consultation response on A&ND from the Marine Analytical Unit, which stated:

The Applicant has considered accidents and natural disasters within Section 3 of the Scoping Report with consideration of potential impact on accidents and natural disasters in Section 3.3. The Applicant proposes that accidents and natural disasters are scoped out.

The Scottish Ministers acknowledge the Applicant’s consideration of the Institute of Environmental Management and Assessment (“IEMA”) ‘Major Accidents and Disasters in EIA: A Primer’ to assess whether or not to scope in accidents and natural disasters. However, the Scottish Ministers do not consider that the Applicant has provided sufficient evidence to justify scoping out the risk of accidents and natural disasters. Additionally the Scottish Ministers note that the Applicant has only provided consideration of the construction phase. Consequently, accidents and natural disasters must be scoped in for further assessment in the EIA Report for construction and operational phases.

In doing so, the Applicant must include a description and assessment of the likely significant effects deriving from the vulnerability of the Proposed Works to major accidents and disasters within the EIA Report. The Applicant should make use of appropriate guidance, including the IEMA ‘Major Accidents and Disasters in EIA: A Primer’, as referenced in the Scoping Report, to better understand the likelihood of an occurrence and the Proposed Works’ vulnerability to or ability to cause a potential accident or disaster.

The Scottish Ministers advise that existing sources of risk assessment or other relevant studies should be used to establish the baseline rather than collecting survey data and note the IEMA Primer provides further advice on this. This should include the review of the identified hazards from your baseline assessment, the level of risk attributed to the identified hazards and the relevant receptors to be considered.

The assessment must detail how significance has been defined and detail the inclusions and exclusions within the assessment. Any mitigation measures that will be employed to prevent, reduce or control significant effects should be included in the EIA Report.

11.2.2 Further consultations during the assessment

In addition to consultation undertaken during EIA Scoping Table 11-1 shows what consultation was undertaken during the assessment.

Table 11-1: Additional Consultation During Assessment

Date	Consultee	Comment
25/03/2024	Christian Farmer: (Gerald Eve LLP) representing EDF Energy, Hunterston B	Microsoft Teams meeting to introduce the project team (EnviroCentre and Clydeport) and the proposed

Date	Consultee	Comment
		development to EDF Energy. Following the meeting a package of project information was issued to EDF Energy for review and comment. No further communication was received from EDF Energy.
10/04/2024	Roger GA Wrayford: Magnox, Hunterston A	Microsoft Teams meeting to introduce the project team (EnviroCentre and Peel Ports) and the proposed development to Magnox. During the meeting it was commented by Roger GA Wrayford that it was unlikely the proposed development would impact Hunterston A. Following the meeting a package of project information was issued to EDF Energy for review and comment. No further communication was received from Magnox.

11.3 Policy, Legislation and Guidance

11.3.1 Planning Policy Context

National Planning Framework 4

National Planning Framework 4 (NPF4) was adopted in February 2023, replacing the previous National Planning Framework 3 (NPF3) and forming part of the Development Plan. The Scottish Planning Policy (SPP) (2014) was amalgamated with NPF4 in the adoption of the new framework.

HCY is listed as a Strategic Asset within NPF4. Hunterston is a strategic asset with deepwater access, where there are plans for new economic development and employment uses.

Policies considered relevant from a A&ND perspective are outlined below:

Policy 23: Health and Safety. The intent of this policy is to protect people and places from environmental harm, mitigate risks arising from safety hazards and encourage, promote and facilitate development that improves health and wellbeing.

Policy 23 provides the following detail:

a) Development proposals that will have positive effects on health will be supported. This could include, for example, proposals that incorporate opportunities for exercise, community food growing or allotments.
b) Development proposals which are likely to have a significant adverse effect on health will not be supported. A Health Impact Assessment may be required.
c) Development proposals for health and social care facilities and infrastructure will be supported.
d) Development proposals that are likely to have significant adverse effects on air quality will not be supported. Development proposals will consider opportunities to improve air quality and reduce exposure to poor air quality. An air quality assessment may be required where the nature of the proposal or the air quality in the location suggest significant effects are likely.
e) Development proposals that are likely to raise unacceptable noise issues will not be supported. The agent of change principle applies to noise sensitive development. A Noise Impact Assessment may be required where the nature of the proposal or its location suggests that significant effects are likely.
f) Development proposals will be designed to take into account suicide risk.
g) Development proposals within the vicinity of a major accident hazard site or major accident hazard pipeline (because of the presence of toxic, highly reactive, explosive or inflammable substances) will consider the associated risks and potential impacts of the proposal and the major accident hazard site/pipeline of being located in proximity to one another.
h) Applications for hazardous substances consent will consider the likely potential impacts on surrounding populations and the environment.
i) Any advice from Health and Safety Executive, the Office of Nuclear Regulation or the Scottish Environment Protection Agency that planning permission or hazardous substances consent should be refused, or conditions to be attached to a grant of consent, should not be overridden by the decision maker without the most careful consideration.
j) Similar considerations apply in respect of development proposals either for or near licensed explosive sites (including military explosive storage sites).

North Ayrshire Council Adopted Local Development Plan (2019)

Policy 35: Hazardous Installations and Substances

Proposals for development in the vicinity of major-accident hazard sites for example within Health and Safety Executive consultation zones, or the designated safeguarding areas for civilian infrastructure (such as pipelines, airports, power stations) or other sites should take into account the potential impacts on the proposal and the major-accident hazard site of being located in proximity to one another.

Proposals for development involving the use, transmission or storage of hazardous substances will not be supported where there would be significant adverse impacts on the environment or health and safety.

11.3.2 National Legislation

The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017

Regulation 5, Part 4 of the Regulations states that:

The effects to be identified, described and assessed under paragraph (2) include the expected effects deriving from the vulnerability of the works to risks, so far as relevant to the works, of major accidents and disasters.

Schedule 4, paragraph 9 requires an Environmental Impact Assessment Report (EIAR) to provide:

A description of the expected significant adverse effects of the works on the environment deriving from the vulnerability of the works to risks of major accidents and/or disasters which are relevant to the project concerned.

Health and Safety at Work etc. Act 1974

The Act provides the framework for the regulation of workplace health and safety in the UK. It provides a legal framework for the provision of safe plant and equipment and prevention of harm to people from occupation hazards present in a workplace, including emergencies which may affect those offsite, or visiting the site.

Many associated regulations have been made under the HSWA including, but not limited to the following of relevance to the control of A&NDs of the proposed development:

Construction (Design and Management) Regulations 2015 (CDM)

These regulations place legal duties on almost all parties involved in construction work. The regulations place specific duties on clients, designers and contractors, so that health and safety is taken into account throughout the life of a construction project from its inception to its subsequent final demolition and removal.

The Client, Designers and Contractors have to avoid foreseeable risks so far as is reasonably practicable by eliminating hazards associated with the design, construction, operation and maintenance aspects of the Proposed Scheme.

Therefore, the regulations ensure that mechanisms are in place to continually identify, evaluate and manage safety risks throughout the design, construction phase and operational phase of the Proposed Scheme. Many of the risks identified and managed out at the design phase also serve to eliminate or reduce the risk of a major accident (and therefore environmental consequence) occurring during the construction phase, operational phase and maintenance phase.

The Town and Country Planning (Hazardous Substances) (Scotland) Regulations 2015

The controls ensure that hazardous substances can be kept or used in significant amounts only after the responsible authorities have had the opportunity to assess the degree of risk arising to persons in the surrounding area and to the environment. Even after all reasonably practicable measures have been taken to ensure compliance with health and safety legislation (e.g. Health and Safety at Work etc Act 1974); there will remain the residual risk of an accident which cannot entirely be eliminated.

Hazardous substance consents focus on ensuring the safety of the public around the consented site from potential major accident hazards.

Contravention of hazardous substances regulations (e.g. failing to obtain the required consent or failing to comply with the conditions of a consent) could expose people in the surrounding area to serious and immediate risk. Consequently, contravention of the regulations is a criminal offence and the Council has the power to prosecute offenders, which may result in an unlimited fine.

Pollution Prevention and Control (Scotland) Regulations 2012.

An Environmental Permit will be required for the operation of the Proposed PCC Site in accordance with The Pollution Prevention and Control (Scotland) Regulations 2012.

The primary purpose of the regulations is to protect the environment and human health by minimising emissions to air, water, and land. The requirements include obtaining permits, implementing pollution prevention measures, monitoring emissions, and reporting to regulatory authorities. The regulations apply to industrial facilities in Scotland that engage in specified activities listed under the regulations. Compliance with these regulations is essential to operate legally and sustainably while minimising their environmental impact.

Control of Major Accident Hazards Regulations 2015 (COMAH)

The purpose of the COMAH Regulations is to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any accidents which do occur.

The Dangerous Substances and Explosive Atmospheres Regulations 2002

The Dangerous Substances and Explosive Atmospheres Regulations 2002 are concerned with protection against risks from fire, explosion and similar events arising from dangerous substances used or present in the workplace. From June 2015 DSEAR also covers gases under pressure and substances that are corrosive to metals.

Other Relevant Legislation

- Occupiers Liability (Scotland) Act 1960;
- The Civil Contingencies Act 2004 and the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005;
- The Provision and Use of Work Equipment Regulations 1998;
- Classification, Labelling and Packaging (CLP) Regulations 2015;
- Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016; and
- Pressure Equipment (Safety) Regulations 2016.

11.3.3 Guidance

There is no specific guidance available which sets out the approach for undertaking a A&ND assessment within an EIA. However, the scope of the assessment has been developed with reference to “Major Accidents and Disasters in EIA: An IEMA Primer” (IEMA, 2020) which lays out emerging best practice. In addition to this guidance, there is a considerable amount of information and guidance available to developers on the identification and control of major hazards associated with industrial chemical processes, the storage and use of chemicals, and major accident hazard pipelines conveying hazardous fluids.

Unlike other assessments within the EIAR, the assessment does not deal with likely effects. The scope of this assessment focuses on potential sudden events of low likelihood, which may reasonably occur, resulting in major negative impacts on receptors. This approach directs the assessment to focus on “low likelihood but potentially high consequence events” such as a major spill, explosion, fire etc. Smaller incidents (spills, sediment loss etc.) are addressed elsewhere in this EIAR in the relevant topic chapters. This chapter focuses on major events only.

The IEMA “Primer” approach defines a “significant environmental effect” as one which “could include the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration” and this definition has been adopted for the purposes of this assessment.

The National Risk Register 2023 (NRR contains 89 threats that have been identified as having the potential to significantly impact the UK's safety, security, or critical systems at a national level. These threats include terrorism, cyber-attacks, state threats, pandemics, wildfires, and industrial action. In highlighting these risks, the NRR provides a foundation to enhance collective resilience and ensure the protection of our nation's vital interests.

11.4 Methodology

Current EIA practice already includes an assessment of some potential accidents and disaster scenarios such as pollution incidents to ground and watercourses as well as assessment of flooding events. These are described in detail in the relevant EIAR in the following Chapters: Chapter 5 (Biodiversity), Chapter 8 (Traffic and Transport), Chapter 9 (Water Environment), Chapter 13 (Supporting Assessments: Air Quality and Carbon Impact Assessment), and site investigation reports submitted as part of the planning application.

The IEMA Primer defines Major Accidents as ‘*Events that threaten immediate or delayed serious environmental effects to human health, welfare and/ or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train*

derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.'[105]

The impact of major accidents can be significant, with the potential to impact people both on and off-site, assets and property on and off-site, and the surrounding environment.

Disasters can be a natural hazard such as earthquakes, storms, flooding etc. or a man-made/external hazard (e.g. act of terrorism) which can result in consequences for people or the environment.

The scope and methodology of this assessment is centred on the understanding that the proposed development will be designed, built and operated in line with best international current practice. As such, major accidents resulting from the proposed development would be unlikely.

A risk analysis-based methodology that covers the identification, likelihood and consequence of major accidents and/or disasters has been used for this assessment.

The assessment of the risk of major accidents and/or disasters considers all factors defined in the EIA Regulations that have been considered in this EIAR, i.e. population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and the landscape.

The EIA Regulations requires that the EIAR shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape deriving from (amongst other things) the "*expected effects deriving from the vulnerability of the works to risks, so far as relevant to the works, of major* accidents *and disasters.*"

The information relevant to major accidents and/or disasters to be included in the EIAR is set out Schedule 4 of the EIA Regulations as follows:

> *"A description of the expected significant adverse effects of the works on the environment deriving from the vulnerability of the works to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to legislation of the European Union such as Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC(38) or Council Directive 2009/71/Euratom establishing a community framework for the nuclear safety of nuclear installations or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of the Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies."*

All low consequence events, whatever their likelihood, do not meet the definition of A&ND as defined in the Institute of Environmental Management and Assessment's (IEMA) Primer (Institute of Environmental Management & Assessment, 2020). For example, minor spills which may occur during the construction phase, but would be limited in area and volume and temporary in nature, do not meet the definition of a major accident. Such minor events would be dealt with under the construction contractor's Environmental Management System (EMS) and do not fall within the scope of this assessment. Similar events occurring during the operational phase and decommissioning would adopt the same approach.

This assessment focuses on low likelihood, but potentially high consequence events as illustrated in Figure 2 in IEMA's Primer (Figure 11.1).

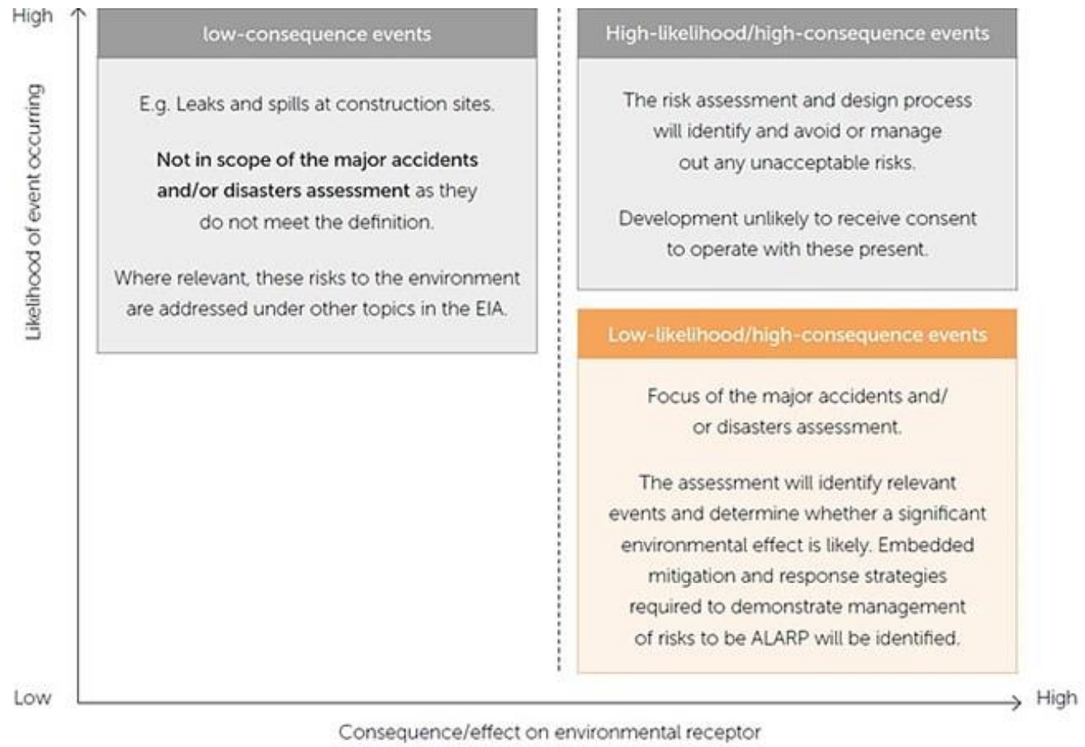


Figure 11-1: Summary of Risk Events considered in the Scope of the Assessment for Major Accidents and Disasters

In accordance with the approach presented in the IEMA Primer (IEMA, 2020), this assessment follows three stages (screening, scoping, assessment) as follows:

- **Stage 1 Screening:** The IEMA Primer (2020) states that "during screening it should be sufficient to identify if a development has a vulnerability to major accidents and / or disasters and to consider whether a development could lead to a significant effect."

- **Stage 2 Scoping**: Scoping is undertaken to determine in more detail whether there is potential for significant effects as a result of major accidents and/or disasters associated with the Proposed Scheme. If the Proposed Development is screened in for the assessment of impacts in relation to major accidents and/or disasters at Stage 1, Stage 2 aims to provide a more detailed determination as to whether there is potential for significant effects.

The IEMA Primer (2020) further states that the assessment of impacts in relation to major accidents and/or disasters may be scoped out if it can be shown that:

  - "There is no source-pathway-receptor linkage of a hazard that could trigger a major accident and/or disaster or potential for the scheme to lead to a significant environmental effect"; or

[105] Major Accidents and Disasters in EIA: An IEMA Primer- https://www.iema.net/resources/reading-room/2020/09/28/major-accidents-and-disasters-in-eia-an-iema-primer

- "All possible major accidents and/or disasters are adequately covered elsewhere in the assessment or covered by existing design measures or compliance with legislation and best practice."

The Primer further notes that:

"*A major accidents and/or disasters assessment will be relevant to some developments more than others, and for many developments it is likely to be scoped out of the assessment*".

Stage 3 Assessment: The assessment stage provides further understanding on the likelihood of a risk event occurring and identifies the requirement for further mitigation. If hazard types are screened in at Stage 2, they are brought forward to Stage 3 for detailed consideration of the potential for significant impacts to occur. The following exercises are carried out in the Stage 3 Assessment:

- Setting out the baseline: Hazard identification and receptor tagging;
- Assessment:
  - Identifying reasonable worst-case impact;
  - Selecting the grouped risk events that need further assessment;
  - Understanding the likelihood of a risk event occurring; and
- Mitigation: Identifying the requirements for secondary mitigation.

11.4.1 Potential Impact of the Proposed Development

As discussed above, the scope and methodology of this assessment is centred on the understanding that the proposed development would be designed, built and operated in line with best international current practice and, as such, the vulnerability of the proposed development to risks of major accidents and / or disasters is considered low.

Site Specific Risk Assessment

A site-specific risk assessment identifies and quantifies risks focusing on unplanned, but possible and plausible events occurring during the construction and operation of the proposed development. The approach to identifying and quantifying risks associated with the proposed development has been undertaken by means of a site-specific risk assessment. The following steps were undertaken as part of the site-specific risk assessment:

- Risk identification.
- Risk classification, likelihood and consequence.
- Risk evaluation.

Risk Identification

The identification of plausible risks has been carried out in consultation with relevant specialists. A Risk Register which was prepared during the design of the proposed development was also reviewed in order to inform the identification of risks for this assessment. The identification of risks has focused on non-standard but plausible incidents that could occur at the proposed development during construction and operation.

Risks are identified in respect of the developments: -

1) Potential vulnerability to disaster risks.
2) Potential to cause accidents and / or disasters.

Risk Classification

While the "IEMA Primer" provides information on assessment, it does not include a "risk classification". Other regimes such as COMAH were also reviewed, and again no risk classification was available for this type of development, The lack of UK-specific approach meant the search for a risk classification had to be widened and the likelihood of occurrence, classification of risk and risk matrix used for the assessment is based on 'A National Risk Assessment for Ireland 2020' as shown in the following tables. The document was published by the Irish Government, but its matrix for determining risk follows a logical approach and one that has been used for the methodology for this assessment.

Having identified the potential risks, the likelihood of occurrence of each risk has been assessed. An analysis of safety procedures and proposed environmental controls was considered when estimating likelihood of identified potential risks occurring. Table 11-2 defines the likelihood ratings that have been applied.

The approach adopted has assumed a 'risk likelihood' where one or more aspects of the likelihood description are met, i.e. any risk to the proposed development less than extremely unlikely to occur has been excluded from the assessment. The likelihood rating assigned to each risk has assumed that all proposed mitigation measures and/or safety procedures are in place and have succeeded in reducing or preventing the major accident and/or disaster occurring.

Assessment are evaluated using criteria outlined in Table 11-2 (likelihood of occurrence)[106], Table 11-3 (consequence of impact[107]) and Table 11-4 (risk assessment), which have been adapted from the following:

- Major Accidents and Disasters in EIA: A Primer (IEMA 2020);
- UK National Risk Register 2023.
- National Risk Assessment for Ireland 2020.

Table 11-2: Risk Classification Table – Likelihood of Occurrence.

Rating	Percentage Chance
1	<0.2%
2	0.2-1%
3	1-5%
4	5-25%
5	>25%

Classification of Consequence

The consequence rating assigned to each risk has assumed that all proposed mitigation measures and / or safety procedures have failed to prevent the major accident and / or disaster occurring. The consequence of the impact if the event occurs has been assigned as described in Table 11-3. The consequence of a risk to the proposed development has been determined where one or more aspects of the consequence description are met, i.e. risks that have no consequence have been excluded from the assessment.

Table 11-3: Classification of Impact

Rating	Classification	Significance of Effects	Description
1	Very Low Impact	Minor	• People: Deaths less than 1 in 250,000 people for population of interest OR Critical injuries/illness less than 1 in 250,000 OR Serious injuries less than 1 in 100,000 OR Minor injuries only; • Environment: Simple, localised contamination only; • Economic: Up to 1% of Annual Budget; • Social: Limited disruption to community
2	Low Impact	Limited	• People: Deaths greater than 1 in 250,000 people for population of interest OR Critical injuries/illness greater than 1 in 250,000 OR Serious injuries greater than 1 in 1 100,000; • Environment: Simple, regional contamination, effects of short duration;

[106] https://assets.publishing.service.gov.uk/media/64ca1dfe19f5622669f3c1b1/2023_NATIONAL_RISK_REGISTER_NRR.pdf

[107] https://www.gov.ie/ga/preasraitis/5e685-national-risk-assessment-for-ireland-2020/

Rating	Classification	Significance of Effects	Description
			• Economic: Greater than 1% of Annual Budget; • Social: Community is functioning but with considerable inconvenience.
3	Moderate Impact	Moderate	• People: Deaths greater than 1 in 100,000 people for population of interest OR Critical injuries/illness greater than 1 in 100,000 OR Serious injuries greater than 1 in 40,000; • Environment: Heavy contamination, localised effects of extended duration; • Economic: Greater than 2% of Annual Budget; • Social: Community is functioning poorly.
4	High Impact	Significant	• People: Deaths greater than 1 in 40,000 people for population of interest OR Critical injuries/illness greater than 1 in 40,000 OR Serious injuries greater than 1 in 20,000; • Environment: Heavy contamination, widespread effects of extended duration; • Economic: Greater than 4% of Annual Budget; • Social: Community only partially functioning
5	Very High Impact	Catastrophic	• People: Deaths greater than 1 in 20,000 people for population of interest OR Critical injuries/illness greater than 1 in 20,000; • Environment: Very heavy contamination, widespread effects of extended duration; • Economic: Greater than 8% of Annual Budget; • Social: Community is unable to function without significant support.

Risk Evaluation

Hazards are evaluated and categorised using a risk matrix, developed using the approach and information outlined in both the risk assessment documents and provisions outlined in the IEMA Primer. This matrix is used to determine the level of significance of each risk for each hazard scenario. Risks have been grouped in three categories outlined in Table 11-4: red refers to 'High Risk' scenarios that have an assessment score between 15 and 25, amber refers to 'Medium Risk' scenarios that score between 8 and 12, and green refers to 'Low Risk' scenarios scoring between 1 and 6.

Table 11-4: Levels of Significance

Likelihood	Consequence Rating				
5. V. Likely	5	10	15	20	25
4. Likely	4	8	12	16	20
3. Unlikely	3	6	9	12	16
2. V. Unlikely	2	4	6	8	10
1. Ext. Unlikely	1	2	3	4	5
	1.Minor	2. Limited	3. Moderate	4. Significant	5. Catastrophic

Significant effects resulting from A&ND are adverse effects that are described as 'Significant', 'Very Significant' or 'Profound'. Consequently, A&NDs that fall within Amber or Red Zones ('Medium' or 'High' Risk Scenarios) are brought forward for further consideration and assessment for further mitigation.

11.5 Baseline

As described in Chapter 2: Proposed Development, the Proposed Development is situated within Hunterston Construction Yard (HCY).

The site is a relatively flat area of land approximately 40 Ha in size (800m x 500m at its widest point). It is accessible from the A78 via the Hunterston Roundabout and Power Station Road leading onto Oilrig Road. The site is centred at Grid Reference NS 185 530.

The site also includes marine areas as indicated by the redline boundary.

HCY has historically been used for industry and currently comprises an access road, service infrastructure, deep dry dock (approximately 20m deep) cut off from the Firth of Clyde by a sand bund and a hammerhead quay, the site is armour stone protected. HCY was constructed in the 1970s by infilling onto Hunterston and Southannan Sands. The yard was used to manufacture an oilrig base, dry dock and a gravity base tank prior to falling out of use in circa 1996. More recently, the site has been used as a wind turbine test site, however these features have been removed.

The site is currently vacant although a planning application (ref 23/00606/pp) has been submitted for preparation works, establishment of compound area and initial groundworks including landscaping and other required infrastructure associated with a proposed aquaculture facility on the northeastern corner of the yard. In addition, there will be temporary use of the site for the Fastrig demonstration project.

11.5.1 The Proposed Development

The proposed development incorporates upgrading of the HCY into a harbour facility with a large working platform. To facilitate this development specific construction elements will be undertaken which includes:

As noted within Chapter 2, the proposed development will incorporate:

- Enabling works;
- Demolition works of existing structures including removal of the base of the former dry dock;
- Infilling of the former dry dock basin to provide additional land for general industrial purposes;
- Ground improvement works including general ground works site platforming and levelling and piling;
- The construction of a new quay and associated quayside infrastructure on the western edge of the site to berth vessels;
- Capital dredging to -12m chart datum to enable marine vessel access to quay areas;
- Works to include removal of the existing dock entrance bund, and/or removal of existing land to facilitate the construction of appropriate berths;
- Installation of navigational aids;
- Provision of site utilities including lighting, substations, drainage, security fencing, access gates and CCTV;
- Erection of temporary site offices and staff welfare buildings to accommodate site workforce.

It is recognised that potential effects of the proposed development on the Applicant's employees and/ or its contractors and suppliers (e.g. construction, operational and maintenance staff) are managed through compliance with other health and safety legislation. Through compliance with health and safety legislation, risks to employees will be mitigated to as low as reasonably practicable (ALARP) and no further mitigation will be available. However, for completeness, risks to employees and/ or contractors, including those at neighbouring facilities, are included within the assessment results.

The Applicant proposes to adopt appropriate measures to provide a secure boundary for the Proposed Development which will reduce the likelihood of trespass to ALARP. As no further mitigation will be available, effects on these receptors groups will be mitigated to ALARP.

11.5.2 The Surrounding Area

The site is located on a promontory which extends out into the Firth of Clyde with Hunterston Power Stations ~1km to the south, Fairlie village ~1.9km to the northeast, the island of Great Cumbrae ~1.4 km to the northwest and the redundant Hunterston Coal Terminal ~500m to the east. The Southannan and Hunterston Sands Sites of Special Scientific Interest (SSSI) bound the site to the northeast, east and southeast.

11.5.3 Receptor Sensitivity

Receptors considered in this assessment include:

- Population and human health of members of the public, local communities and nearby workers at other facilities, if relevant;
- Biodiversity, with particular attention to species and habitats protected under the Conservation (Natural habitats, &c.) Regulations 1994 (as amended)
    - Terrestrial Habitats
    - Freshwater Habitats
    - Marine Habitats
- Land, soil, water, air and climate;
- Groundwater bodies
- Property and material assets, cultural heritage and the landscape; and
- The interaction between the factors above.

11.5.4 Office for Nuclear Regulation (ONR)

Hunterston A power station is a twin reactor Magnox power station. It was shutdown in 1990 and is now being decommissioned. The station, Scotland's first civil nuclear generating station and, at the time of opening, the largest in operation anywhere in the world generated around 360MW of electricity during its 25 year operating life.

Regular inspections at Hunterston A are undertaken and inspection reports are housed on the public register of reports, guidance and publications.[108]

Hunterston A was powered by twin Magnox reactors until it ceased electricity production in 1990 and is now being decommissioned by Magnox Limited. De-fuelling was completed in 1995. Decommissioning activities continue to focus on 2 major areas: the ongoing decommissioning of the cartridge (nuclear fuel) cooling pond; and making progress towards ensuring that all higher activity waste is stored in a passively safe manner.

Most of the radioactivity in liquid effluent discharged from the Hunterston A site over the last few years has arisen from the cartridge cooling pond. The draining of the cartridge cooling pond is now largely complete. However, there is still a need to manage the remaining radioactive sludges from several areas associated with the pond.

In terms of safe management of legacy higher activity waste at Hunterston A, Magnox Limited are in the process of commissioning the Solid Intermediate Level Waste Encapsulation plant (SILWE). The Wet Intermediate Level Waste Retrieval and Encapsulation Plant (WILWREP) underwent active commissioning in early 2017 and is currently undergoing modifications in order to process radioactively contaminated acid wastes. Processing of the legacy higher activity waste, present at the Hunterston A site has begun and will be processed through either SILWE or WILWREP, with the current plans being to make safe by encapsulating it in a grout mixture. The encapsulated waste will then be transferred to the Intermediate Level Waste Store (ILWS) for storage.

To date there have been no significant incidents.

11.5.5 COMAH Establishments

The Control of Major Accident Hazards (COMAH) Regulations 2015 place an obligation on the operators of establishments that store, handle or process dangerous substances above certain thresholds to take all necessary measures to prevent major accidents and to limit the consequences for human health and the environment. Under the Regulations, a COMAH establishment may qualify as upper tier or lower tier, depending on the inventory of dangerous substances; sites that store, handle or process dangerous substances below a certain threshold do not qualify as establishments under the Regulations.

The COMAH 2015 Public Information Register indicates that there is one COMAH establishment located within 3 miles of the proposed development site, Hunterston B Power Station (Table 11-5).[109]

There are two types (tiers) of establishment which are subject to COMAH, known as ‘Upper Tier’ and ‘Lower Tier’ depending on the quantity of dangerous substances they hold. Upper Tier establishments will hold greater quantities of dangerous substances meaning that additional requirements are placed on them by the Regulations.

Table 11-5: COMAH Establishments

Establishment Name	Operator Name	Tier	Postcode
Hunterston B Power Station	EDF Energy Nuclear Generation Limited	Lower Tier	KA23 9QX

Table 11-6 provides information about relevant dangerous substances at Hunterston B Power Station which could cause a major accident.[110]

Table 11-6: Substances and Emergency Information

Hazard Classification of Relevant Dangerous Substances	▪ Hazardous to the aquatic environment ▪ Other health hazards (named carcinogen) ▪ Oxidising gases ▪ Petroleum products and alternative fuels
Principle Dangerous Characteristics of These Substances In Simple Terms	▪ Causes skin burns and eye damage ▪ Fire/explosion ▪ Flammable - gas, aerosol, liquid ▪ Gases under pressure ▪ May cause cancer ▪ Toxic if inhaled ▪ Toxic if swallowed ▪ Toxic in contact with skin ▪ Toxic to aquatic life
How public will be warned	Advice about the action to take in the event of a major accident will be given by local radio/TV station

Hunterston B was powered by a pair of advanced gas-cooled reactors (AGRs), referenced as Reactors 3 and 4 until it ceased electricity production in January 2022. The station is currently being defueled by EDF Energy Nuclear Generation Limited, and once it has achieved Fuel Free Verification, it will be transferred to the Nuclear Decommissioning Authority (NDA) Estate to be decommissioned by Magnox Limited. Both gaseous and liquid discharges are much lower during defueling than in the operational phase.

[108] https://www.onr.org.uk/publications/publication-search/?type=inspectionRecordPublication&site=Hunterston+A
[109] https://notifications.hse.gov.uk/COMAH2015/Search.aspx
[110] https://notifications.hse.gov.uk/COMAH2015/PublicInformation.aspx?piid=4039

In terms of safe management of legacy higher activity waste at Hunterston B, the preferred option is to use the Intermediate Level Waste Store (ILWS) on Hunterston A. Optioneering exercises are being carried out on the optimal solution for the Operational Waste Processing Facility (OWPF), which will manage the higher activity wastes arising from the station's operational life and the Decommissioning Waste Processing Facility (DWPF), which will be used to manage the lower activity waste arising from the decommissioning phase.[111]

Environmental monitoring in the area considers the effects of both Hunterston A and Hunterston B sites together. The most recent habits survey was conducted in 2017 (Dale, Smith, Tyler, Copplestone D, Varley, Bradley, Bartie and others, 2021). A new habits survey is scheduled to be undertaken in 2024.

The Radiation (Emergency Preparedness and Public Information) Regulations 2019 also requires the Council to determine the boundaries of the DEPZs (Detailed Emergency Planning Zones) around Hunterston B (see section 12.5.7).

11.5.6 Hunterston A and B (Combined)

The following is derived from the "*Radioactivity in food and the environment (RIFE) report 2022"* (Updated 2 November 2023).[72]

Doses to the public

The 'total dose' from all pathways and sources of radiation was less than 0.005mSv in 2022 or less than 0.5% of the dose limit, and down from 0.006mSv in 2021. The decrease in dose was mostly due to a lower concentration of plutonium-239+240 measured in mollusc species. The representative person was adults living near the site and a change from that in 2021 (adults consuming molluscs).

The estimated dose for seafood consumption was less than 0.005mSv in 2022, and down from that in 2021 (0.011mSv). The reason for this decrease in dose is the same as that contributing to the maximum 'total dose'.

The estimated dose for a terrestrial food consumer was 0.007mSv in 2022, which was less than 1% of the dose limit for members of the public of 1mSv and slightly down in comparison to that in 2021 (0.008mSv).

Gaseous discharges and terrestrial monitoring

Gaseous discharges are made via separate discharge points from the Hunterston A and Hunterston B stations. Hunterston A is in the decommissioning phase, and gaseous discharges from the site are low. Hunterston B began defueling Reactor 3 in May 2022 after a period of outage. As a consequence of being shut down, the gaseous discharges of carbon-14 and, to a lesser extent, sulphur-35, decreased in 2022, in comparison to those in 2021.

There is a substantial terrestrial monitoring programme which includes the analyses of a comprehensive range of wild and locally produced foods. In addition, air, freshwater, grass and soil are sampled to provide background information. The concentrations of radionuclides in air, milk, crops and fruit were generally low and similar to those in previous years (where comparisons can be made). Sulphur-35 was positively detected in grass at 2 different locations samples. As in recent years, europium-155 was positively detected in soil in 2022. Tritium, gross alpha and gross beta concentrations in freshwater were below the investigation levels for drinking water in the Water Supply (Water Quality) (Amendment) 2018 Regulations (retained from the European Directive 2013/51).

Most of the activity concentrations in air at locations near to the site were reported as less than values.

Liquid waste discharges and aquatic monitoring

Authorised liquid discharges from both Hunterston stations are made to the Firth of Clyde via the Hunterston B station's cooling water outfall. Hunterston B began defueling Reactor 3 in May 2022 after a period of outage. As a consequence of being shut down, the liquid discharges of tritium and, to a lesser extent, sulphur-35, decreased in 2022, in comparison to those in 2021.

The main part of the aquatic monitoring programme consists of sampling of fish and shellfish and the measurement of gamma and beta dose rates on the foreshore. Samples of sediment, seawater and seaweed are analysed as environmental indicator materials.

The results of aquatic monitoring in 2022 are show the concentrations of artificial radionuclides in the marine environment are predominantly due to Sellafield discharges, the general values being consistent with those to be expected at this distance from Sellafield. As in recent years, the concentrations of technetium-99 from Sellafield in crabs and lobsters around Hunterston were low in 2022. As in 2021, all cobalt-60 concentrations in sediments were reported as less than value in 2022. The plutonium-239+240 concentration in the scallop sample collected was significantly lower than the one observed in 2021. Gamma dose rates were generally similar in 2022, in comparison to those observed in recent years. Measurements of the beta dose rates over sand are reported as less than values in 2022. Caesium-137 concentrations in sediment have remained low over the last decade (Figure 4-2).

11.5.7 The Radiation (Emergency Preparedness and Public Information) Regulations 2019 DEPZs (Detailed Emergency Planning Zones).

The boundaries of the DEPZs must be 'on the basis of' the Operators' recommendations contained in their 'Consequences Report'. Historically the boundary was 2.4km from Hunterston A (now 0km), and 1km from Hunterston B, whereas the respective Consequences Reports propose a boundary of 2km for Hunterston B and 0km for Hunterston A (Figure 11-2).[112] The Council has limited powers to extend the boundary, but in the case of Hunterston B North Ayrshire Council recommended that there are practical implementation advantages in retaining within the DEPZ, those properties currently within the existing 2.4km boundary. It must be noted that the Council does not have legal powers to set a DEPZ which is significantly beyond this distance.

[111] https://www.gov.uk/government/publications/radioactivity-in-food-and-the-environment-rife-reports/rife-28-radioactivity-in-food-and-the-environment-2022

[112] North Ayrshire Council. Determination of the Detailed Emergency Planning Zone (DEPZ) for Hunterston B Nuclear Power Station, 16 January 2020

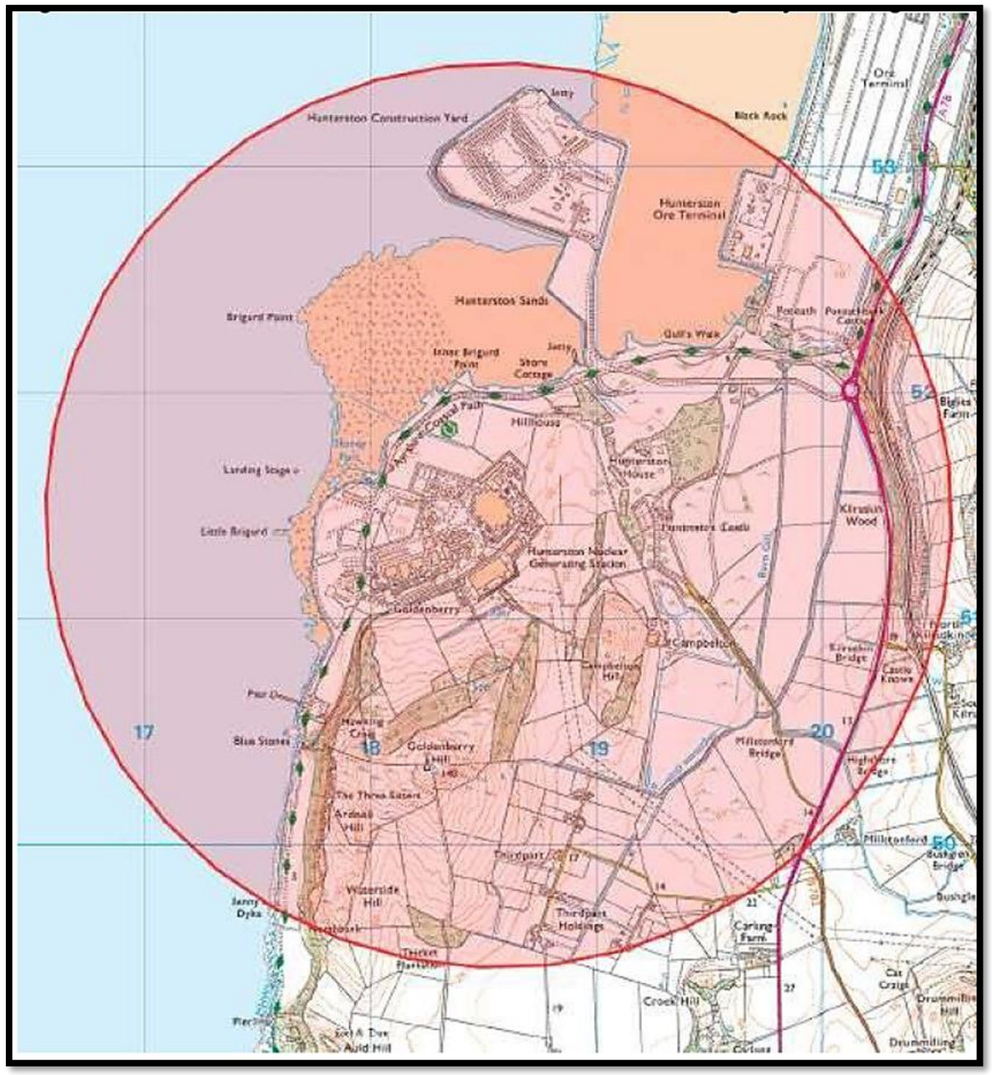


Figure 11-2: Recommended Minimum Distance for Detailed Emergency Planning

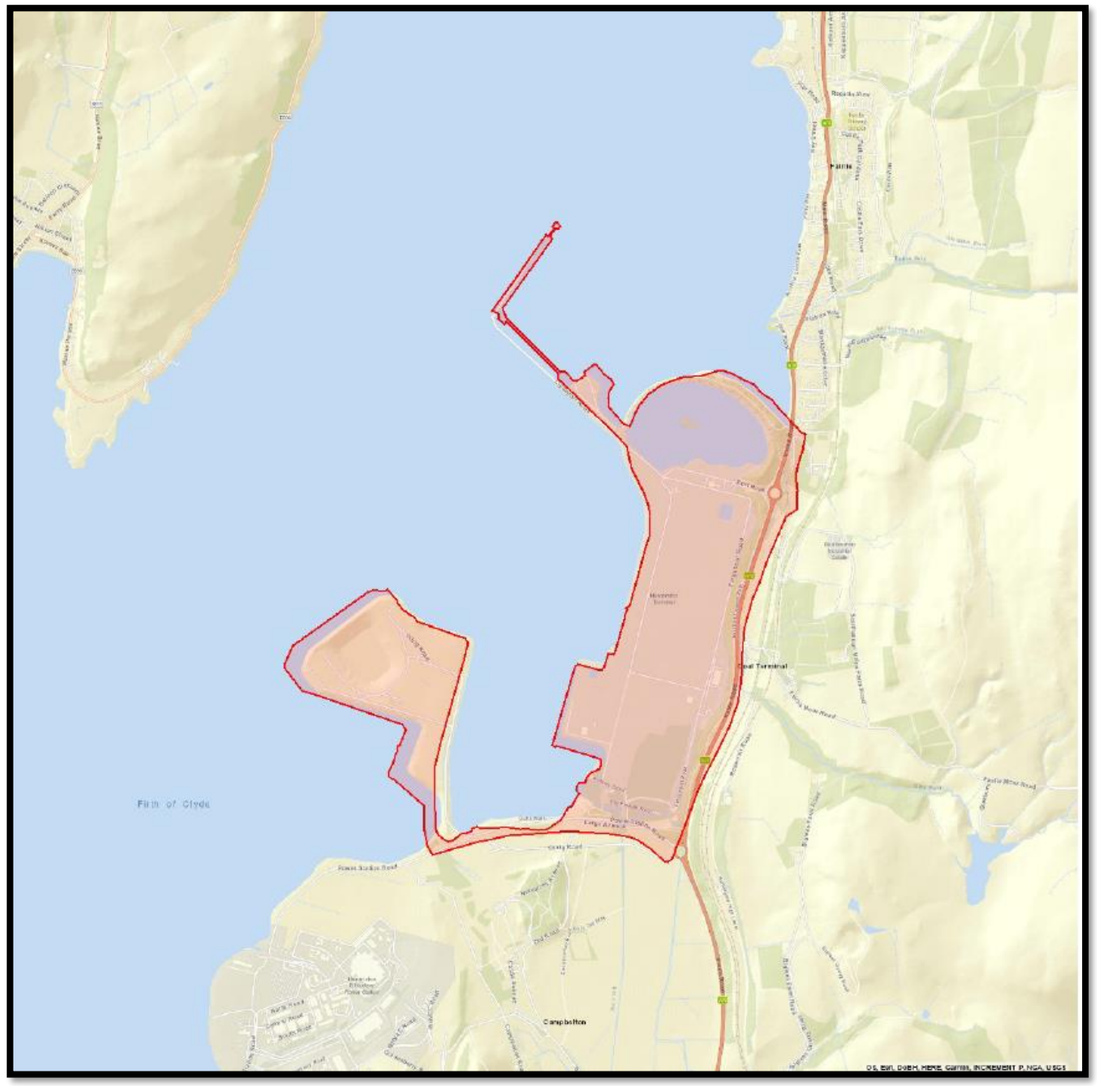


Figure 11-3: Search data map

11.5.8 Built Service Infrastructure

The Landmark Information Group - Utilities Report (29 July 2021) was completed in accordance with the standards defined under Survey Category D of PAS128, a Publicly Available Specification for underground utility detection, verification and location published by the British Standards Institution. The area covered by the search is shown in Figure 11-3.

A total of 19 utility companies were contacted and the following affected utilities were identified.

Table 11-7: Reponses Received

Utility	Category
ESP Utilities Group	Gas, Electric
LinesearchbeforeUdig	Other
Network Rail	Rail
Openreach - [British Telecommunications]	Telecom
Scottish Water	Water, Sewerage
SGN (Scotland Gas Networks)	Gas
SP Energy Networks - (Scotland)	Electric
Utility Assets	Electric

Table 11-8 identifies where no responses were received.

Table 11-8: No Response Received

Utility	Category
North Ayrshire Council	Council
Scottish Environment Protection Agency - (SEPA)	Environmental Agency
Transport Scotland - South West (Scotland Transerv)	Highways

Table 11-9 identified utilities that will not be affected.

Table 11-9: Not Affected Utilities

Utility	Category
C.A. Telecom UK - [Colt Technology Services]	Telecom
CityFibre Telecom	Telecom
GTC	Telecom, Gas, Electric, Water
Instalcom - [CenturyLink, Global Crossing, Fibernet & Fibrespan]	Telecom
SKY Telecommunications Services	Telecom
Verizon	Telecom
Virgin Media	Telecom
Vodafone	Telecom

11.5.9 Waste and Licensed Facilities

There are various relevant waste and licensed facilities regulated by SEPA under Waste and Pollution Prevention Control (PPC) licence/permit in North Ayrshire.[113]

Status As At 2022	Permit or Licence Number	Operator Organisation	Site Name and or Address	Location Details of Site National Grid Reference	Approx Distance to Hunterston*
Not authorised by SEPA	PPC/A/1038336	ENVA Scotland Limited	Old Mill Quarry, Beith	NS 39085 52325	~ 20 km
Operational	PPC/W/0020008	Smith Skip Ltd	Knowes Farm IV Landfill Site	NS 34250 55510	~ 15 km
Operational	PPC/A/1038061	W H Malcolm Ltd	Loanhead Quarry Beith	NS 36334 55530	~ 18 km

**Straight line*

Based on the distance from the proposed development no facilities are likely to be impacted by the proposed development.

11.5.10 Geohazards

The BGS Geoindex identifies that the superficial deposits at the site and the surrounding area comprise Holocene marine beach deposits formed of sands and gravels. Bedrock at the site consists of the Kelly Burn Sandstone deposit (Mainly red, cross-bedded, pebbly sandstone with subordinate conglomerate beds).

In the spring of 2018, Structural Soils Ltd. drilled 11 boreholes in the HYC area of the site. Boreholes were drilled to a maximum depth of 38.85m below ground level.

The borehole logs confirm that the reclaimed land that forms the HCY and Dry Dock area is comprised primarily of sand. Natural deposits beneath the reclaimed land comprise primarily sand and clay.

A limited intrusive investigation was undertaken by EnviroCentre Ltd. in July 2018 on the floor of the dry dock basin in the HCY. The purpose of the investigation was primarily to characterise shallow ground conditions in the peripheral areas between the existing concrete pads and to determine the presence and extent of unexposed hardstanding.

It was noted that ground conditions in the peripheral areas of the concrete pads were variable, with most having an upper layer of Type 1 angular hardcore underlain by red or light brown sand, or very occasionally by concrete. Water ingress occurred in several excavations with water present at between 0.2m and 1.1m below ground level. It is likely that groundwater level within the dry dock will be affected by the tidal state.

11.5.11 Earthquakes

Since the 1950's North Ayrshire has experiences a total of 66 earthquakes, within a 150 km radius (Figure 11-4).[114]

[113] https://www.sepa.org.uk/media/109568/landfill-capacity-2013.xls
[114] https://database.earth/earthquakes/united-kingdom/scotland/north-ayrshire

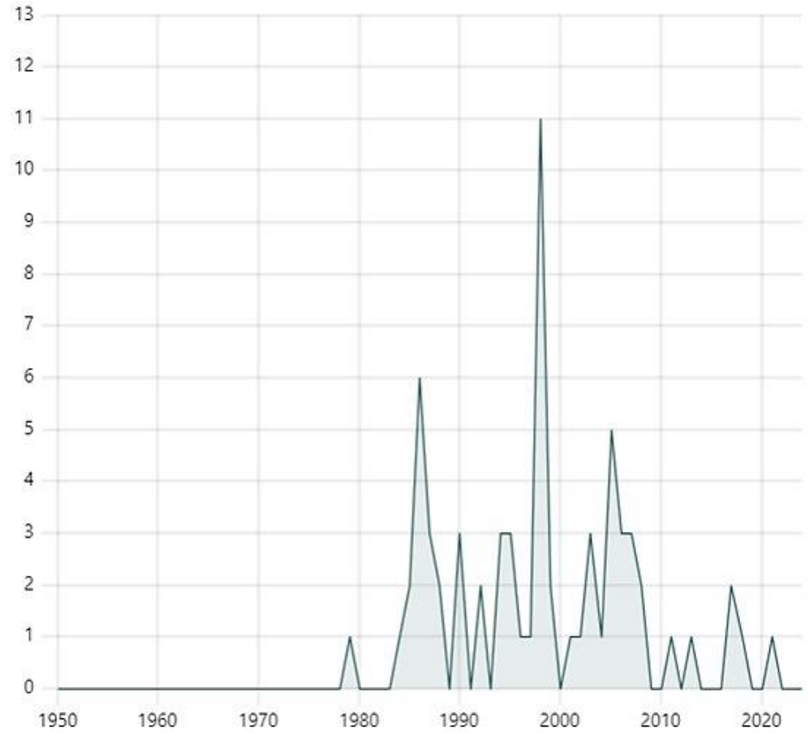


Figure 11-4: Earthquakes per Year in North Ayrshire 1950-2024

Table 11-10: Earthquake Magnitude Distribution

Magnitude	Earthquakes	Percentage
M 0	1	1.35%
M 1	12	16.22%
M 2	41	55.41%
M 3	10	13.51%
M 4	2	2.7%

Magnitude distribution for North Ayrshire was last updated at 2024-03-01 20:49:31

Table 11-11: Earthquake Magnitude Scale

Magnitude Level	Category	Effects
less than 1.0 to 2.9	micro	generally not felt by people, though recorded on local instruments
3.0–3.9	minor	felt by many people; no damage
4.0–4.9	light	felt by all; minor breakage of objects
5.0–5.9	moderate	some damage to weak structures
6.0–6.9	strong	moderate damage in populated areas
7.0–7.9	major	serious damage over large areas; loss of life
8.0 and higher	great	severe destruction and loss of life over large areas

11.5.12 Hydrological

In relation to natural hazards, the current and evolving climate system in Scotland poses a risk to infrastructure and developments. The Climate Change Act (2008) is central to the UK Government's plan to reduce carbon emissions. The Act is a legally binding target to reduce the UK's GHG emissions by a reduction of 80% against 1990 levels by 2050. In May 2019, the UK Government declared a climate emergency, leading to updating the commitments in the 2008 Act to target net zero carbon emissions by 2050 under the Climate Change Act (2050 Target Amendment) Order 2019.

Tidal Levels

The closest tide table port to the site is at Millport, Great Cumbrae, <3km from the quay. The astronomical tidal range for Millport is shown in Table 11-12, where the highest astronomical tide is 3.9m CD which is equivalent to 2.3mAOD.

Table 11-12: Tidal range at Millport

Tide condition	Chart Datum (mCD)*	Ordnance Datum (mAOD)**
Highest Astronomical Tide	3.9	2.3
Mean High Water Spring	3.4	1.78
Mean High Water Neap	2.7	1.08
Mean Level	1.99	-0.26
Mean Low Water Neap	1.0	-0.62
Mean Low Water Spring	0.4	-1.22
Chart Datum	0	-1.62

** Admiralty Tide Tables*
*** Chart Datum correction for Ordnance Datum is -1.62m (relative to OD at Newlyn)*

Extreme water levels

The lower lying internal area of the HCY is shown on the SEPA indicative flood map as being at risk of flooding from the sea. SEPA's Extreme Sea Level datasets for Scotland indicate the 1 in 200 year and 1 in 1,000 year return period extreme still water level for Hunterston Construction Yard is 3.67mAOD and 4.03mAOD respectively, with a confidence interval of 0.5m and 0.7m respectively.

Wave Climate

A spectral wave modelling study previously undertaken (EnviroCentre, 2019) highlights that offshore of the construction yard, towards the Hunterston channel, the highest significant wave heights can be expected to occur during wind from the 240° sector, with wind from the 270° sector also producing similar wave heights. In this area modelled 5-year return period (RP) significant wave heights range between 0.95 m and 1.40 m under wind forcing from the 240° sector, and between 0.95 m and 1.25 m under wind forcing from the 270° sector. In the vicinity of the jetty and the adjacent SSSI, modelled 5-year RP significant wave heights range between 0.60 m and 0.85 m under wind forcing from the 300° sector. Under mean wave and wind conditions significant wave heights towards Hunterston channel are predicted to be between 0.10 m and 0.25 m. For the same conditions, further east around the jetty and on Southannan Sands, predicted significant wave heights are less than 0.10 m..

Tidal Currents

Tidal currents in this area are generally slow, with mid depth velocities in the development site not expected to exceed 0.3m/s. Previous modelling studies have shown that current speeds vary locally from above 0.4 m/s in the deeper water of Hunterston Channel, to less than 0.05 m/s in the shallow margins of Southannan Sands. Wave action in shallow water (<10m) can generate strong flows during storm conditions or with an incoming swell. A combination of tidal currents and wave action will produce the highest energy conditions in the vicinity of the site, with the greatest potential for sediment transport (Ayrshire Power Limited, 2010; EnviroCentre, 2013 & 2019).

Future Climate: Tidal Water Levels

The UKCP18 future projections of relative sea-level rise have previously been obtained for Millport for the period 2007 to 2100 for the Representative Concentration Pathway (RCP) 8.5 scenario. The 95th percentile projections of sea level rise from 2007 to 2050 is +0.28 m, which are considered to provide an appropriate time period for the proposed works at Hunterston. The effect of this at Southannan Sands in terms of low water extents, would be to shift the Lowest Astronomical Tide extent landwards by between 4 – 125 m, and shift the mean low water spring tide extent landward by between 10 – 185 m. In terms of wider projections beyond this timescale, the projected sea level rise from 2007 to 2080 for this scenario is +0.62 m.

Wind

The UKCP18 wind speed analysis concludes that there are no compelling trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. The global projections over the UK show an increase wind speeds over the UK for the second half of the 21st century for the winter, associated with an increase in frequency of winter storms over the UK, while overall there is no trend in the wind speed over the UK.

Waves

The likely impact of climate change on wave height remains an area of significant uncertainty. The current SEPA climate change guidance (SEPA, 2023) does not provide recommended allowances. It is noted that the size of waves at the coast is often limited by depth of water, and therefore sea level is likely to have a greater impact on wave overtopping. The guidance recommends that wave model sensitivity to offshore wave height is tested through an increase of 10 – 20% in offshore wave height to account for changes as a result of climate change.

11.5.13 Meteorological

The development site is located within a relatively rural area influenced by maritime weather conditions, as a consequence, the Hunterston area does not suffer from the extremes of temperature. The hills to the east of Hunterston, provide a degree of shelter from strong winds from the east.

11.5.14 Traffic

The proposed development will utilise the existing road network during the construction phase, albeit most the material requires will be brought in via marine vessels. Construction related traffic will originate from the delivery of materials to site, removal of surplus excavated material from site and transport of employees to, from and throughout the site. The localised traffic disruptions will be mitigated through the use of industry standard traffic management measures.

11.5.15 Aircraft

There are no active airfields or airports within 15km of the site.

The Air Navigation (Restriction of Flying) (Nuclear Installations) Regulations impose restrictions on flying in the airspace in the vicinity of certain nuclear installations for reasons of public safety. This has been agreed by the Civil Aviation Authority and the Department for Transport.

(1) Restricted airspace

The Air Navigation (Restriction of Flying) (Nuclear Installations) Regulations 2016 imposes restricted airspace around nuclear installations including Hunterston i.e. two nautical miles from the centre of the nuclear facility which covers the proposed Hunterston Construction Yard (Table 11-11).

The relevant section of the regulations are noted below.

3.—(1) This regulation applies to each of the nuclear installations specified in Column 1 of the Schedule, each of which for the purpose of these Regulations comprises an area bounded by a circle of the radius specified in Column 2 of the Schedule, opposite its name in Column 1, and centred on the position specified in Column 3 of the Schedule.

(2) Subject to regulations 4 to 12, no aircraft is to fly over a nuclear installation to which these regulations apply below the height above mean sea level specified in Column 4 of the Schedule opposite its name in Column 1.

Permitted flight in restricted airspace

4.—(1) Regulation 3 does not prohibit a flight over a nuclear installation specified in paragraph (2) for the purpose of landing at, or taking off from, the helicopter landing area at the installation with the permission of the person in charge of the installation and in accordance with any conditions to which that permission is made subject.

(2) Paragraph (1) applies to the nuclear installations at Barrow-in-Furness, Berkeley, Burghfield, Dungeness, Hartlepool, Heysham, Hunterston, Hinkley Point, Oldbury, Sellafield, Sizewell, Torness and Wylfa.

Note: Restricted airspace at Hunterston is a radius of two nautical miles. The position of the 'centre of circle' as noted within the Schedule is 554317N 0045338W)

The airspace above nuclear power stations is restricted air space under 2000 feet.

(2) Flight Paths

Flight is permitted for the purpose of landing at or taking off from the helicopter landing area at Hunterston, with the permission of the person in charge of the installation and in accordance with any conditions to which that permission is subject.

Based upon the above, it can be concluded that the proposed development at Hunterston Construction Yard would unlikely infringe the horizontal flight path of aircraft.

Table 11-13: SCHEDULE Regulation 3(1)

Name of Nuclear Establishment	Radius in nautical miles	Position (centre of circle)	Height in feet above mean sea level
Aldermaston	1.5	512203N 0010847W	2400
Barrow-in-Furness	0.5	540635N 0031410W	2000
Berkeley	2	514134N 0022936W	2000
Burghfield	1	512424N 0010125W	2400
Capenhurst	2	531550N 0025708W	2200
Coulport/Faslane	2	560331N 0045159W	2200
Devonport	1	502317N 0041114W	2000
Dounreay	2	583435N 0034434W	2100
Dungeness	2	505449N 0005717E	2000
Hartlepool	2	543807N 0011049W	2000

Heysham	2	540147N	0025452W	2000
Hinkley Point	2	511233N	0030749W	2000
Hunterston	**2**	**554317N**	**0045338W**	**2000**
Oldbury	2	513852N	0023415W	2000
Rosyth	0.5	560147N	0032703W	2000
Sellafield	2	542505N	0032944W	2000
Sizewell	2	521250N	0013707E	2000
Springfields	2	534634N	0024815W	2100
Torness	2	555806N	0022431W	2100
Wylfa	2	532458N	0042852W	2100

In relation to regulation 3(2), the term 'aircraft' includes aircraft as classified by Part 1 of Schedule 4 to the Air Navigation Order 2016. It also includes, by virtue of article 23 of that Order, any small balloon, any kite weighing not more than two kilograms, any small unmanned aircraft and any parachute including a parascending parachute.

11.6 Impact Assessment

Table 11-14:Hazard Types

Natural Hazards			
Category	**Type**	**Subtype**	**Relevance to the Proposed Development**
Meteorological	Storm / Gale Both coastal and inland areas can be affected by high winds		• Poor Working conditions • Loss of infrastructure • Flooding • Falling Trees/ structures
	Heavy Snow	Blizzards- Poor visibility	Poor Working conditions
	Severe Cold / Frost extremes of Temperature	• Icy surfaces / Impassable Roads • Hypothermia • Freezing of Supply Network	• Poor Working Conditions • Workers Health Risk • Lack of Grit
	• Thunder & Lightening • Dense/ Persistent Fog • Heat Wave /Drought	Sea vessel and road traffic Collisions	• Loss of Infrastructure • Poor sailing/driving conditions. • Health Risk • Water Shortage
Hydrological	Flooding	Coastal / Inland	Potential for coastal flooding on-site
	Heavy Rain		May lead to flooding in low lying areas or areas with poor drainage.
Geology/Land	Ground Instability	Localised collapse	Localised collapse and subsidence of ground at the surface /surface settlement could lead to uncontrolled movement affecting objects /people / materials plant equipment which could cause injury fatality to persons on site and /or lead to secondary impacts e.g. damage to utilities leading to explosion.
	Structural Collapse / Accidental Impact		Collapse of new and existing buildings, structures and excavations via accidental impact with vehicles or via other failure mechanism. Other hazards associated with construction traffic movements on site include accidental impact to workers.
Transportation Hazards			
Category	**Type**	**Subtype**	**Relevance to the Proposed Development**
Aviation	Aircraft Collision /Loss	Mid Air and Land	Aircraft crash
Road	Road Traffic Collision		Public Roads via which construction staff and materials access/egress the site.
	Hazardous Material		Fuel/Oil Transport to/from site
	Bridge		Bridge strike
Water	Coastal	Vessel Interaction with Dredger / Collisions	Pollution/ crew injury and/or fatality
Technological Hazards			
Category	**Type**	**Subtype**	**Relevance to the Proposed Development**
Industrial Accidents	Explosions		Damage to Infrastructure Personal Injuries/ fatalities
	Petrochemical Fires		Personal Injuries, severe burns/ fatalities Air Pollution
	Industrial Fires	LPG Tank Fire	Not Applicable
	Gas Emission		Not Applicable
Explosions	Domestic		Not Applicable
	Bomb		Not Applicable
	LPG		Not Applicable
	Pipeline		Not Applicable
Fires			Air Pollution
Hazardous substance		Transportation accident	
	Biological	Leak	Damage to habitats and species.
	Radiological	Hunterston A and B	Damage to Infrastructure Personal Injuries/ fatalities, Habitats and Species
Pollution/ Contamination	Accidental release of pollutants into coastal water/ groundwater/ surface water due to construction activities		• Contamination of coastal water/groundwater. • Loss of water supply. • Contamination of land or sea habitats including designated sites, and impacts on dependent species leading to irreversible damage.

	Air/Water Pollution		Fire. Sediment-laden Water Run Off. Fuel/hydrocarbon spill/leak.
Civil Hazards			
Category	**Type**	**Subtype**	**Relevance to the Proposed Development**
Loss of Critical Infrastructure	Energy and Power Supply	Electricity	Connection to national grid
		Natural Gas	Not Applicable
		Fuel Oil	Storage on site
		Communications	Telecom operators, mobile phone networks
Epidemics and pandemic	Communicable diseases		Impact on human health
Terror	Bombs	Car-bombs	Not Applicable
		Bombs in buildings	Not Applicable
		Fire-bombing	Not Applicable
		UXB	Damage to Infrastructure Personal Injuries/ Fatalities

Table 11-15: Construction Stage

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
Potential Vulnerability to Accidents and / or Disasters								
1	Flooding of site, from coastal flooding, surface water, groundwater.	Extreme weather periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life; Sedimentation of nearby watercourse / coastal waters Damage to, or depletion of aquatic / marine habitats and species;	2	The consequences of flooding the proposed development site could include contamination with polluting substances, destabilising assets and compromising the integrity of plant and equipment. The proposed development will not increase flood risk off site during construction. Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding. Refer to findings of Chapter 9 Water Environment and Coastal Processes, prepared by EnviroCentre for the proposed development.	1	The risk of flooding during the construction phase will result in a minor consequence in that 'small number of people would be affected' should a severe weather occur, with 'no fatalities and a small number of minor injuries with first aid treatment' A system for monitoring flood warnings, and the development of a Flood Emergency Response Plan will be undertaken. Tolerable if ALARP	2
2	Severe Weather	Extreme weather periods of heavy rainfall, taking into account climate change and strong winds	Illness or loss of life; Sedimentation of nearby watercourse / coastal waters Damage to, or depletion of aquatic / marine habitats and species.	3	The UKCP18 wind speed analysis concludes that there are no compelling trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. The global projections over the UK show an increase wind speeds over the UK for the second half of the 21st century for the winter, associated with an increase in frequency of winter storms over the UK, while overall there is no trend in the wind speed over the UK.	1	The risk of severe weather conditions during the construction phase will result in a minor consequence in that 'small number of people would be affected' should a severe weather occur, with 'no fatalities and a small number of minor injuries with first aid treatment'. Tolerable if ALARP.	3
3	Earthquakes	Seismic damage to the site	Damage to utilities Damage to Structures Sedimentation of nearby watercourse / coastal waters Damage to, or depletion of aquatic / marine habitats and species.	2	As noted within Section 2.5.11 North Ayrshire has experienced a total of 66 earthquakes, within a 150 km radius since the1950's. All except two have been below magnitude 4. No earthquake has caused damage to the proposed development site or the adjacent Hunterston A and B nuclear power stations.	2	The risk from earthquakes is low. The highest magnitude earthquake since the 1950s has been magnitude 4 "*felt by all; minor breakage of objects*". Tolerable if ALARP	4
4	Fire / Explosion	Damage to adjoining facilities or as a result of adjoining facilities.	Illness or loss of life; Fuel spillage/storage and Electrical problems. Firewater run-off containing contaminants could be potentially harmful	2	In accordance with the Health & Safety Act, the development shall be subject to a fire safety risk assessment which would assist in the identification of any major risks of fire on site.	1	The construction phase of the proposed development will be carried out in accordance with all relevant environmental, health & safety guidance and legislation, as including the Construction (Design and Management) Regulations 2015. A CEMP will be in place to control potential environmental impacts of construction works. Control measures will be implemented to prevent fires and procedures will be prepared and implemented to respond to fires, in the event that they were to arise. Tolerable if ALARP	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
5	Ground Collapse	Risk of construction resulting in disturbance of manmade or naturally occurring ground related hazards. Vibration causes ground instability/ collapse/ settlement.	Localised collapse and subsidence of ground at the surface/ surface settlement could lead to uncontrolled movement affecting objects/ people/ materials/ plant/ equipment which could cause injury/ fatality to persons on site and/ or lead to secondary impacts e.g. damage to utilities leading to explosion.	1	Appropriate testing to understand the compressibility of deposits.	2	To reduce risks associated with ground instability, there will be use of industry standard construction methods/ design features appropriate to the context of the proposed development site. Tolerable if ALARP	2
6	Impact on Critical Utilities / Infrastructure	Damage to unmapped services / utilities during earth works.	Population Human Health Material Assets: Utilities	2	Works will be required both directly to and in the vicinity of existing utilities, in particular where underground electricity cables/ gas services may be encountered. Consultation with service providers has been ongoing and will continue throughout the design development.	1	Disruption to services are not considered to constitute a 'major accident or disaster' for the purposes of this assessment.	2
7	Major Construction Road Traffic Accident.	Potential major road traffic accident	Population Human Health Material Assets: Utilities	2	There is a risk from the proposed development to cause a major road traffic accident on haulage routes during the construction phase as a result of increased levels of construction traffic and HGVs on motorways, urban and rural roads. At this stage Abnormal Indivisible Loads (AIL) are not envisaged during construction, however, if it is determined necessary at a later date, an assessment of the proposed movement of vehicles with heavy, wide, long or/or high abnormal indivisible loads will be undertaken to determine the suitability of structures and roads (both trunk and non-trunk roads) to accommodate such vehicles.	1	The proposed development is not considered vulnerable to major construction road traffic accidents. The construction phase of the proposed development will be carried out in accordance with all relevant health and safety guidance and legislation. Refer to findings of Chapter 9 Traffic Assessment which indicates significance of potential impacts associated with transportation will be insignificant.	2
8	Contamination of coastal water/ groundwater / surface water.	Risk of contamination of water resources.	Irreversible damage to water resources and dependant species/ habitats.	2	Impact avoidance measures related to leaks and spills are presented in Chapter 9: Water Environment and Coastal Processes. Tolerable if ALARP	2	A CEMP will be implemented to manage storage of construction materials and potential environmental impacts of construction works, statutory requirements and identification of areas of highest sensitivity. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times.	4
9	Release of asbestos fibres to the atmosphere or surface water	Inadequate handling and removal of Asbestos Containing Materials (ACMs) during excavation works leading to short term exposure to construction personnel, and possibly members of the public in surrounding areas. Removal of un-surveyed ACM.	Risk of uncontrolled release of asbestos present on site, if disturbed during construction of the Proposed Development.	2	No demolition of structures containing asbestos is proposed as part of this development.	2	A watching brief will be adopted during the construction works and an asbestos management plan developed as part of the CEMP.	4
10	Incident at nearby Hunterston "A" site resulting in off-site environmental impact.	Fire / Explosion. Equipment / Infrastructure failure. Sedimentation of outfall.	Risk of fire/ explosion of equipment/ infrastructure failure at the site which can present a risk to the proposed development.	1	Liquid radioactive wastes from both power stations are/were discharged via one outfall into the Firth of Clyde. Chapter 9 Water Environment and Coastal Processes, prepared by EnviroCentre for the proposed development indicates the impact on the outfall will not be significant. Hunterston A is both highly regulated and monitored by the owners and regulated. Safety provisions are included in their procedures as noted within Sections 2.5.4 to 2.5.7.	5	In the event of an accident, the establishment will have an emergency response plan. The proposed development does not require any works within the establishment's boundary itself and does not have the potential to cause an accident at the establishment.	6

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					Gaseous radioactive wastes are discharged to the atmosphere via separate stacks, however, there is no known pathway associated with the proposed development which would impact emissions.			
11	Incident at nearby Hunterston "B" site resulting in off-site environmental impact.	Fire / Explosion. Equipment / Infrastructure failure. Sedimentation of outfall.	Risk of fire/ explosion of equipment/ infrastructure failure at the site which can present a risk to the proposed development.	1	Liquid radioactive wastes from both power stations are/were discharged via one outfall into the Firth of Clyde. Chapter 9 Water Environment and Coastal Processes, prepared by EnviroCentre for the proposed development indicates the impact on the outfall will be not be significant. Hunterston B is both highly regulated and monitored by the owners and regulated. Safety provisions are included in their procedures as noted within Sections 2.5.4 to 2.5.7. Gaseous radioactive wastes are discharged to the atmosphere via separate stacks, however, there is no known pathway associated with the 12proposed development which would impact emissions.	5	In the event of an accident, the establishment will have an emergency response plan. The proposed development does not require any works within the establishment's boundary itself and does not have the potential to cause an accident at the establishment.	6
12	Collision of Aircraft	Fire or explosion event impacting local population and/or the environment e.g. reduced driver visibility. Pollution event impacting local population and/ or the environment. Injury or death to site workers/ general public. Debris falling on the site/surroundings. Distracted drivers crashing.	Risk of collision between aircraft and tall construction machinery, e.g. cranes. Construction lighting and tall structures have the potential to present a visual distraction to pilots, causing aircraft incident. Potential risk of asset damage and subsequent fires/ explosions.	2	There are no active airfields or airports within 15km of the site. Hunterston Construction Yard is located within regulated restricted airspace associated with Hunterston A and B Nuclear facilities.	1	The CEMP will include vigilance and security systems to safely shutdown the proposed development in the event of any aircraft related incident.	2

Table 11-16: Operational Stage

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
Potential Vulnerability to Accidents and / or Disasters								
1	Flooding of site, from coastal flooding, surface water, groundwater.	The site is at risk of coastal and surface flooding. Proximity to coast. Extreme weather- periods of heavy rainfall, taking into account climate change, strong winds and tidal events	Worsened extreme weather impact leads to fatality/ injury to site operative and/ or in irreversible damage to environmental receptor (ecological site, watercourse etc.). The consequences of could include contamination with polluting substances, destabilising assets and compromising the integrity of plant and equipment.	2	There is considered to be risk to the Proposed Development from extreme flood events to causing accident or damage during the operational phase. The proposed development may to be vulnerable to flooding in the area. During a prolonged weather event or flood conditions, there is a potential risk to the safety of maintenance workers/ public. Chapter 9 includes recommendations for measures within the ongoing design of the proposed development to withstand predicted tidal impact.	2	The site is at risk of coastal and surface flooding. The proposed development will not increase flood risk off site during construction. Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding. Refer to findings of Chapter 9 Water Environment and Coastal Processes, prepared by EnviroCentre for the proposed development.	4
2	Storm / Gale	Both coastal and inland areas can be affected by high winds	The impact of climate change causing extremes of temperature and winds may affect process operation of the proposed development site such as structural stability. This could potentially impact the operation and efficiency of the proposed development.	2	With regard to extreme weather events such as severe snowfall, blizzard and hailstorm events or prolonged cold weather events, the proposed development will be designed to operate under a range of environmental conditions, in accordance with all relevant local authority and national standards. In addition, where weather emergencies are judged to impact public safety at national level the Met Office will issue advice. The design will incorporate future climate resilience measures, if required to ensure use of suitable materials in the design of utility systems such as cooling water. The measures included are sufficient to reduce the risks to appropriate levels for the nature of the Proposed Scheme.	2	The UKCP18 wind speed analysis concludes that there are no compelling trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. The global projections over the UK show an increase wind speeds over the UK for the second half of the 21st century for the winter, associated with an increase in frequency of winter storms over the UK, while overall there is no trend in the wind speed over the UK.	4
3	Earthquakes	Seismic damage to the site	Damage to utilities Damage to Structures Sedimentation of nearby watercourse / coastal waters Damage to, or depletion of aquatic / marine habitats and species.	2	As noted within Section 2.5.11 North Ayrshire has experienced a total of 66 earthquakes, within a 150 km radius since the1950's. All except two have been below magnitude 4. No earthquake has caused damage to the proposed development site or the adjacent Hunterston A and B nuclear power stations.	2	The risk from earthquakes is low. The highest magnitude earthquake since the 1950s has been magnitude 4 "*felt by all; minor breakage of objects*"	4
3	Fire / Explosion	Equipment or infrastructure failure. Act of terrorism. Electrical problems..	Irreversible damage to environmental receptor (ecological site, coastal waters/ watercourse etc.) depending on concentrations/ duration of release.	2	In accordance with the Health & Safety Act, the development shall be subject to a fire safety risk assessment which would assist in the identification of any major risks of fire on site.	1	The proposed development will be designed, built and operated in line with best international current practice, and will be compliant with all relevant Health and Safety and Fire regulation and guidance.	2
4	Contamination of coastal water/ groundwater / surface water.	Risk of contamination of water resources.	Irreversible damage to water resources and dependant species/ habitats.	2	Impact avoidance measures related to leaks and spills are presented in Chapter 9: Water Environment and Coastal Processes.	2	A Pollution Incident Response Plan will set out statutory requirements and identification of areas of highest sensitivity. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times. Once operational the site will be required to comply with all relevant legislation and regulations, which could include permits and licences to operate which includes monitoring and reporting to respective regulators. Tolerable if ALARP	4
5	Incident at nearby Hunterston "A" site	Fire / Explosion. Equipment / Infrastructure failure.	Risk of fire/ explosion of equipment/ infrastructure failure at the site which can present a risk to the proposed development.	1	Liquid radioactive wastes from both power stations are/were discharged via one outfall into the Firth of Clyde. Chapter 9 Water Environment and Coastal Processes, prepared by EnviroCentre for	5	In the event of an accident, the establishment will have an emergency response plan.	6

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
	resulting in off-site environmental impact.	• Sedimentation of outfall.			the proposed development indicates the impact on the outfall will not be significant. Hunterston A is both highly regulated and monitored by the owners and regulated. Safety provisions are included in their procedures as noted within Sections 2.5.4 to 2.5.7. Gaseous radioactive wastes are discharged to the atmosphere via separate stacks, however, there is no known pathway associated with the proposed development which would impact emissions.		The proposed development does not require any works within the establishment's boundary itself and does not have the potential to cause an accident at the establishment.	
6	Incident at nearby Hunterston "B" site resulting in off-site environmental impact.	Fire / Explosion. Equipment / Infrastructure failure. • Sedimentation of outfall.	Risk of fire/ explosion of equipment/ infrastructure failure at the site which can present a risk to the proposed development.	1	Liquid radioactive wastes from both power stations are/were discharged via one outfall into the Firth of Clyde. Chapter 9 Water Environment and Coastal Processes, prepared by EnviroCentre for the proposed development indicates the impact on the outfall will be not be significant. Hunterston B is both highly regulated and monitored by the owners and regulated. Safety provisions are included in their procedures as noted within Sections 2.5.4 to 2.5.7. Gaseous radioactive wastes are discharged to the atmosphere via separate stacks, however, there is no known pathway associated with the 12proposed development which would impact emissions.	5	In the event of an accident, the establishment will have an emergency response plan. The proposed development does not require any works within the establishment's boundary itself and does not have the potential to cause an accident at the establishment.	6
7	Collision of Aircraft	Fire or explosion event impacting local population and/or the environment e.g. reduced driver visibility. Pollution event impacting local population and/ or the environment. Injury or death to site workers/ general public. Debris falling on the site/surroundings. Distracted drivers crashing.	Risk of collision between aircraft and tall construction machinery, e.g. cranes. Construction lighting and tall structures have the potential to present a visual distraction to pilots, causing aircraft incident. Potential risk of asset damage and subsequent fires/ explosions.	2	There are no active airfields or airports within 15km of the site. Hunterston Construction Yard is located within regulated restricted airspace associated with Hunterston A and B Nuclear facilities.	1	Operational procedures will include vigilance and security systems to safely shutdown the facility in the event of any aircraft related incident.	2
8	Vehicle collisions on site	Operator negligence. Failure of vehicular operations. Acts of terrorism	Population Human Health Material Assets: Utilities	1	A limited number of vehicles will be permitted on the site as part of the operational phase. As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision to occur on site, 'at some time.' An unlikely risk is therefore predicted.	1	Access to Facilities operated by Peel Ports require reasonable justification to support access requests must be provided for all persons/vehicles at least 24 hours in advance of arrival. Private car use will be managed through operational management protocols. Further, individual accidents / incidents are not considered to constitute a 'major accident / disaster' for the purposes of this assessment.	1

The risk assessment for each of the potential risks identified are consolidated in Table 11-17 which provides their 'risk score.' A corresponding risk matrix is provided in Table 11-18, which is colour coded in order to provide an indication of the critical nature of each risk. As outlined in Section 11.4.1 the red zone represents 'high risk' scenarios', the amber zone represents 'medium risk scenarios and the green zone represents 'low risk scenarios.

Table 11-17: Risk Scores

Risk ID	Potential Risk	Likelihood Rating	Consequence Rating	Risk Score
Construction Phase				
1	Flooding of site, from coastal flooding, surface water, groundwater.	2	1	2
2	Severe Weather	3	1	3
3	Earthquakes	2	2	4
4	Fire / Explosion	2	1	2
5	Ground Collapse	1	2	2
6	Impact on Critical Utilities / Infrastructure	2	1	2
7	Major Construction Road Traffic Accident.	2	1	2
8	Contamination of coastal water/ groundwater / surface water.	2	2	4
9	Release of asbestos fibres to the atmosphere or surface water	2	2	4
10	Incident at nearby Hunterston “A” site resulting in off-site environmental impact.	1	5	6
11	Incident at nearby Hunterston “B” site resulting in off-site environmental impact.	1	5	6
12	Collision of Aircraft	2	1	2
Operational Phase				
13	Flooding of site, from coastal flooding, surface water, groundwater.	2	2	4
14	Storm / Gale	2	2	4
15	Earthquakes	2	2	4
16	Fire / Explosion	2	1	2
17	Contamination of coastal water/ groundwater / surface water.	2	2	4
18	Incident at nearby Hunterston “A” site resulting in off-site environmental impact.	1	5	6
19	Incident at nearby Hunterston “B” site resulting in off-site environmental impact.	1	5	6
20	Collision of Aircraft	2	1	2
21	Vehicle collisions on site	1	1	1

Table 11-18, presents the potential risks identified during the construction and operation of the proposed development all or which can be classified as ‘low risk scenarios.’

Table 11-18: Risk Matrix

Likelihood	Consequence Rating				
5. V. Likely					
4. Likely					
3. Unlikely	2,				
2. V. Unlikely	1,4,5,6,7,12,16,20	3,8,9,	10,11,18,19		
1. Ext. Unlikely	21				13,14,15,17
	1.Minor	**2. Limited**	**3. Moderate**	**4. Significant**	**5. Catastrophic**

11.6.1 Decommissioning

For a development of this type, decommissioning is not envisaged. Should decommissioning ever be planned in the future Statutory Regulators would be consulted and applications made at that time under whatever future regulatory regime exists at that point in the future.

11.6.2 Do-Nothing Impact

In the event that the proposed development does not proceed, the site would remain in its current undeveloped, state. In absence of an increased number of people residing, working or visiting the site, there would be no increase in the risk of major accidents occurring due to human interaction, should a disaster take place.

11.6.3 Construction Stage

None of the potential risks to be noted during the construction phase were identified as requiring further assessment.

11.6.4 Operational stage

None of the potential risks to be noted during the operational phase were identified as requiring further assessment.

11.7 Mitigation and Monitoring

11.7.1 Construction Phase

The mitigation measures relevant to each environmental factor outlined in chapters 5 – 12 of the EIAR, as well as in the Schedule of Mitigation, will be implemented during the construction phase of the development and will collectively mitigate the risk of major accidents and disasters during this time. In addition, The Construction (Design and Management) Regulations (CDM Regulations) will ensure that health and safety issues are properly considered during a project’s development, with a strong focus on managing risks and ensuring health and safety. The CDM Regulations include every aspect of the construction process, from the initial concept, design, and planning to the construction, maintenance, and eventual demolition or decommissioning of a structure.

The construction phase of the proposed development will be carried out in accordance with best practice site management measures relating to environmental, health and safety and emergency response. These measures will be described in the Construction Environmental Management Plan (CEMP).

The works programme for the construction stage of the development will take account of weather forecasts and work will be suspended in the case of extreme weather events.

The following forecasting and weather warning systems are available and will be used on a daily basis at the site to direct proposed construction activities:

- General Forecasts: Available on a national, regional, and county level from the Met Office website (https://www.metoffice.gov.uk/). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- The Met Office operates 24 hours a day, 365 days a year so warnings can be issued at any time, day or night.
- The Met Office provides warnings up to seven days ahead for rain, thunderstorms, wind, snow, lightning, ice, extreme heat and fog. Each warning will contain the following sections:
    - Headline – a short weather headline, which states what weather type, is forecast
    - What to expect – details on the types of impact forecast and an indication of how likely those impacts are
    - What should I do – this section links to advice and guidance from our partners on how to stay safe in severe weather
    - Further details – additional information on the forecast weather.

The three warning categories are:

- **Yellow**: Not unusual weather. Localised danger.
- **Amber**: Infrequent. Increased likelihood of impacts from severe weather.
- **Red**: Rare. Dangerous/destructive.

Met Office App and website: Alerts to the possible occurrence of severe weather coverage from 1 hour to 7 days ahead;

Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;

Rainfall Radar Maps: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The rainfall radar map shows precipitation and rainfall rates across the UK. Includes forecasts up **to 5 days** and observations from the last 48 hours.; and,

Consultancy Service: The Met Office provide a consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

11.7.2 Operational Stage

Standard operational procedures and protocols will be implemented to reduce the risk of major accident / disaster during operation. In addition, it is anticipated that site will be covered by various permits and licences such as Pollution Prevention and Control permits, Car Licence (under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) etc. which will require routine monitoring and reporting to the appropriate statutory regulator.

11.8 Residual Effects

The risk of a major accident and/or disaster during the construction phase of the proposed development is considered low.

The risk of a major accident and/or disaster during the operational phase of the proposed development is considered low.

11.9 Statement of Significance

On the basis of the assessment, adoption of the proposed mitigation approaches throughout this EIAR and adherence to best working practices during construction and operation of the site, there is not considered to be significant impacts associated with Accidents and Natural Disasters.

12 NAVIGATION

12.1 Introduction

This chapter provides an assessment of the potential impacts of the proposed development on commercial and recreational navigation. The principal marine elements of the proposed development are shown in Chapter 2 of this Environmental Impact Assessment Report (EIAR).

With regard to the marine operations the proposed development and its ongoing operations will take place within Clydeport's Statutory Harbour Authority (SHA) area. Clydeport as harbour authority, is owned and operated by Peel Ports Group (PePG) Limited. This make Clydeport the harbour authority for marine operations and means they must assure themselves that the marine hazards associated with the proposed development are appropriately managed. In addition to this chapter, which considers the conservation of safe navigation from an EIAR perspective, a Navigational Risk Assessment (NRA) has also been prepared (Technical Appendix 12.1) to determine the risk and potential appropriate mitigation measures for consideration and implementation by the SHA.

12.2 Scoping and Consultation

Table 12-1: Scoping Opinion on Navigation

Authority	Scoping Opinion	Technical Discipline Response
Marine Directorate	*"The Scottish Ministers note the Applicant's intention to focus the EIA Report on only the construction phase of the Proposed Works. Responses received from NatureScot, Maritime and Coastguard Agency, Royal Yachting Association Scotland and Transport Scotland, as provided in Appendix I of this Scoping Opinion, advise that the post-construction and operational phases of the Proposed Works must also be included in assessments".* "The Applicant identifies the potential impacts of traffic, shipping, and navigation in **Section 12 of the Scoping Report**. The Applicant identifies potential significant effects in Section 12.3 and receptors that are proposed to be scoped in and out in Section 12.4. This Scoping Opinion will only address aspects below MHWS. However, the Scottish Ministers advise that all transport concerns must be addressed to the satisfaction of the consultees in the EIA Report."	The EIAR and the technical appendices both cover the construction and operational phases of the proposed works. It is identified within these sections that the Harbour Authority 'Clydeport Operations Limited' is the statutory harbour authority for the area up to MHWS and must assure themselves that the marine aspects of the work are completed safely and appropriately managed. To enable Clydeport to make this determination as to whether navigation risk and conservancy of safe navigation can continue to occur, this section of the EIAR and the associated Technical Appendix (2.2) provides appropriate detail to enable effective decision making when determining if matters of marine safety are mitigated currently, and if not, how to mitigate them further.
M&CA	*"The applicant has stated that a suitable Navigation Risk Assessment (NRA) will be undertaken with respect to proposed development. This will be produced in line with Clydeport Operations Ltd Marine Navigational safety policy. The M&CA would expect the NRA to be updated in accordance with the Port Marine Safety Code (PMSC) and its associated Guide to Good Practice. To ensure local stakeholder input, the M&CA would recommend a hazard identification workshop be held, to bring together relevant navigational stakeholders for the area to discuss the potential impacts on navigational safety during the construction and operational phase. Decisions relating to further controls should be agreed in consultation with other interested parties to determine whether the ALARP status has been met for each risk. The outputs of the NRA should be used to inform a judgement on significance of effects arising from the Project.* *Finally, to address the ongoing safe operation of the marine interface for this project, the M&CA would like to point the applicant in the direction of the Port Marine Safety Code (PMSC) and its Guide to Good Practice. They will need to develop a robust Safety Management System (SMS) for the project under this code. From the Guide to Good Practice, section 7 Conservancy, a Harbour Authority has a duty to conserve the harbour so that it is fit for use as a port. The harbour authority also has a duty of reasonable care to see that the harbour is in a fit condition for a vessel to be able to use it safely. Section 7.8 Regulating harbour works covers this in more detail."*	An NRA has been undertaken and forms Technical Appendix 12.1 of this EIAR. The NRA has followed the Port Marine Safety Code (PMSC) (DfT, 2016) and its Guide to Good Practice (GtGP) (DfT, 2018) on the methodology within the NRA as well as adhering to Peel Ports Group Marine Safety Management System, as the Harbour Authority and competent authority for marine safety in the area that the proposed development is located. To inform the NRA a Hazard Identification Workshop was undertaken that included local stakeholders to comment and suggest potential hazards and mitigations for the proposed development. The NRA will be utilised by the Statutory Harbour Authority in order to inform their risk assessments for both the construction and operation of the proposed development. This EIAR section focus on conserving the safe navigation environment and ensuring that the SHA continues to operate in a fit condition throughout the construction and operation of the proposed development.
RYA Scotland	*"RYA Scotland and broadly agree that recreational boating can be scoped out of the EIA. However, the report provides no evidence to support this. The 730 berth Largs Marina is only 4 km away from the development and Fairlie Quay with its moorings is even nearer. This is in one of the busiest areas in Scotland for recreational boating and it was surprising not to see this mentioned. It was also surprising to see that it is proposed to scope out shipping and navigation in advance of undertaking a Navigational Risk Assessment. Peel Ports Clydeport works well with recreational users of these waters and publish, for example, the Clyde Leisure Navigation Guide, now in its fifth edition. The existing NRA should have been reviewed to see if the development poses any new hazards, which seems unlikely".*	An NRA has been produced and is a Technical Appendix 12.1 that provides context on the risk to commercial and recreational navigation in support of this section of the EIAR. To facilitate this NRA a Hazard Identification (HAZID) workshop was held in Hunterston and was attended by representatives of the harbour authority, the local council, nearby marinas and a member of RYA Scotland. The risk outcomes, causes and controls, cited in the NRA were drawn from the stakeholders who attended the HAZID workshop. Particular care was made to ensure that the Clyde Leisure Navigation Guide was cited as a control in the HAZID, along with other measures to support recreational vessel operators such as education, regular engagement, and familiarisation.

12.3 Policy, Legislation and Guidance

12.3.1 National Legislation and Policy

Marine (Scotland) Act 2010: The act defines the requirement for marine licences in Scottish waters which includes the "construction of any works in or over the sea, and on or under the seabed" and the carrying "out of any form of dredging within the Scottish marine area (whether or not involving the removal of any material from the sea or sea bed)". The application for a licence must have regard to the need to protect the environment, protect human health, prevent interference with legitimate uses of the sea and other matters considered relevant by Scottish Ministers.

The Marine Policy Statement (MPS), adopted across all UK administrations in March 2011, is designed to provide a comprehensive policy framework for the preparation of marine plans, aimed at enabling sustainable development within marine areas. The MPS envisions achieving clean, healthy, safe, productive, and biologically diverse oceans and seas. This vision is supported through the development of Marine Plans that incorporate a balance of environmental, social, and economic considerations. Specifically, the MPS emphasizes the importance of minimizing negative impacts on shipping activities, freedom of navigation, and navigational safety, ensuring that decisions comply with international maritime law. It also addresses environmental concerns related to shipping, highlighting issues such as accidental pollution, pollution from unlawful operations, and physical damages caused by collisions. The MPS guides marine plan authorities and decision-makers in making informed decisions that align with these overarching goals and legal frameworks.

Scotland's National Marine Plan acknowledges the importance of both commercial and recreational navigation, highlighting a strategic approach that balances economic activity with environmental stewardship. The plan prioritises navigational safety and supports the implementation of best practices to manage the activities that could impact the safety and efficiency of navigation channels. It adheres to international standards and promotes the adoption of new technologies that enhance navigation safety without compromising the marine environment. In addition to safety, the plan highlights the economic significance of marine navigation, encouraging sustainable development within these sectors to contribute to Scotland's economic health. It advocates for an integrated management approach to ensure that commercial and recreational navigation activities are harmonised with other marine uses and environmental objectives. Measures to minimise environmental impacts, such as pollution prevention and the mitigation of physical damage from vessels, are key components of the strategy, reflecting Scotland's commitment to protecting its marine resources while fostering economic growth.

The Pilotage Act (UK Public General Acts, 1987) requires CHAs to keep under consideration the pilotage services that may be required to secure the safety of ships. This Act gives a CHA the powers to make pilotage compulsory within their pilotage district and levy charges for the use of a pilot, grant pilotage exemption certificates and authorise pilots within their district. The Act also requires the Secretary of State to maintain a list of CHAs and empowers the Secretary of State to authorise other bodies to grant deep sea pilotage certificates in respect of such part of the sea falling outside the harbour of any CHA.

12.3.2 Local Legislation and Policy

Clyde Regional Marine Plan creates a framework for integrated, sustainable and co-ordinated planning and management of the Clyde Marine Region's environmental, economic and community resource. The policy relevant to this chapter is "Policy SEC 1": Applications for development(s) and/or activities will be supported where the proposal can demonstrate that:

- They will not have any adverse impacts on the efficient and safe movement or navigation of vessels to and from ports, harbours, marinas, moorings and anchorages, including ferry operations; and
- Access to the shore and water is optimised for sport, recreation and tourism, where possible, including, but not limited to piers, jetties, slipways, moorings, anchorages and navigational.

Clydeport ("the port") is classed as a Private Port (the statutory harbour authority is a company rather than a Trust Port or Local Authority Port). The Company, as the Statutory Harbour Authority is governed by its own local legislation collectively known as the Clydeport Acts and Orders 1858 to 2021 These local acts and order, collectively, provide Clydeport with duties, powers and responsibilities for operating a safe and efficient port marine operation.

12.3.3 Guidance

The UK national standard for safe and efficient port and maritime facility operation is the Department for Transport's '**Port Marine Safety Code'** (PMSC) (DfT, 2016) and its accompanying guidance document '**A Guide to Good Practice on Port Marine Operations' (GtGP)** on which this NRA methodology is based (DfT, 2018).

Additionally, principles from the **International Maritime Organization (IMO) Revised Guidelines for Formal Safety Assessment (FSA)** for use in the IMO rule making process (IMO, 2018) have been considered as it provides supplementary information with regard to navigational risk. It should be noted that this document covers a range of guidance for marine activities, not all of which are applicable or carried across to the port marine context in the UK.

12.4 Methodology

12.4.1 Determining significance of effects

The methodology used in this chapter to determine the significance of effect draws upon the methodology employed in the NRA (Technical Appendix 12.1). The method for carrying out the NRA follows the guidance from the Port Marine Safety Code (PMSC) 'A Guide to Good Practice on Port Marine Operations' (DfT, 2018). Additionally, considerations from Peel Ports Group Marine Safety Management System (MSMS) and the International Maritime Organization (IMO) Formal Safety Assessment (FSA) (IMO, 2018) have been consulted for guidance on hazard categorisation and analysis stages. It should be noted that whilst this chapter of the environmental impact assessment report is informed by the NRA, the NRA itself provides greater granularity on the navigation risks associated with the proposed development.

Hazard: The IMO Guidelines for FSA defines a hazard as: *"A potential to threaten human life, health, property or the environment",* (IMO, 2018). The first stage in the assessment was the identification of hazards arising from the proposed HCY development, termed the 'Hazard Identification' (HAZID). This exercise included holding a HAZID workshop (11 April 2024) with varied users of the port area such as pilots and, tug operators, and recreational navigation representatives. Subject matter experts and local port users in attendance at the HAZID workshop also contributed to the formation of the hazard scenarios with descriptive 'worst credible' and 'most likely' events.

Risk: The HAZID workshop, conducted for the NRA in compliance with the PMSC involved analysing each hazard scenario (both the 'most likely' and the 'worst credible') by determining a perceived consequence and likelihood, based on the judgement of those in attendance as subject matter experts. This combination of consequence and likelihood in consideration of a hazard is termed 'risk' or 'risk outcome(s)'. The analysis of each hazard scenario is completed against four receptors, namely:

- People (human life);
- Environment;
- Assets; and
- Reputation.

Consequence and Likelihood descriptors: Consequence and likelihood descriptors are used to inform the assignment of values to the hazard scenarios. These were drawn from the PePG MSMS as they represent the values

assigned to navigational and marine risk by the SHA. The descriptors detailed below in Table 12-2 ensure that outcomes are applied consistently in contemplation of the severity of the consequence.

Table 12-2: Consequence Descriptors

Descriptor	Score
Consequence Descriptors: People	
Near-miss, no injury, no treatment required, or; minor injury, may require first aid, but no time lost from work.	Low (1)
Non-reportable lost time injury (between 1 and 6 days lost from work), minor short term health problems.	Minor (2)
Reportable lost time injury, medical treatment by a doctor, paramedic or hospital, mid-term health problems.	Moderate (3)
Major injury (MAIB) or injury leading to disability, long term ability to work. Major long term or permanent health problems.	Major (4)
Loss of life (IMO). Fatality or multiple fatalities or total disability. Acute or developing terminal illness.	Catastrophic (5)
Consequence Descriptors: Environment	
Small area of sheen <10msq. Small gas release. No clean up required. No action by workforce.	Low (1)
Area of metallic appearance <50msq. Tier 2 responders called or dealt with by Tier 1 equipment on site. Terminal workforce in containment area onsite.	Minor (2)
Discontinuous true colour >50msq. Tier 2 called out. Terminal workforce in containment area offsite.	Moderate (3)
Serious pollution (IMO). Tier 2 responders called out. Local evacuation.	Major (4)
Severe pollution (IMO). Tier 3 responders called out. Large scale evacuation. Activation of National Contingency Plan.	Catastrophic (5)
Consequence Descriptors: Assets	
Cosmetic damage. Vessel drags anchor but is under control. Vessel sustains major system failure (engines etc.)	Low (1)
Loss of timbers from fendering. Bent ladders, coping stones cracked. Bent rails. Denting to hull.	Minor (2)
Bollards broken. Restricted use of berth. Mooring line part. Tow lines part. Vessel grounds, in collision, or floods. Minor damage to hull, cargo gear or accommodation. Temporary restricted use of navigational channel(s). Vessel fails to respond to VTS instructions.	Moderate (3)
Fender system compromised & requires repair before use. Pipeline damage. Structural damage rendering ship unseaworthy (IMO). Prolonged restricted use of navigational channel(s). Break-down requires towage. V/I drags anchor over pipeline.	Major (4)
Berth closed for rebuild. Navigational channel(s) closed for ongoing restricted use. Pipeline breach. Total loss of vessel. Vessel sunk on berth.	Catastrophic (5)
Consequence Descriptors: Reputation (Port)	
Accident closes port or part of the port for up to 1 hour. Vessel(s) delayed for a period up to 6 hours. Accident results in small item on local news. Social media interest. Improvement notice.	Low (1)
Accident closes port or part of the port for up to 3 hours. Vessel(s) delayed for a period up to 18 hours. Regional news with press statement required. Social media interest. Prohibition notice or injunction.	Minor (2)
Accident closes port or part of the port for up to 6 hours. Vessel(s) delayed for up to 36 hours. National news, journalists attend. Interviews required. Prosecution with fine or sued by third party.	Moderate (3)
Accident closes port or part of a port for up to 24 hours. National and international media attend. Management of media required. 24-hour response may be required. Personnel charged, public enquiry, compensation claims exceeding £1 million.	Major (4)
Accident closes port for more than 24 hours. World agencies require 24 hour information for a prolonged period. Management of media required. Conviction. Compensation payment exceeding £2 million.	Catastrophic (5)

The likelihood descriptors are used to inform the assignment of likelihood values to the hazard scenarios within the Hazard Log. The associated descriptors detailed in Table 12-3 ensure that values are applied consistently.

Table 12-3: Likelihood Descriptors

Descriptor	Years	Likelihood
This will probably never happen	1 per 50 years	Rare (1)
Do not expect it to happen/ recur but it is possible it may do so	1 per 25 years	Unlikely (2)
Might happen or recur occasionally	1 per 10 years	Possible (3)
Will probably happen/ recur but it is not a persisting issue	1 per 5 years	Likely (4)
Will undoubtedly happen/ recur, possibly frequently	>1 per year	Almost Certain (5)

The following risk matrix is used in conjunction with the aforementioned descriptors to assist in understanding the outcomes and how they relate to tolerability/acceptability.

Consequence / Likelihood	1 - Negligible	2 - Minor	3 - Moderate	4 - Major	5 - Catastrophic
5 - Almost Certain	5	10	15	20	25
4 - Likely	4	8	12	16	20
3 - Possible	3	6	9	12	15
2 - Unlikely	2	4	6	8	10
1 - Rare	1	2	3	4	5

Figure 12-1: Risk Matrix

The risk outcome for each of the four receptors is considered for the most likely and worst credible scenarios as described in the NRA Appendix. The overall risk classification, detailed in Table 12-4 below is based on the highest individual receptor for the most likely scenario and the highest individual risk outcome for the worst credible scenario being added together and then divided by two, before having the overall risk score then compared to the risk matrix again. For example; if the highest scoring receptor in the most likely scenario scored an '8' for a 'Likely' and 'Minor' incident and the highest scoring receptor for the worst credible scenario scored a 10 for an 'Catastrophic' and 'Unlikely' incident, they would be added to sum 18 and divided by 2 to result in a risk score of 9. This risk score falls in the yellow section and would therefore require review from the appropriate Head of Maritime (HOM), in this instance the HOM for Clydeport.

Table 12-4: Risk Classification

Classification	SAP Assessor
Green indicates that the risk score is acceptable and that the control measures can be inherently well implemented without onerous levels of intervention.	HOM
The risk score is acceptable provided that the port is content that procedures are in place to ensure that the control measures identified are implemented with suitable checks and verifications.	HOM

Classification	SAP Assessor
Amber may indicate that the risk score is ALARP but outside the boundaries of the port approving so must be authorised by the GHM.	GHM
The risk score is unacceptable and the hazard category or activity which generates the hazard should not be permitted or the control measures should be enhanced sufficiently to reduce the risk score.	Duty Holder

Within the context of this EIAR, the significance of these effects on receptors with respect to navigational risk are considered against the sensitivity categories within the Sensitivity of Receptors table (Table 12-5) of the Scoping Report from 'Negligible' to 'Very High', Table 12-5 presents this.

Table 12-5: Sensitivity of Receptors

Sensitivity	Definition	Risk Classification SAP Assessor
Very High	The significance of effects on the sensitivity of receptors is unacceptable and the hazard category or activity which generates the hazard should not be permitted or the control measures should be enhanced sufficiently to reduce the risk score.	Duty Holder
High	The significance of effects on the sensitivity of receptors may indicate that the risk is ALARP but outside the limit of an individual port to approve so must be authorised by the GHM.	GHM
Medium	The significance of effects on the sensitivity of receptors is acceptable provided that the individual port is content that the procedures in place ensure that control measures identified are implemented with suitable checks and verifications.	HOM
Low	The significance of effects on the sensitivity of receptors is acceptable and that the control measures can be inherently well implemented without onerous levels of intervention.	HOM
Negligible	The significance of effects on the sensitivity of receptors is negligible as no perceived risk exists	N/A

Sensitivity of Receptors is considered against the Magnitude of Impact in the Significance Matrix in the Traffic, Navigation and Shipping section of the scoping report. As such, an interpretation for the degree of change needs to be considered for navigation risk in the context of Magnitude of Impact descriptions. The following table (Table 12-6) considers description for the Magnitude of Impacts in the context of the degree of change to navigational risk.

Table 12-6: Magnitude of Impact

Magnitude of Impact	Definition
Major	Major change to risk score hazard category within Clydeport. This could include risks that increase in risk classification and are unacceptable regardless of the existing risks within the port.
Moderate	Moderate change to risk score per hazard category within Clydeport. This could include the introduction of risks within a risk category that exceeds the current highest risk already in place within the port whilst still being acceptable
Minor	Minor adverse change to risk score per hazard category within Clydeport. This could include the addition of a hazard that has a risk outcome in the same classification with a higher score.
Negligible	Negligible adverse change to risk receptors of navigational risk per hazard category or similar risk within Clydeport. This could include the addition of a hazard within the same risk classification at the same score of existing risks.
No change	No adverse change to risk score per hazard category within Clydeport. This could include the addition of a hazard that has a risk outcome in the same classification (or lower) with a lower score.

Table 12-7: Significance Matrix

		Magnitude of Impact				
		No Change	**Negligible**	**Minor**	**Moderate**	**Major**
Sensitivity	**Very High**	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

In the context of marine safety, it must be remembered that the overriding objective identified in the PMSC is to reduce risk to a point which is 'as low as reasonably practicable' (ALARP). Therefore, the methodology within this section of the EIAR will consider risk outcomes at the embedded controls state and at the future controls state so the appropriate authority can easily identify the perceived value added by introducing the future risk controls identified during the HAZID workshop associated with the NRA. Further details on these terms can be found within the NRA at Technical Appendix 12.1.

12.5 Baseline

12.5.1 The proposed Development

The development incorporates upgrading of the HCY into a harbour facility with a large working platform as specified within Chapter 2. To facilitate this development certain marine traffic operations will be incorporated into the construction and future use of the facility. The aspects which would affect marine navigation specifically would include the following:

- Delivery of goods: The delivery of goods for the proposed development primarily relates to the transportation and movement of construction materials. These materials are likely to be in relation to the quay wall and pilling infrastructure and may be transported to the Hunterston Terminal via barge or vessel.
- Dredge of area: The proposed development involves capital dredging of the quay approaches to increase the water depth and improve access. Dredging will extend to the -12m Admiralty Chart Datum (ACD) level contour from the constructed harbour wall, covering a substantial area depending on the quay wall configuration chosen (ranging from approximately 90,539 m² to 247,200 m² depending on the construction option). The dredged material may be used for infill purposes or disposed of at licensed disposal sites.
- Infill of dry dock: The infill of the existing dry dock involves removing its concrete base and filling it with dredged materials. This process requires about 1.3 million cubic meters of fill material, which may include material from the dredge of the quay area or other maintenance dredging activities within Clydeport's jurisdiction. The infill project includes reinforcement through vertical and horizontal structural elements, ensuring stability.
- Operation: Post-construction, the site is expected to operate as a port facility, initially focusing on offshore wind farm operations. As part of the operation of the site maintenance dredging will be undertaken.

12.5.2 Receptor Sensitivity

The receptors considered in this assessment include:

- **People:** Consequences to people from incidents in a port setting range from low impact events like near-misses or minor injuries requiring only first aid, to critical outcomes including severe long-term disability or the loss of life.
- **Environment:** Consequences from port incidents range from low impact, such as minor sheens or gas releases requiring no cleanup, to critical impacts involving severe pollution leading to large-scale evacuations and activation of national contingency plans.
- **Assets:** Consequences to infrastructure assets from incidents can range from cosmetic damages, such as minor dents to a vessel's hull, to severe impacts like total loss of a vessel or major structural damages that necessitate prolonged closures of navigational channels and extensive repairs or rebuilds of port facilities.
- **Reputation (Port):** Consequences to port reputation from incidents range from minor disruptions attracting local news attention and social media interest, to severe impacts such as prolonged closures over 24 hours with international media coverage, lead to significant legal actions, and necessitate multimillion-pound compensation claims.

12.5.3 Study Area

The HCY is located within Clydeport's SHA area which includes the Firth and River Clyde and the following sea lochs: Loch Fyne, Loch Riddon, Loch Striven, and the Holy Loch up to Mean High Water Spring Tide (MHWS). The landward limit of Clydeport's SHA area is the west side of Albert Bridge in the City of Glasgow. The seaward limits are identified by two lines drawn either side of the Isle of Arran. HCY is located in the Hunterston Channel to the East of Great Cumbrae Island and Little Cumbrae Island providing access for deeper draughted vessels to the Hunterston Ore and Coal Terminal. The study area for the purpose of the NRA includes the Hunterston Channel and Firth of Clyde Channel up to Gourock and including the approaches to Holy Loch and Loch Long in the north. In the south it includes the proposed dredge disposal sites in the Firth of Clyde (see Figure 12-2).

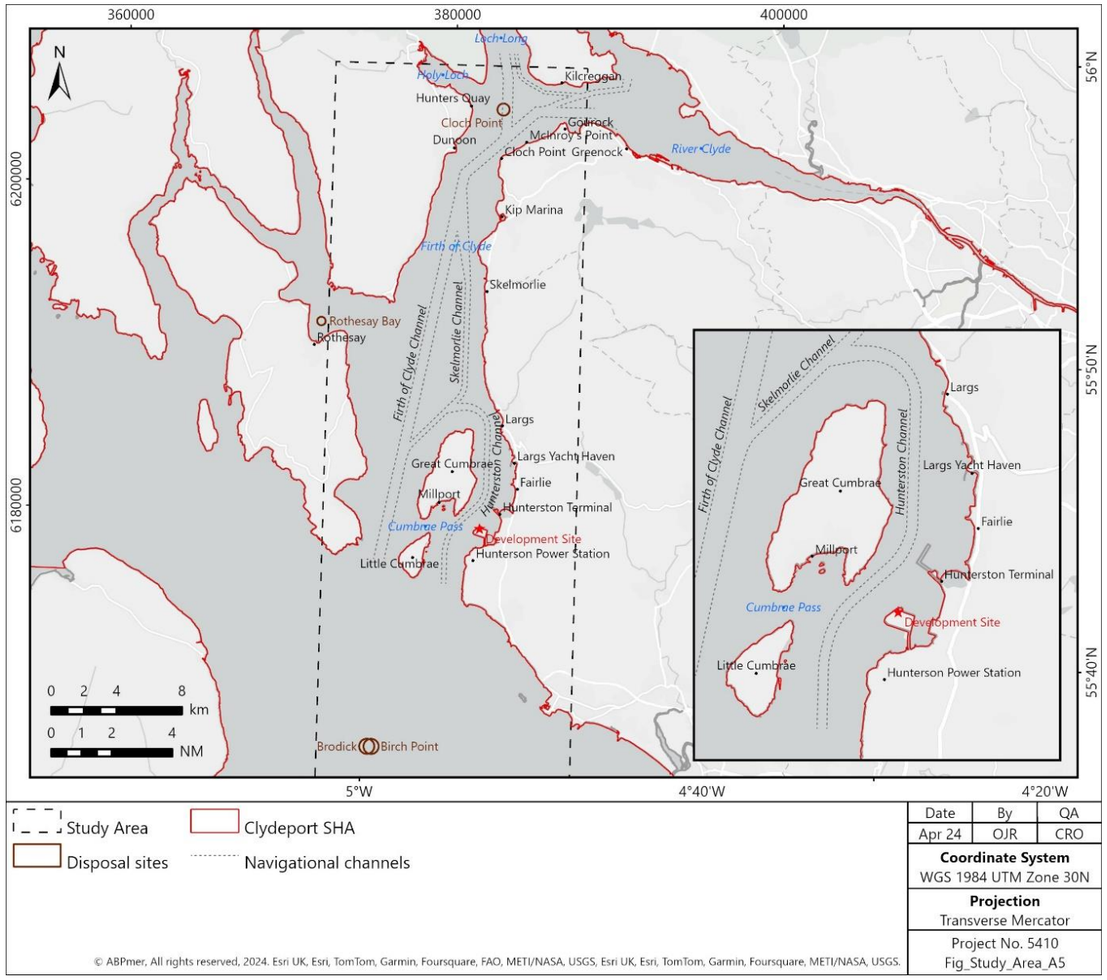


Figure 12-2: Study area

Within the Hunterston Channel there is a Nuclear Power plant to the south of HCY which is currently undergoing decommissioning and Hunterston Terminal to the north which is a PePG owned facility. Within the Hunterston Channel there are also two recreational facilities being Fairlie Quay and Largs Yacht Haven. The other large Marinas within the study area are Kip Marina which is located south of Cloch Point and Ardrossan located in the south. On Great Cumbrae Island there is a ferry terminal in the North and Millport town in the South. Routine passenger and vehicle ferries have scheduled routes crossing the study area at several locations.

12.5.4 Statutory Harbour Authority

Clydeport Operations Limited, owned by Peel Ports Group Limited (PePG), is the Statutory Harbour Authority (SHA) for an area of south-west Scotland covering some 450 square miles from the west side of Albert Bridge in Glasgow, down river along the tidal River Clyde covering all areas into the Firth of Clyde including Loch Fyne. Clydeport is the largest SHA by geographic area in the UK.

Clydeport is also the Competent Harbour Authority (CHA) within the meaning of the Pilotage Act 1987; the area of the CHA is exactly the same as the SHA area. Clydeport is the Local Lighthouse Authority (LLA) within the same area as its SHA, by virtue of Article 193 of the Merchant Shipping Act 1995; this gives Clydeport the duty to provide and maintain marking and lighting. PePG operates a Local Port Service (LPS) for the Clydeport SHA area, the service is operated from Liverpool at the Group Port Control Centre (GPCC). The LPS maintains a 24-hour 'watch and advisory' service on Very High Frequency (VHF) Channels 16 and 12. The service is provided with data from vessel Automatic Identification System (AIS) and Closed-Circuit Television (CCTV).

Clydeport as a CHA provide compulsory pilotage within their CHA Area this applies to the following vessels:

- Passenger vessels 25 m and over in length overall carrying in excess of 12 passengers. and any vessel carrying passengers when navigating East of No1 Buoy.
- Passenger vessels proceeding to Loch Fyne or the Kyles of Bute.
- Any Vessel carrying passengers when navigating East of No1 Buoy.
- Timetabled ferry services operating within the Authority's area of jurisdiction.
- Vessels carrying dangerous substances in bulk as defined in the Dangerous Substances in Harbour Areas Regulations 1987 and all vessels which are not gas free. Also:
- Regardless of the vessel's LOA, all vessels carrying IMDG Class I goods require Pilotage from the Cumbrae Heads Pilot Station to the berth and vice versa.
- Vessels carrying IMDG goods in bulk form require Pilotage from the Cumbrae Heads Pilot Station to the berth and vice versa.
- Vessels carrying IMDG goods containerised, other than IMDG Class 1, require Pilotage.

12.5.5 Marine Traffic

This NRA (Technical Appendix 12.1) has used Automatic Identification System (AIS) data to conduct a marine traffic analysis and to help determine any potential challenges that may arise due to marine traffic within the study area. The AIS data captures vessel movements within Clydeport's SHA across two separate periods to ensure coverage of both a quiet (winter) period and a busier (summer) period. The winter data was captured from 18th to 31st December 2023 which represents 14 days of continuous AIS coverage. The summer data was captured between 18th to 31st July 2023.

The data classifies vessels into ten categories which includes the following:

- Non-Port Service Craft,
- Port Service Craft,
- Dredging and Underwater Operations,
- High-speed craft,
- Military / Law Enforcement vessels,
- Passenger ships,
- Cargo ships,
- Tanker or bunker vessels,
- Fishing vessels, and
- Recreational craft.

Over the observed periods, a total of 8,135 vessel movements were recorded, with passenger ships and recreational craft showing the highest activity, particularly in the summer. This is largely due to the high ferry activity in the area crossing the Firth of Clyde and high recreational activity from Largs Yacht Haven and Kip Marina. These areas of high traffic volumes can be seen in Figure 12-3 and vessel transits by type can be seen in Figure 12-4.

The following sections summarise the movement of specific vessel types, the full analysis is illustrated in Technical Appendix 12.1.

Non-Port Service Craft: Include search and rescue craft. They typically follow similar navigational paths as Port Service Craft, covering significant areas like the Firth of Clyde Channel, Loch Long, and passing Greenock towards the River Clyde. Their activities are crucial for maintaining safety and providing assistance in maritime operations.

Port Service Craft: Consist of tugs, pilot boats, and other port work crafts essential for the day-to-day operations within ports. These vessels frequently transit through major channels such as Hunterston Channel, the Firth of Clyde Channel, and areas around Largs Yacht Haven. They play a pivotal role in guiding and assisting larger ships into and out of port areas.

Dredging and Underwater Operations: Vessels involved in dredging and underwater operations are specialised in seabed preparation and maintenance, ensuring navigational safety and operational efficiency within the Authority's jurisdiction. Within the observational period they are seen conducting movements mainly between Largs Yacht Haven and Millport.

High-Speed Craft: Within the observational period there was no recorded activity data for high-speed craft.

Military / Law Enforcement Vessels: Vessels are used for national defence, law enforcement, and security. Within the study area they have been observed navigating primarily from Largs Yacht Haven northwards, covering the Hunterston Channel and the wider Firth of Clyde.

Passenger Ships: Are primarily observed transiting ferry routes including connections from Largs to various destinations like Great Cumbrae Slip and Rothesay in the immediate vicinity of the proposed development as well as several different routes within the Firth of Clyde and are distinguished by the greater density areas intersecting the main channels.

Cargo Ships: Ships are primarily engaged in the transport of goods, navigating through channels to reach ports like Fairlie Quay and Hunterston Quay in proximity to the proposed development. Their routes also encompass traveling through the Firth of Clyde channel towards River Clyde and Rothesay.

Tanker or Bunker Vessels: Transport bulk liquids such as oil or chemicals. They regularly navigate through the Firth of Clyde Channel to the River Clyde or Loch Long, maintaining consistent routes in both winter and summer.

Fishing Vessels: Operate extensively around areas such as Largs, Rothesay, and Gourock. They are engaged in commercial fishing, navigating through various channels and dense fishing zones, especially active during summer with notable reductions in winter activity.

Recreational Craft: Include yachts and leisure boats predominantly active in summer, exploring regions like Rothesay, Kip Marina, Hunterston Channel, Great Cumbrae and Little Cumbrae. Recreational activities have been observed being considerably greater in the warmer months with significant drop-offs in winter, indicating seasonal usage patterns of water spaces for leisure purposes.

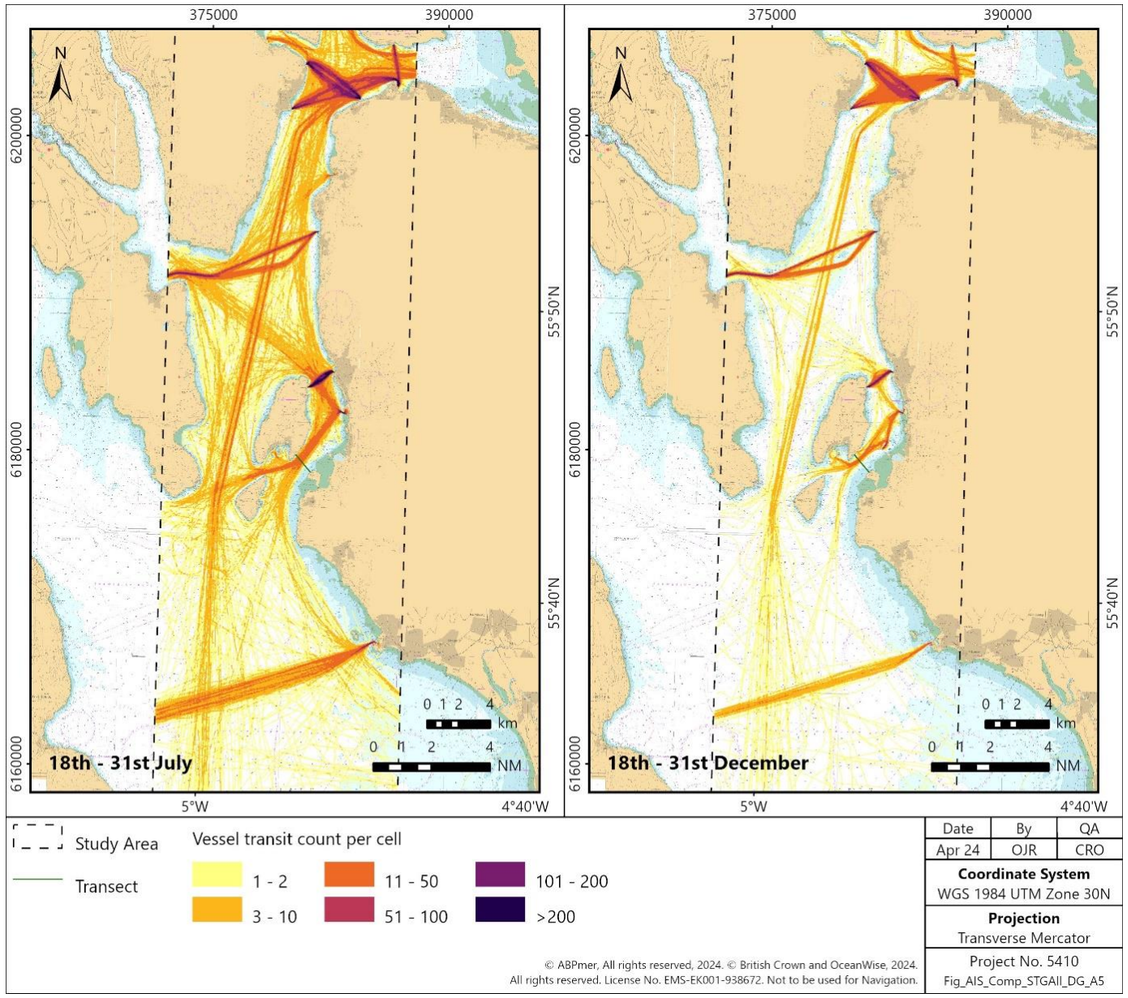


Figure 12-3: Vessel traffic Density

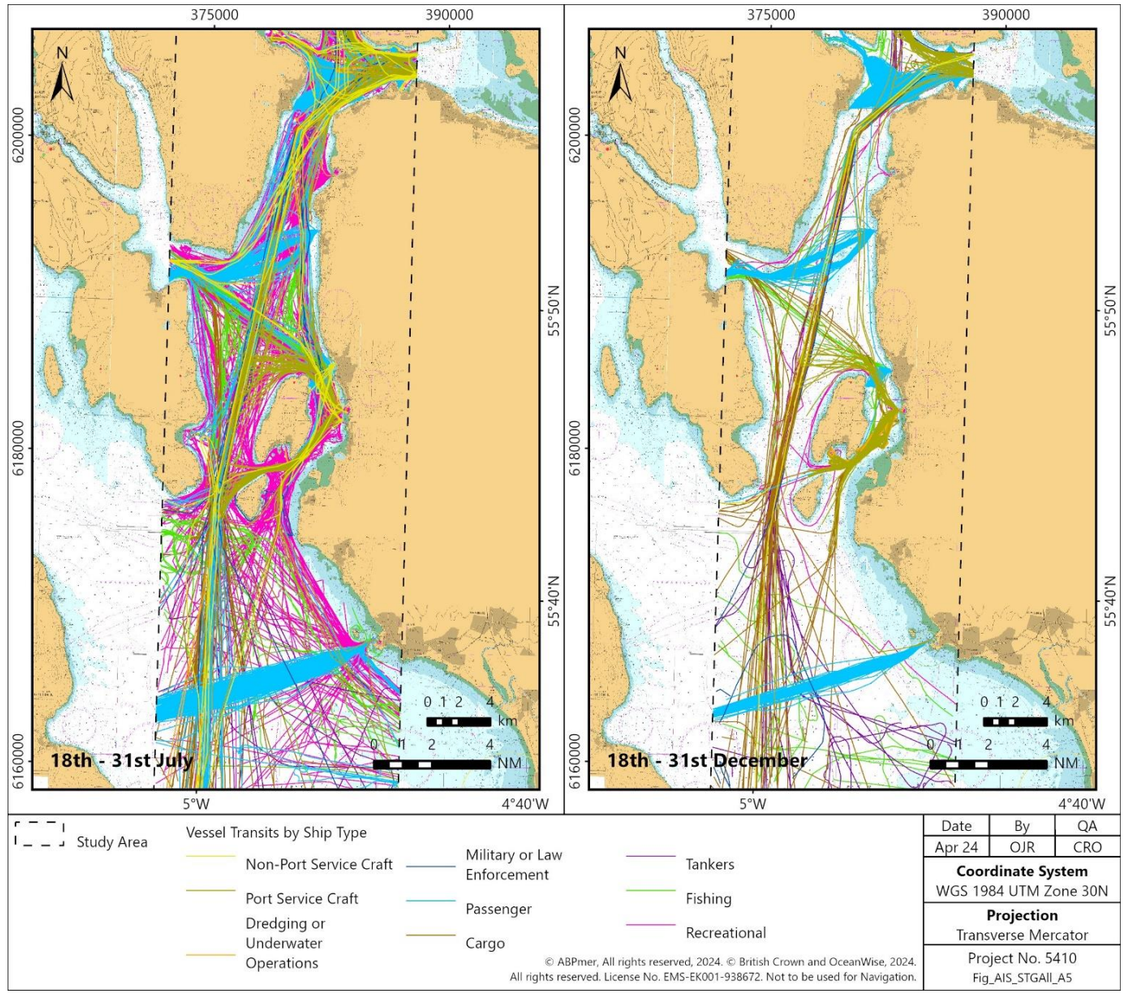


Figure 12-4: All AIS Transits

12.5.6 Incidents

This section reviews the marine incidents that have been reported within the study area over aa period of 10 years between 01 January 2013 and 31 December 2022. Data has been collected from three sources, namely:

- Maritime Accident and Investigation Branch (MAIB),
- Royal National Lifeboat Institution (RNLI) call out data, and
- Clydeport's Incident Data.

These datasets hold the details of all reported marine safety incidents and other occurrence s which have potential significance to navigational safety. The data collected is shown in Table 12-8 to Table 12-10. The reported incidents have also been mapped onto a local chart and colour coded as per their category to determine possible areas where certain incidents are more likely to occur (Figure 12-5 to Figure 12-6).

Table 12-8: MAIB Marine incident summary for the study area (2013 to 2022)

Incident Category	Year											Annual Frequency
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
Collision	1	1		4	2	0	0	0	1	1	10	1
Equipment failure (vessel)	2	1	1	2	0	3	2	3	4	2	20	2
Fire/ Explosion	0	1	3	0	0	0	1	1	2	0	8	0.8

Incident Category	Year											Annual Frequency
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
Grounding	1	2	0	0	0	2	1	2	1	3	12	1.2
Impact with structure	0	2	0	0	0	0	1	1	1	1	6	0.6
Other nautical safety	0	2	0	0	1	2	2	4	2	1	14	1.4
Person in Distress	1	4	3	4	5	3	4	3	1	6	34	3.4
Person(s) in the water	2	0	0	0	1	0	0	0	0	0	3	0.3
Grand Total	7	13	7	10	9	10	11	14	12	14	107	10.7

Table 12-8 presents MAIB incident records, and the location of MAIB accident/incident reports are shown at Figure 12-5. It identifies there were 107 incidents between 2013 and 2022. This equates to an average annual frequency of 10.7 reportable MAIB incidents per year, for the study area. Ports and vessel operators are required to report certain incidents to the MAIB and tend to be incidents which are more serious in nature or had the potential to be more serious. The most frequently reported incident type was 'Person in Distress' which occurred 34 times over the 10-year period. The next most frequently reported category was 'Other nautical safety' with a total of 14 reports. The closest incident to the Proposed Development Site included 2 groundings which both include recreational craft grounding.

Table 12-9: RNLI Marine incident summary for the study area (2013 to 2022)

Incident Category	Year											Annual Frequency
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total	
Capsize/Sinking	3	0	2	2	5	2	6	0	0	0	20	2
Collision	0	0	0	0	0	0	0	0	0	2	2	0.2
Equipment failure (vessel)	10	13	15	18	12	10	10	9	12	7	116	11.6
Grounding	4	6	4	2	3	2	3	1	4	5	34	3.4
Impact with Structure	0	0	0	0	0	1	0	0	0	0	1	0.1
Leaks/Swamping	2	1	0	0	0	0	0	0	0	0	3	0.3
Other nautical safety	7	14	5	11	20	26	47	28	35	23	216	21.6
Person in Distress	6	3	5	2	1	7	2	2	2	0	30	3
Person(s) in the Water	1	4	6	4	0	1	1	0	0	0	17	1.7
Grand Total	33	41	37	39	41	49	69	40	53	37	439	43.9

Table 12-9 presents RNLI national dataset incidents, and their locations are displayed at Figure 12-6: RNLI Accidents/ Incidents Figure 12-6. It shows there were 439 incidents recorded in the 10-year period. For the RNLI dataset, the most frequent type of incident was 'Other nautical safety' with 216 incidents and making up 49% of the total incidents. While there are a number of these incidents spread across the study area it can be seen in Figure 12-6, that there is a large majority which occur within the East coast of the Firth of Clyde and within the Hunterston Channel, the incident location indicate proximity to the main marinas including Largs Yacht Haven and Kip Marina. The incidents in these areas are largely associated with Equipment failure (Vessel) and Other nautical safety. The closest incidents to the development site include an equipment failure and a grounding which both occurred to the south edge of the Proposed Development Site.

Table 12-10: Clydeport's Marine incidents (2013 to 2022)

Incident Category	Year									Annual Frequency
	2017	2018	2019	2020	2021	2022	2023	2024	Total	
Close Quarters Situation	2	1	3	2	0	3	7	0	18	2.25
Collision (Another Vessel|)	0	1	1	0	0	0	0	0	2	0.25
Collision (any fixed object)	0	0	0	0	0	1	1	1	3	0.38
Grounding	0	0	0	1	0	2	1	0	4	0.50
Lost Tow / Failed Line	0	0	0	0	0	0	0	1	1	0.13
Mooring Line / Bollard Failure	0	0	0	2	1	0	1	0	4	0.50
Non-Conformity to Port Regulations	0	0	0	0	0	1	0	0	1	0.13
Onboard Machinery / Hull Failure	0	2	0	2	1	0	2	1	8	1.00
Other Incident (Not Onboard)	0	2	2	2	3	0	0	1	10	1.25
Other Onboard Event	0	2	0	0	0	0	0	0	2	0.25
Other Onboard Incident	1	2	12	3	1	0	1	0	20	2.50
Pollution	0	0	0	0	0	1	0	0	1	0.13

Incident Category	Year									Annual Frequency
	2017	2018	2019	2020	2021	2022	2023	2024	Total	
Sinking / Capsizing / Listing	0	1	0	2	0	0	1	0	4	0.50
Weather	0	0	0	0	0	0	1	0	1	0.13
Grand Total	3	11	18	14	6	8	15	4	79	9.88

Table 12-10 presents Clydeport's local dataset of incidents. Due to the method this data is captured it is not possible to represent spatially however three incidents have been associated with the Hunterston Area. The data shows there were 79 incidents recorded in the 8-year period. For the Clydeport dataset, the most frequent type of incident was 'Other Onboard Incident' with 20 incidents. The second most common incident type is 'Close Quarters Situation' with 18 incidents.

The three incidents that were associated with the Hunterston area included a grounding of a recreational vessels and two Mooring line/Bollard failures at the Hunterston Terminal.

Some incidents will be duplicated across the three datasets due to the way in which they are recorded and stored. As a result it should be noted that it is not possible to definitively remove duplicates. This means that the true total incident rates will be less frequent than stated in this report, as incidents classified as 'MAIB' have also been reported to the RNLI and reported to the Clydeport. For this reason, all incident datasets have been considered individually.

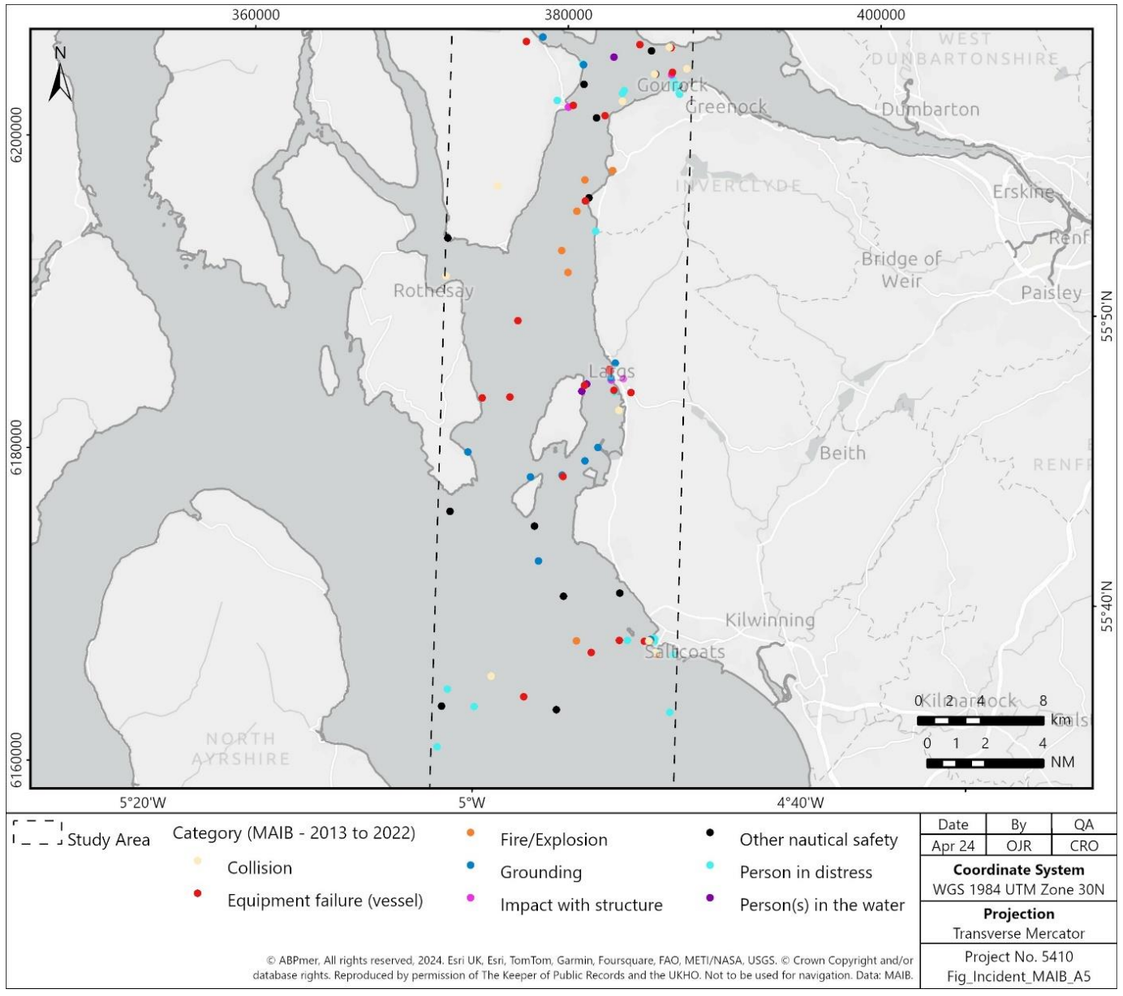


Figure 12-5: MAIB Accidents/ Incidents

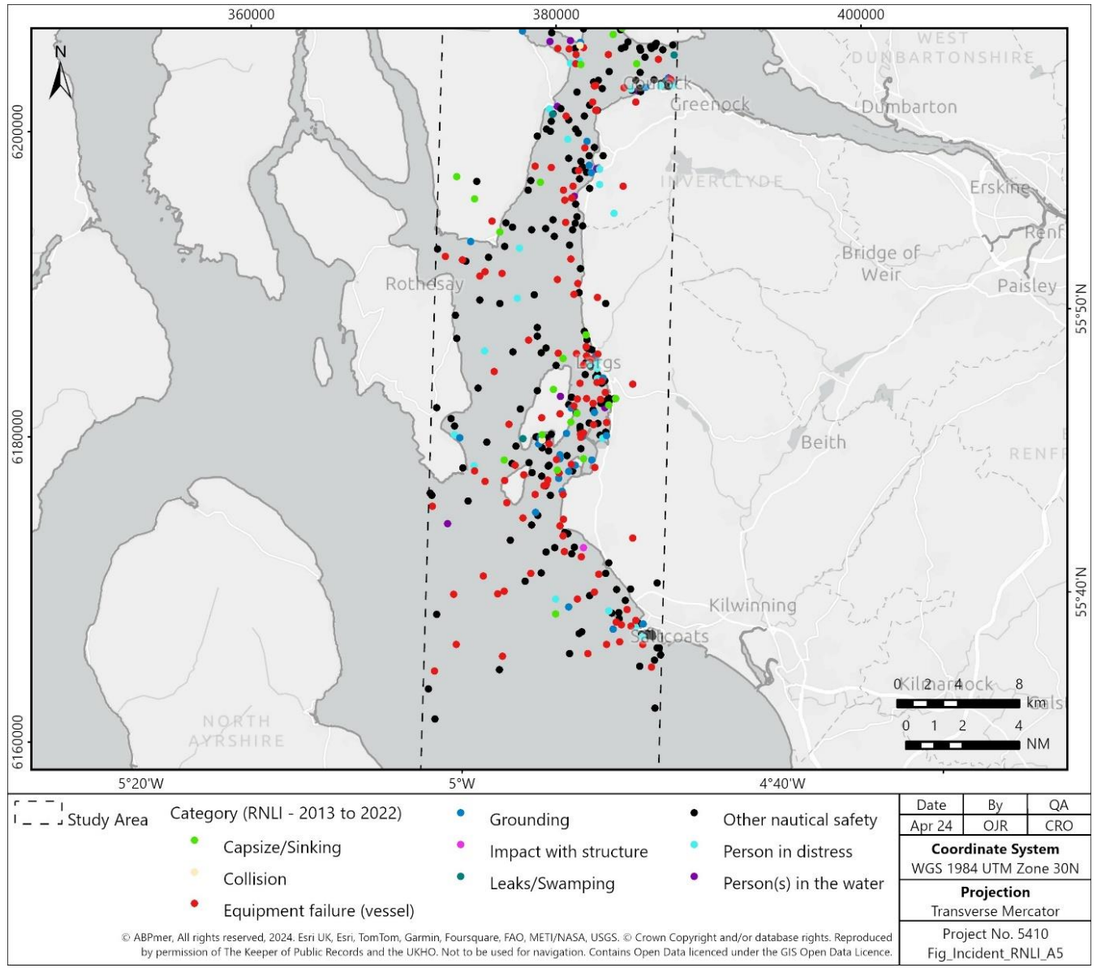


Figure 12-6: RNLI Accidents/ Incidents

12.6 Impact Assessment

12.6.1 Sensitivity of Receptor

The sensitivity of receptors was categorised as per Table 12-5 in the Methodology section (12.4) of this chapter. This was considered for the construction and operational phase both at the embedded and at the future state which assumes that the future controls are put in place by the SHA. Across Table 12-11 and Table 12-12, one risk came out with a Future Sensitivity of 'High' which means that it will need to be considered by the PePG Group Harbour Master, this is further analysed within the NRA as the Technical Appendix which considers the risk in more detail.

Table 12-11: Sensitivity of Navigation Risks during Construction

Sensitivity Navigation Risk during Construction			Embedded Risk Score	Embedded Sensitivity	Future Risk Score	Future Sensitivity
Risk ID.	**Hazard Category**	**Hazard Scenario**				
C12	Accidents to Personnel	Person in the water/ Man overboard	13.5	High	10	High
C2	Collision	Recreational vessel with capital dredge plant	13.5	High	9.5	Medium
C9	Grounding/ Stranding	Work craft manoeuvring for construction activities	12	High	8.5	Medium
C14	Mooring Failure	Jack up barge spud leg failure	10.5	High	8.5	Medium
C15	Mooring Failure	Barge breaks out of mooring	10	High	6.5	Medium
C13	Accidents to Personnel	Diving incident (e.g. cathodic protection installation/ pile inspection)	9.5	Medium	5.5	Medium
C3	Collision	Barge/ suction hopper dredger with another vessel during movements to/ from disposal site	9.5	Medium	4.5	Medium
C4	Collision	Displaced traffic (Recreational)	9.5	Medium	5.5	Medium
C8	Contact/ Allision	Recreational vessel with jack up barge	9.5	Medium	5	Medium
C10	Grounding/ Stranding	Displaced traffic (Recreational)	9	Medium	5.5	Medium
C1	Collision	Commercial vessel with capital dredge plant	9	Medium	5.5	Medium
C7	Contact/ Allision	Commercial vessel with jack up barge	7	Medium	5	Medium
C11	Fire/ Explosion	Fire breaks out on work craft	5.5	Medium	5.5	Medium
C5	Collision	Commercial vessel delivering infrastructure/development components collision with another commercial vessel or recreational vessel	5.5	Medium	4	Medium
C6	Contact/ Allision	Work craft with proposed development	6	Medium	5	Medium

Table 12-12: Sensitivity of Navigation Risks during Operation

Sensitivity Navigation Risk during Operation			Embedded Risk Score	Embedded Sensitivity	Future Risk Score	Future Sensitivity
Risk ID.	**Hazard Category**	**Hazard Scenario**				
O3	Collision	Recreational vessel with maintenance dredger	13.5	High	9.5	Medium
O8	Accidents to Personnel	Person in the water/ Man overboard	13.5	High	8.5	Medium
O7	Payload Related Accident	Loading/ unloading of component (wind)	9.5	Medium	9.5	Medium
O6	Grounding/ Stranding	Commercial vessel in Hunterston Channel	8.5	Medium	5	Medium
O9	Mooring Failure	Mooring break out	8.5	Medium	6.5	Medium

Sensitivity Navigation Risk during Operation			Embedded Risk Score	Embedded Sensitivity	Future Risk Score	Future Sensitivity
Risk ID.	Hazard Category	Hazard Scenario				
O1	Collision	Commercial vessel with maintenance dredger	8	Medium	4.5	Medium
O4	Contact/ Allision	Commercial vessel with development	7.5	Medium	7	Medium
O5	Contact/ Allision	Recreational vessel with development	5.5	Medium	4.5	Medium
O2	Collision	Commercial component delivery to/from development (wind)	5.5	Medium	5	Medium

12.6.2 Magnitude of Impact

The magnitude of impact was considered in accordance with the methodology section of this chapter. Specifically, similar risks, which are already assessed and in place within Clydeport's MSMS, were compared with the risks considered during the construction and operation phases of this proposed development. The categories for the Magnitude of Impact outcomes, both at the embedded and future stage can be found in Table 12-6 within the methodology section (12.4) of this chapter.

Table 12-13: Magnitude of Impact for Navigation Risk during Construction

Magnitude of Impact for Navigation Risk during Construction			NRA Embedded Risk Score	Clydeport Existing Risk Score	Embedded Magnitude of Impact	NRA Future Risk Score	Future Magnitude of Impact
Risk ID.	Hazard Category	Hazard Scenario					
C12	Accidents to Personnel	Person in the water/ Man overboard	13.5	15 (ID: 279 Archived)	No change	10	No change
C2	Collision	Recreational vessel with capital dredge plant	13.5	9 (ID: 44)	Moderate	9.5	Minor
C9	Grounding/ Stranding	Work craft manoeuvring for construction activities	12	12 (ID: 82)	Negligible	8.5	No change
C14	Mooring Failure	Jack up barge spud leg failure	10.5	8 (ID:82)	Moderate	8.5	Minor
C15	Mooring Failure	Barge breaks out of mooring	10	11 (ID: 82)	No change	6.5	No change
C13	Accidents to Personnel	Diving incident (e.g. cathodic protection installation/ pile inspection)	9.5	8 (ID: 88)	Minor	5.5	No change
C3	Collision	Barge/ suction hopper dredger with another vessel during movements to/ from disposal site	9.5	7 (ID: 44)	Minor	4.5	No change
C4	Collision	Displaced traffic (Recreational)	9.5	11 (ID: 50)	No change	5.5	No change
C8	Contact/ Allision	Recreational vessel with jack up barge	9.5	8 (ID: 44)	Minor	5	No change
C10	Grounding/ Stranding	Displaced traffic (Recreational)	9	11 (ID: 50)	No change	5.5	No change
C1	Collision	Commercial vessel with capital dredge plant	9	7 (ID: 44)	Minor	5.5	No change
C6	Contact/ Allision	Work craft with proposed development	6	5 (ID:82)	Minor	5	Negligible
C7	Contact/ Allision	Commercial vessel with jack up barge	7	8 (ID: 44)	No change	5	No change
C11	Fire/ Explosion	Fire breaks out on work craft	5.5	6 (ID:32)	No change	5.5	No change
C5	Collision	Commercial vessel delivering infrastructure/ development components collision with another commercial vessel or recreational vessel	5.5	7 (ID: 44)	No change	4	No change

Table 12-14: Magnitude of Impact for Navigation Risk during Construction

Magnitude of Impact for Navigation Risk during Operation			NRA Embedded Risk Score	Clydeport Existing Risk Score	Embedded Magnitude of Impact	NRA Future Risk Score	Future Magnitude of Impact
Risk ID.	Hazard Category	Hazard Scenario					
O3	Collision	Recreational vessel with maintenance dredger	13.5	9 (ID: 44)	Moderate	9.5	Minor
O8	Accidents to Personnel	Person in the water/ Man overboard	13.5	20 (ID: 82)	No change	8.5	No change
O7	Payload Related Accident	Loading/ unloading of component (wind)	9.5	5 (ID: 82)	Minor	9.5	Minor

Magnitude of Impact for Navigation Risk during Operation			NRA Embedded Risk Score	Clydeport Existing Risk Score	Embedded Magnitude of Impact	NRA Future Risk Score	Future Magnitude of Impact
Risk ID.	Hazard Category	Hazard Scenario					
O6	Grounding/ Stranding	Commercial vessel in Hunterston Channel	8.5	9 (ID: 44)	No change	6.5	No change
O9	Mooring Failure	Mooring break out	8.5	9 (ID: 82)	No change	6.5	No change
O1	Collision	Commercial vessel with maintenance dredger	8	8 (ID: 44)	Negligible	5	No change
O4	Contact/ Allision	Commercial vessel with development	7.5	9 (ID:82)	No change	7	No change
O5	Contact/ Allision	Recreational vessel with development	5.5	5 (ID: 44)	Minor	4.5	No change
O2	Collision	Commercial component delivery to/ from development (wind)	5.5	7 (ID: 44)	No change	5	No change

12.7 Mitigation

The mitigation for this proposed development during the construction and operational phases in the form of future controls, which the SHA can implement are described in this section. It must be noted that as none of the risks presented in the NRA have resulted in an outcome that is 'intolerable', the SHA needs to apply controls as they deem necessary for the risk to be considered 'As Low As Reasonably Practicable'. Mitigation strategies for navigation and port operations associated with the proposed development will be implemented through a comprehensive set of controls to minimize risks and ensure safe operations. These include:

- **Vessel Traffic Management (VTM) Review**: A Vessel Traffic Management review will be conducted by. PePG to review the provision of VTM, specifically with consideration to their LPS resource to monitor marine construction/ dredge craft as well as future marine activity during the operational phase.
- **Project Liaison Officer and Marine Management Plan**: Appointing a Project Liaison Officer and developing a Marine Management Plan will ensure effective communication and coordination among stakeholders. This proactive approach will help identify and address potential risks in real time.
- **Contractor Risk Assessment Method Statement (RAMS)**: Requiring contractors to submit detailed Risk Assessment Method Statements will ensure that all construction risks are identified and managed effectively before work commences, reducing the likelihood of incidents.
- **Education**: Providing education and training sessions for personnel involved in recreational navigation and will enhance awareness of safety protocols and best practices, fostering a safety-conscious culture.
- **Clyde Leisure Navigation Guide**: Updating and disseminating the Clyde Leisure Navigation Guide will inform recreational vessels users of recommended routes and safety precautions, reducing the risk of collisions and navigational incidents.
- **AtoN Review**: Conducting regular reviews of Aids to Navigation (AtoN) will ensure that these markers remain effective and accurate, enhancing navigational safety.
- **Leisure Vessel Recommended Routes**: Establishing recommended routes for leisure vessels will minimize interference with commercial traffic and reduce the risk of accidents in high-traffic areas.
- **Review Clydeport Towage Guidelines and Pilotage Directions**: Regularly reviewing and updating towage guidelines and pilotage directions will ensure that vessels receive appropriate assistance in challenging navigation areas, reducing the risk of incidents.
- **Notice to Mariners**: Issuing regular Notices to Mariners will keep stakeholders informed of changes and hazards in the area, promoting safer navigation practices, especially during the construction phase.
- **Safety Boat**: Deploying a safety boat during the construction phase will provide immediate response capabilities in case of emergencies or incidents on the water.
- **Adherence to CDM Regulations**: Adhering to the Construction (Design and Management) Regulations (CDM) will ensure that safety considerations are integrated into the proposed development design and execution.
- **Flow Monitoring**: Continuous monitoring of vessel traffic flows will enable proactive management of congestion and risks associated with navigation.
- **Prior Notice of Dredge Campaign**: Providing prior notice of dredging activities to mariners will mitigate risks associated with changes to navigation channels and the risk of collision in confined waters.
- **Simulation**: Conducting simulation exercises for navigation and port operations will allow for the testing of emergency response plans and identification of potential weaknesses in planned operations.
- **Emergency (Controlled) Vessel Departure**: Implementing protocols for controlled emergency vessel departures will ensure swift response capabilities during critical situations, such as if winds are too excessive to remain berthed safely alongside.
- **Port Emergency Plan**: Developing and implementing a Port Emergency Plan will establish clear procedures and responsibilities for responding to emergencies effectively.
- **PPG Quayside Audits and Inspections**: Regular audits and inspections of quaysides in accordance with Pollution Prevention Guidelines (PPG) will maintain safety standards and prevent environmental hazards as well as help prevent trips slips and falls.
- **Review Mooring and Berthing Guidelines**: Reviewing and updating mooring and berthing guidelines will enhance safety during docking and departure operations.
- **Safety Area**: Designating safety areas on the quayside will help provide a visual indication to workers as to where it may be unsafe to stand unless actively engaged in activities such as mooring a vessel.
- **Storm Moorings**: Using storm moorings (usually made from steel wire) will secure vessels during severe weather events, reducing the risk of damage or accidents.

By implementing these controls and mitigation strategies, the proposed development can effectively manage risks associated with navigation and port operations, ensuring the safety of personnel, vessels, and the environment.

12.8 Residual Effects

The applied mitigations from the previous section of this chapter aim to reduce each risk. In EIA terms a reduction of the residual effects to an environmentally acceptable level. This section of the EIAR chapter presents the assessment of residual effects with the applied risk controls in place. The hazard scenarios which have incurred a minor magnitude of impact or greater at the embedded stage are discussed and how the potential future mitigations can further reduce this impact.

All other scenarios will be covered in Table 12-15, Table 12-15 and Table 12-16 within the following section, Statement of Significance (12.9) as these are of lesser significance as a function of sensitivity of receptor and magnitude of impact.

12.8.1 Construction

C2 Collision Recreational vessel with capital dredge plant

At the embedded stage this hazard scenario resulted in a Moderate or large Significance due to the assessment having a High Sensitivity and a moderate Magnitude of Impact. This hazard scenario is of significant concern to warrant the future controls being seriously considered by the harbour authority.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Clyde Leisure Navigation Guide;
- Education;
- AtoN review;
- Contractor Risk Assessment Method Statement (RAMS);
- Leisure vessel recommended routes; and
- Notice to Mariners.

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a minor making the Significance of this scenario of Slight Significance. This potential degree of significance is not of concern.

C14 Mooring Failure Jack up barge spud leg failure

At the embedded stage this hazard scenario resulted in a Moderate or large Significance due to the assessment having a High Sensitivity and a moderate Magnitude of Impact. This hazard scenario is of significant concern to warrant the future controls being seriously considered by the Harbour Authority.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Project Liaison Officer and Marine Management Plan;
- Contractor Risk Assessment Method Statement (RAMS) ; and
- Adherence to CDM Regulations.

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a minor making the Significance of this scenario of Slight Significance. This potential degree of significance is not of concern.

C13 Accidents to Personnel Diving incident (e.g. cathodic protection installation/ pile inspection)

At the embedded stage this hazard scenario resulted in a Slight Significance due to the assessment having a medium Sensitivity and a minor Magnitude of Impact.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Safety boat;
- Contractor Risk Assessment Method Statement (RAMS);
- Vessel Traffic Management review; and
- Project Liaison Officer and Marine Management Plan.

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a no-change making the Significance of this scenario of Neutral.

C3 Collision Barge/ suction hopper dredger with another vessel during movements to/ from disposal site

At the embedded stage this hazard scenario resulted in a Slight Significance due to the assessment having a medium Sensitivity and a minor Magnitude of Impact.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Education;
- Vessel Traffic Management review;
- Project Liaison Officer and Marine Management Plan; and
- Contractor Risk Assessment Method Statement (RAMS).

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a no-change making the Significance of this scenario of Neutral.

C8 Contact/ Allision Recreational vessel with jack up barge

At the embedded stage this hazard scenario resulted in a Slight Significance due to the assessment having a medium Sensitivity and a minor Magnitude of Impact.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Leisure vessel recommended routes;
- Project Liaison Officer and Marine Management Plan;
- Vessel Traffic Management review; and
- Contractor Risk Assessment Method Statement (RAMS).

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a no-change making the Significance of this scenario of Neutral.

C1 Collision Commercial vessel with capital dredge plant

At the embedded stage this hazard scenario resulted in a Slight Significance due to the assessment having a medium Sensitivity and a minor Magnitude of Impact.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- AtoN review;
- Vessel Traffic Management review;
- Project Liaison Officer and Marine Management Plan;
- Safety boat; and
- Contractor Risk Assessment Method Statement (RAMS).

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a no-change making the Significance of this scenario of Neutral.

C6 Contact/ Allision Work craft with proposed development.

At the embedded stage this hazard scenario resulted in a Slight Significance due to the assessment having a medium Sensitivity and a minor Magnitude of Impact.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Review Clydeport towage guidelines and pilotage directions;
- Contractor Risk Assessment Method Statement (RAMS);
- Vessel Traffic Management review; and
- Project Liaison Officer and Marine Management Plan.

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a Negligible making the Significance of this scenario on the threshold of Neutral or slight and as such the significance is not of concern.

12.8.2 Operation

O3 Collision Recreational vessel with maintenance dredger

At the embedded stage this hazard scenario resulted in a Moderate or Large Significance due to the assessment having a High Sensitivity and a medium Magnitude of Impact.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Clyde Leisure Navigation Guide;
- Education;
- Notice to Mariners; and
- Prior notice of dredge campaign.

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a minor making the Significance of this scenario on the threshold of Slight and as such the significance is of minimal concern.

O7 Payload Related Accident Loading/ unloading of component (wind)

At the embedded stage this hazard scenario resulted in a Slight Significance due to the assessment having a Medium Sensitivity and a Minor Magnitude of Impact.

To mitigate the risk 'Port emergency plan' was added as a potential future control for inclusion by the SHA.

This future mitigation has no impact to the significance of this hazard scenario which remains at a Slight Significance following their potential inclusion. This significance is of minimal concern.

O5 Contact/ Allision Recreational vessel with development

At the embedded stage this hazard scenario resulted in a Slight Significance due to the assessment having a Medium Sensitivity and a Minor Magnitude of Impact.

To mitigate the risk the following future controls for potential inclusion by the SHA were identified:

- Vessel Traffic Management review;
- Education; and
- Clyde Leisure Navigation Guide.

If the future mitigations are to be added this hazard scenario is anticipated to have reduced residual effects as the Magnitude of Impact results in a no-change making the Significance of this scenario of Neutral.

12.9 Statement of Significance

Within the context of conserving safe navigation Table 12-15 and Table 12-16 identify the significance of each hazard scenario.

Table 12-15: Comparison of Significance Construction

Risk ID	Hazard Scenario	Embedded Significance	Future Significance
C1	Commercial vessel with capital dredge plant	Slight	Neutral
C2	Recreational vessel with capital dredge plant	Moderate or large	Slight
C3	Barge/ suction hopper dredger with another vessel during movements to/ from disposal site	Slight	Neutral
C4	Displaced traffic (Recreational)	Neutral	Neutral
C5	Delivery of infrastructure/development components	Neutral	Neutral
C6	Work craft with proposed development	Slight	Neutral or slight
C7	Commercial vessel with jack up barge	Neutral	Neutral
C8	Recreational vessel with jack up barge	Slight	Neutral
C9	Work craft manoeuvring for construction activities	Slight	Neutral
C10	Displaced traffic (Recreational)	Neutral	Neutral
C11	Fire breaks out on work craft	Neutral	Neutral
C12	Person in the water/ Man overboard	Neutral	Neutral
C13	Diving incident (e.g. cathodic protection installation/ pile inspection)	Slight	Neutral
C14	Jack up barge spud leg failure	Moderate or large	Slight
C15	Barge breaks out of mooring	Neutral	Neutral

Table 12-16: Comparison of Significance Operation

Risk ID	Hazard Scenario	Embedded Significance	Future Significance
O1	Commercial vessel with maintenance dredger	Neutral or slight	Neutral
O2	Commercial component delivery to/from development (wind)	Neutral	Neutral
O3	Recreational vessel with maintenance dredger	Moderate or large	Slight
O4	Commercial vessel with development	Neutral	Neutral
O5	Recreational vessel with development	Slight	Neutral
O6	Commercial vessel in Hunterston Channel	Neutral	Neutral
O7	Loading/ unloading of component (wind)	Slight	Slight
O8	Person in the water/ Man overboard	Neutral	Neutral
O9	Mooring break out	Neutral	Neutral

Hazard Scenarios C2, C14 and O2 result in a Moderate or Large Significance at the embedded stage, however with the future control mitigations identified in Technical Appendix 12.1 and in the Mitigation section (12.7) of this chapter the significance is reduced to slight.

This chapter has evaluated the potential marine safety impacts resulting from the proposed HCY development on the existing navigational environment. The assessment has concluded that after future control mitigation is applied, the construction and operational marine activities for HCY will have Slight to Neutral impact and are of minimal residual concern to the SHA.

13 SUPPORTING ASSESSMENTS

13.1 Air Quality

13.1.1 Introduction

During the construction phase there is potential for construction activities including earthworks, general construction activities and track-out to impact local air quality.

13.1.2 Baseline Conditions

The development site is located within a relatively rural area influenced by maritime weather conditions. In order to inform the Scoping Report, the relevant 1km background air quality concentration maps were obtained from the Scottish Air Quality and DEFRA websites. The 2021 measured annual average concentrations of NO_2, PM_{10} and $PM_{2.5}$ for Hunterston indicates that air quality is good with the pollutant concentrations being well below the relevant National Air Quality Objectives of 40µg/m^3, 18µg/m^3 and 10µg/m^3 respectively. The 2022 Air Quality Annual Progress Report for North Ayrshire Council (the most up-to-date report available) does not identify any Air Quality Management Areas (AQMAs) within the council area.

13.1.3 Potentially Significant Effects

The main concern in relation to air quality impacts is considered to be from construction generated dust emissions. As the site is not located within an Air Quality Management Area (AQMA) and there are no residential receptors immediately adjacent to the proposed construction works it is considered that there will not be significant effects associated with construction dust.

A Construction Dust Risk Assessment (CDRA) was produced for the proposed development and is provided as Technical Appendix 13.1 of this EIAR).

The risk of impacts for dust soiling and the health effects of PM_{10} were assessed at six human sensitive receptors in the vicinity of the site. The assessment results in the determination of a Low risk of dust soiling impacts and a Low risk of health impacts for Demolition, Earthworks, Construction and Trackout activities.

The risk of impacts for dust soiling were assessed at two ecological sensitive receptors in the vicinity of the site. The assessment results in the determination of a Medium risk of dust soiling impacts for Demolition, Earthworks and Construction activities.

The results of the assessment of the risk of impacts indicates that mitigation measures to control dust emissions that may arise due to demolition, earthworks, construction and trackout activities are adopted for the duration of the development in order to protect human sensitive receptors from dust impacts

A site-specific Construction Dust Management Plan (CDMP) detailing mitigation requirements with respect to construction dust has been produced and is provided as Technical Appendix 13.2, Volume 3 of this EIAR.

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13.2 Material Assets and Waste

13.2.1 Introduction

This section addresses the issue of material assets and waste generation during both the construction and operational phases of the proposed development.

13.2.2 Baseline Conditions

The proposed development is located within the site of the existing Hunterston Construction Yard. The immediate environment is dominated by the associated Hunterston PARC site with the Hunterston A and B facilities located to the south of the site area.

In terms of natural assets, the Firth of Clyde is located immediately adjacent to the site to the site and is used for commercial and recreational shipping, Chapter 12 provides more detail on navigation. As discussed in more detail in Chapter 5 Biodiversity, the Hunterston and Southannan Sands SSSI are located in the immediate vicinity of the site.

13.2.3 Potential Impacts

Construction Phase

The waste hierarchy will be employed throughout the construction works and will aim to avoid, or minimise waste production where possible, re-use material where possible, segregate waste which cannot be reused for recycling where available, and implement the correct methods of disposal should none of the aforementioned methods be feasible.

As part of the development works a total of approximately 1.5million m^3 of material requires to be dredged from areas adjacent to the site. A BPEO that assesses this material is provided as Technical Appendix 9.2 in Volume 3 of this EIAR. The BPEO concludes that where this material is geotechnically suitable and available at suitable time in the proposed development programme then the best practicable environmental option for its disposal is reuse as part of the dry dock infill at the site. Should the material not meet the requirements to allow for its beneficial reuse then it will be disposed of at a licensed spoil ground. It is considered that other waste materials generated as part of this development will be minor compared to the dredge volume generated. It is not expected that hazardous waste will be generated as part of the works

The infilling of the dry dock itself requires approximately 1.3millon m^3 of imported material which is principally proposed to be formed of waste dredge arisings. This beneficial reuse of dredge arisings is considered to be in line with Policy 12 of NPF 4 to "… support the circular economy and meet identified needs in a way that moves waste as high up the waste hierarchy as possible".

Operational Phase

The need for and frequency of maintenance dredging campaigns will depend on the future rate of sediment accretion and the draught of vessels using HCY. Clydeport, as the SHA, will undertake routine bathymetric surveys to monitor seabed levels and determine the need for maintenance dredging. Maintenance dredging campaigns for HCY are likely to be coordinated with campaigns undertaken at Clydeport's other locations. The current BPEO for Clydeport's maintenance dredge campaigns identifies beneficial reuse as the preferred disposal option where appropriate projects are available.

13.2.4 Mitigation Measures

Please refer to Chapter 9 and Technical Appendix 9.2 (Volume 3 of this EIAR) in relation to mitigation measures with respect to the proposed dredging and disposal activities.

8 and Chapter 12 detail mitigation requirements with respect to Traffic and Navigation. Chapter 13 details considerations with respect to Carbon Impact.

13.3 Carbon, Climate Change and Greenhouse Gas Emissions Assessment

Introduction

This report details the embodied carbon assessment conducted for the new Hunterston Construction Yard, hereafter referred to as "the development". The development includes the proposal of:

- Demolition of existing structures including removal of the base of the former dry dock;
- Infilling of the dry dock to form a working platform;
- Formation of 570m quay wall 500mm back from MHWS i.e. in the terrestrial environment;
- Formation of a temporary working platform;
- Removal of the existing rock armour on the western boundary;
- Removal of the existing bund on the western boundary;
- Installation of sub-surface revetments for the new quay wall;
- Installation of fenders and other quay wall infrastructure i.e. drainage outfalls, mooring bollards and safety ladders and navigational aids ;
- Erection of port infrastructure including lighting columns, substations, drainage, security fencing, access gates, access road improvements (including resurfacing) and CCTV;
- Erection of temporary site offices and staff welfare buildings to accommodate site workforce.
- Capital Dredging to a depth of -12m CD;
- Construction of up to 5 mooring dolphins;
- Installation and removal of a temporary grounding pad;
- Disposal of dredging spoil to a licensed marine spoil disposal site;
- Installation of navigational aids.

Following on from the construction phase the site will remain as an operational port facility. On this basis the significant carbon associated with the proposed development is solely related to the construction phase, however for the purposes of the assessment maintenance dredging has been incorporated as part of the overall assessment

The report therefore aims to assess the capital carbon emissions deriving from the activities of the phase including both capital and maintenance dredging of the proposed development, as detailed above.

As this assessment scope is mainly bound to the temporal cope and impacts occurring during only the construction phase, this chapter follows the PAS 2080:20s23 Carbon Management in Buildings and Infrastructure methodology.[115] PAS 2080:2023 is a specification for whole life carbon management within the built and infrastructure sector and sets out the general principles of a carbon management process. The framework looks at the whole value chain of the construction phase, aiming to reduce carbon and reduce cost through more intelligent design, construction, and use.

Effective carbon management in infrastructure and buildings will make an important contribution to tackling climate change and leave a positive legacy for future generations.

Scoping and Consultation

Table 13-1 Scoping Opinion on Climate Change

Authority	Scoping Opinion	Technical Discipline Response
Marine Directorate	*"The Scottish Ministers are mindful that Greenhouse Gas ("GHG") emissions from all projects contribute to climate change. In this regard, the Scottish Ministers highlight the IEMA Environmental Impact Assessment Guide "Assessing Greenhouse Gas Emissions And Evaluating Their Significance" ("IEMA GHG Guidance"), which states that "GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as a such any GHG emissions or reductions from a project might be considered significant." The Scottish Ministers have considered this together with the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the requirement of the EIA Regulations to assess significant effects from the Proposed Works on climate. The Scottish Ministers therefore advise that the EIA Report must include a GHG Assessment which should be based on a Life Cycle Assessment ("LCA") approach and note that the IEMA GHG Guidance provides further insight on this matter. The Scottish Ministers highlight however that this should include the pre-construction, construction, operation and decommissioning phases, including consideration of the supply chain as well as benefits beyond the life cycle of the Proposed Works.* *The Scottish Ministers advise that carbon, climate change and greenhouse gases are scoped in for further assessment within the EIA Report for all phases"*	The 2017 IEMA guidance stated that *"… it might be considered that all GHG emissions are significant…".* Whereas the 2022 IEMA guidance presents more nuanced levels of significance. In the EIA context it now provides relative significance descriptions. There are five distinct levels of significance which are not solely based on how the project makes a relative contribution towards achieving a science-based 1.5°C aligned transition towards net zero. However, as this assessment is focussed primarily on the construction phase only of the development, it was deemed more appropriate to follow PAS 2080:2023 methodology in carbon management in built and infrastructure sector. IEMA 2022 guidance is advised to be followed for whole life carbon assessment, including operational phase. PAS 2080:2023 assesses emissions across the whole value chain of the construction phase.
North Ayrshire Council	*"A Carbon Impact Assessment should form part of any EIA Report. The methodology set out in Chapter 7 of the Scoping Report dated Sept 2023 is agreed"*	This technical report forms part of the ES as a supporting appendix and has been summarised as a supporting section of the EIAR.. The methodology detailed in the scoping report is what has been adopted.
RYA Scotland	*"The report mentions in 13.2.9.2 that the UKCP18 data did not show any compelling trend in storminess, which is correct.*	With the temporal scope of this assessment is focussed on the construction phase only, it is not anticipated that verifiable climate change

[115] PAS2080:2023 - Carbon Management in Infrastructure and Built Environment. (2023). BSI Standards Limited 2023.

Authority	Scoping Opinion	Technical Discipline Response
	However, there is more up to date and comprehensive information on the website of the Marne Climate Change Impacts Partnership (https://www.mccip.org.uk/)."	would occur between the time of design to the end of the construction phase (over the next 5 years). As such, there are no climate change impacts that will be significant to resilience of the development over the construction period, thus the assessment of climate resilience for this assessment is scoped out.

Policy, Legislation and Guidance

International

The Paris Agreement is a legally binding international treaty on climate change. The treaty was adopted by 196 parties at COP21 (Conference of the Parties) in Paris, in 2015. The Paris Agreement and subsequent scientific reports, including Intergovernmental Panel on Climate Change (IPCC) reports concluded that:

- Global warming is likely to reach 1.5°C between 2030 and 2035 at current trends, and,
- Global 'rebalancing' must be pursued at pace and requires interim emission cuts of around 50% by 2030, for any prospect of staying close to 1.5°C of warming.

To achieve this long-term climate change mitigation goal, countries aim to reach a global peak of GHG emissions as soon as possible to achieve a climate neutral world by 2050. Each signatory to the Paris

Agreement has a duty to produce a Nationally Determined Contribution (NDC), indicating how state-level transformations will contribute to climate action.

National

The Climate Change Act (2008) is central to the UK Government's plan to reduce carbon emissions. The Act is a legally binding target to reduce the UK's GHG emissions by a reduction of 80% against 1990 levels by 2050. In May 2019, the UK Government declared a climate emergency, leading to updating the commitments in the 2008 Act to target net zero carbon emissions by 2050 under the Climate Change Act (2050 Target Amendment) Order 2019.

Following the UK publication of The Climate Change Act, the Scottish Government produced the Climate Change (Scotland) Act 2009 which sets the statutory framework for GHG emission reductions in Scotland. However, this was amended by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, which increased the ambition of Scotland's emissions reduction targets to net zero by 2045 and revised interim and annual emissions reduction targets to the following:

- 2030 is at least 75% lower than the 1990/1995 baseline; and
- 2040 is at least 90% lower than the 1990/1995 baseline.

The Climate Change Plan 2018-2032: Securing a Green Recovery on a Path to Net Zero and Climate Ready Scotland: Second Scottish Climate Change Adaptation Programme 2019-2024 set out key steps for achieving a reduction in greenhouse gas emissions across Scotland.

Within the Draft Energy and Just Transition Plan it states that the "Scottish Government is clear that unlimited extraction of fossil fuels is not consistent with our climate obligations".

Regional

The North Ayrshire Local Development Plan (LDP) 2019 sets out a vision and spatial strategy for the development of land in North Ayrshire over the next 20 years. If a proposal is contrary to any single policy within the LDP, then it does not accord with the Plan.

One key and relevant policy is POLICY 29 – Energy Infrastructure Development, where it was stated that development will be supported where "they will contribute positively to our transition to a low carbon economy and have no unacceptable adverse environmental impacts".

Methodology

As detailed throughout the IEMA 2022 *Assessing Greenhouse Gas Emissions and Evaluating their Significance*[116] guidance, PAS2080:2023 is an appropriate assessment scheme in identifying carbon emission impact and adopting best practice carbon management principles. Adopting the PAS 2080:2023 methodology will provide emphasis on carbon management of construction phase; which includes emissions associated with pre-construction, transport of materials to site, construction processes of the materials across the lifecycle modules within PAS 2080:2023 (A1-5).

The spatial scope of this assessment is focus on the construction phase of the proposed development. Therefore, the carbon assessment boundary covers the pre-construction and construction emissions (A1 – A5) emissions. Pre-construction and construction phases comprise the physical assets associated with the development and are hereafter referred to as the "**capital carbon**" of the development. This includes emissions associated with sourcing of materials and construction activities and are defined in terms of lifecycle stages, detailed in PAS 2080 and RICS (2023), as follows:

- Products and materials (A1-3) - use of materials for temporary and permanent construction activities.
- Transport to the Project site (A4) - the transportation of materials to the proposed development, e.g., by heavy good vehicles (HGV); and
- Construction and installation processes (A5) - construction plant use.

[116] IEMA. 2022. *Assessing Greenhouse Gas Emissions and Evaluating their Significance*. Available at: IEMA - Launch of the Updated EIA Guidance on Assessing GHG Emissions - February 2022

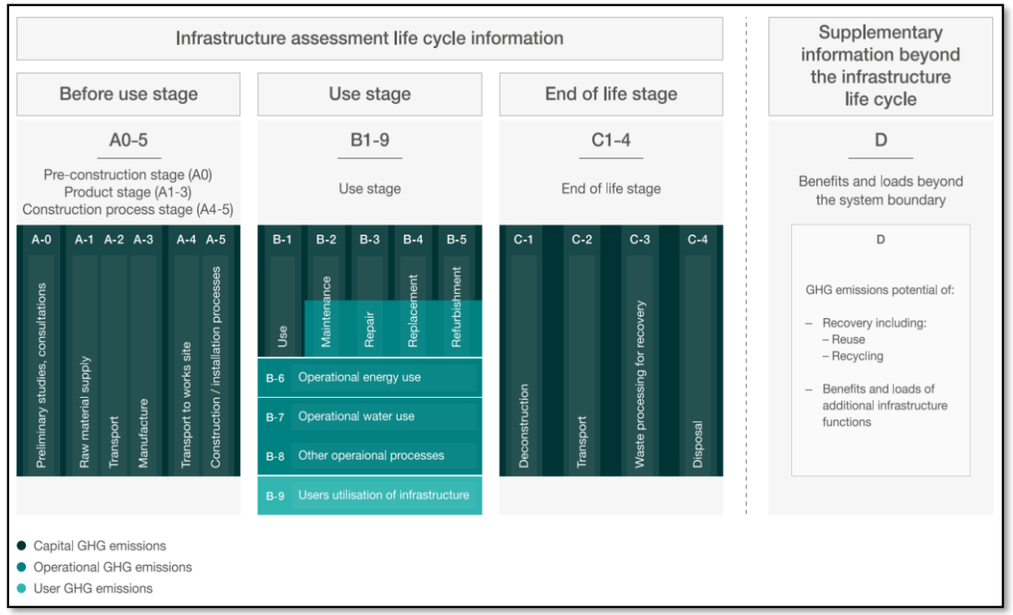

Figure 13-1 PAS 2080 Life Cycle Modules

Climate Resilience

With the temporal scope of this assessment predominantly focusing on the construction phase, it is not anticipated that verifiable climate change would occur between the time of design to the end of the construction phase (over the next 5 years). As such, there are no anticipated climate change impacts that will be significant to resilience of the development over the construction period.

Climate change will have a material impact on the resilience of the proposed development during operational phase and it is being addressed in the Chapter 9 with respect to ongoing operation as a port facility.

Carbon Emission Assessment Methodology

As advised by IEMA 2022, the Greenhouse Gas (also referred to as “carbon” or “emission”) quantification within this carbon assessment follow the principles outlined in the GHG Protocol Corporate Standard and PAS 2080:2023.

The assessment methodology aligns with the modular framework set out in PAS 2080:2023 Carbon Management in Buildings and Infrastructure. From previous project experience and industry guidance, such as *RICS Professional Statement for Whole Life Carbon Assessment for the Built Environment (2023)*[117], it is known that the majority of embodied carbon falls within the A1-A5 (before use).

For the assessment of the development’s emissions, a calculation method is used following data collection. The calculation of GHG emission that is used in this assessment follows that provided within the GHG Protocol and is defined as:

Activity Data x Emission Factor = GHG Emission (kgCO_2e)

The material quantities were sourced from the ‘Approximate Cost Rev 4.0’ document produced by Arch Henderson (dated 15/02/2024). Various industry standards and databases were used to source the carbon emission factors to calculate the construction and plant emissions. Table 13-2**Error! Reference source not found.** details the emission factor sources according to the product life cycle stage.

Table 13-2 Capital Carbon Emissions Considered in the Assessment

Life Cycle Stage	Guidance	Industry Standard / Source of Carbon Factors
A1 – A3	Product	CESSM4
A4	Transport of materials to project site	RICS 2023
A5	Construction and installation processes	CESSM4

Sweco’s carbon estimating tool was used to calculate emissions associated with the development. Emission factors derived from industry leading guidance, such as those from CESSM4 and the Inventory of Carbon and Energy (ICE) databases, are embedded within the tool. The tool also uses RICS (2023) guidance and associated emission factors to inform A4 emissions. The emission factor (kgCO_2e/kg) associated with each distance category (Local, National or European) is used depending on the distance from the source location of materials to the construction site.

For some specific items, additional sources of information were identified and the emission factors within these reports were used. These were:

- Dredging: The Crown Estate, 'Marine Estate Research Report: Carbon Footprint of Marine Aggregate Extraction', 2010.

Assumptions

For the assessment of A4 emissions, it is assumed that materials are locally sourced (50km radius) unless informed otherwise. An assumption of 50km for dredged material and 220km for imported aggregate was considered. Where it is assumed, materials will be site won, no transport emissions have been associated with these.

Impact Assessment

The Capital Carbon emission total for the development during construction phase and maintenance dredging, is **250,975** tCO_2e. Emissions from the construction phase, which covers the capital carbon of the development, are summarised in Table 13-3: E.

[117] Royal Institution of Chartered Surveyors (RICS) (2023). *Whole life carbon assessment for the built environment*. Available at: https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment

Table 13-3: Emissions arising from the construction phase (A1-5)

Life Cycle Stage	Activity	Emissions (tCO_2e)
A1 – A3	Embodied carbon of materials used	135,894
A4	Transportation of materials to site	44,886
A5	Construction site emissions	70,195
Total Construction Phase Emissions (tCO_2e)		**250,975**

Embodied carbon emissions from construction materials are the main contributor to climate change impacts during the construction phase, with additional emissions arising from the direct use of plant and transport of materials to site. The total capital carbon of the construction, capital and maintenance (dredging) of the development was **250,975 tCO_2e.**

Emissions associated with *Earthworks* and *Concrete Ancillaries* were the most carbon intensive elements of the proposed development during the construction phase; both elements resulting in more than 100,000 tCO_2e in emissions.

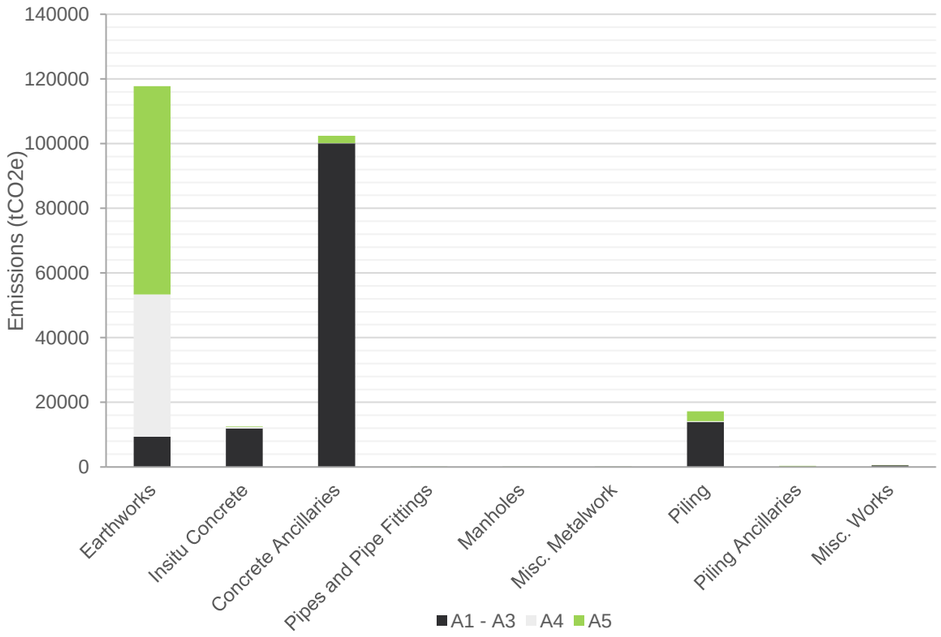

Figure 13-2: Emissions associated with lifecycle Stage A across all activities.

For *Earthworks,* the first emission hotspot was the A5 emissions, more specifically, the emissions arising from onsite construction processes necessary for the excavation and disposal of dredged material; this contributed 94% of the A5 emission total of *Earthworks* (64,350 tCO_2e).

For *Earthworks*, a second emission hotspot was the A4 emissions (transport of material to site). This includes the sourcing of imported quarried aggregate with an emission total of 36,293 tCO2e, and the transport of dredged material, with an emission total of 7,767 tCO2e. Assumed transport distances from Clyde to proposed development have been considered. Due to the significant quantity of dredged material to be transported, it has resulted in an emission total of 2,904 tCO_2e.

Both A4 and A5 emissions hotspots are the result of the large quantities of dredged material and quarried aggregate requiring excavation and transport.

For *Concrete Ancilliaries*, the emission hotspot is evidently from the embodied carbon (A1-A3) of the material used for construction of this element. Steel was the assumed material of choice associated with formwork and reinforcement, this is a carbon intensive material and used in significant quantities has resulted in an embodied carbon (A1-A3) emission total of 100,101 tCO_2e.

Mitigation

Carbon Reduction Hierarchy

PAS 2080 promotes the carbon reduction hierarchy (Figure 13-3: PAS 2080 Carbon Reduction Hierarchy) which helps value chain members to identify potential opportunities to reduce carbon.

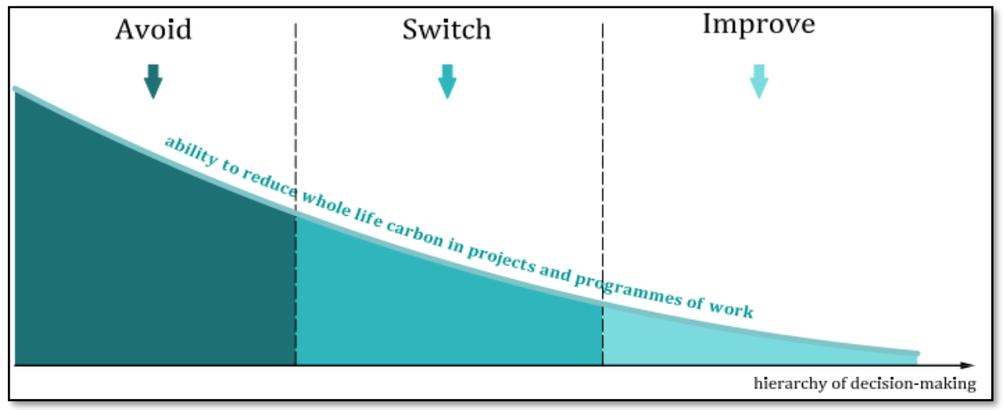

Figure 13-3: PAS 2080 Carbon Reduction Hierarchy

The carbon reduction hierarchy highlights the importance of implementing measures of carbon reduction at the early stages, where the potential of carbon reduction is greatest. In applying the carbon reduction hierarchy, the following is considered:

1) **Avoid:** align the outcomes of the proposed development and/or programme of work with the net zero transition at the system level and evaluate the basic need at the asset and/or network level. This may include exploring the necessity of constructing a new asset/network or reusing/retrofitting/repurposing existing ones.

This project and wider development at Hunterston are recognised as of strategic national importance as an energy hub and deep-water port.[118] *As the carbon impact of this project would be significant, does the development require*

[118] North Ayrshire Council (2019). *Adopted Local Development Plan*.

the construction of the asset? Where construction cannot be avoided, does the asset negate the need for other similar developments elsewhere in the region?

2) **Switch:** assess alternative solutions and then adopt one that reduces whole life emissions through alternative scope, design approach, materials, technologies for operational carbon reduction, among others, while satisfying the whole life performance requirements.

Due to the high energy requirements and chemical processes involved in the production and transport of concrete and steel, these elements are most significant contributors to the overall carbon footprint of deep-water port construction. Optimising design to reduce material use and transport requirements, with a focus on concrete and steel, will have the most impact in reducing the carbon impact of the project. This could include material replacements to low-carbon alternatives, such as steel produced by electric arc furnace, or optimisation of construction methods, such as utilising 3D concrete printing to minimise material requirements.

3) **Improve**: identify and adopt solutions and techniques that improve the use of resources and design life of an asset/network, including applying circular economy principles to assess materials/products in terms of their potential for reuse or recycling after end of life.

Intended reuse of in situ rock amour is one solution that minimises the carbon impact from materials utilised in the construction of the asset, due to reduced emissions from procurement and transport of materials. Where in situ rock armour is no longer needed, it is intended to be crushed into aggregate and reused. Consider the end-of-life of other required materials – can they be reused or recycled, and if not, what can be done to change this?

In identifying appropriate low-carbon solutions, priority should be given to solutions that promote network and system decarbonization as far as possible.

Carbon Reduction Opportunities – Construction

Opportunities for areas of carbon reduction in the development's construction phase include:

1. **Materials:** The use of materials with a lower embodied carbon impact (for example, low carbon concrete or recycled steel) would significantly reduce the emissions.

   Examples of low carbon materials include low carbon concretes (75% cement replacement is achievable using GGBS or fly ash substitution), use of recycled steel, or electric arc furnace (EAF) steel with high recycled content, fibre reinforcement for concrete and concrete mix optimization.

   LCA studies[119] comparing Basalt FRP (BFRP) reinforcing bars with steel (100% recycled and standard) were conducted and provided the following conclusions:

   - BFRP bars were shown to have the lowest environmental impact of all considered materials (steel, stainless steel and galvanized steel); the global warming potential of 6mm BFRP bars is 74% lower than that of steel, 22% lower than steel with 100% recycled content, 49% lower than 169 galvanized steel and 88% lower than stainless steel.

   The development at Hunterston will aim to use site locally sourced materials, only importing materials from further afield where necessary. Doing so will minimize emissions associated with A4 lifecycle stage and therefore capital carbon.

2. **Material efficiency:** A design optimization process is needed to ensure only the necessary quantity and type of materials are used. Assessing options to build efficiently and optimising the use of materials needs to occur through design, procurement, and construction phases.
3. **Construction site management:** Sourcing energy efficient plant, regular vehicle maintenance and putting in good practice site procedures (for example, reducing vehicle/plant idling) to make operations more efficient.
4. **Site Waste Management Plan:** Promoting the reduction and effective management of waste during construction, following the waste mitigation hierarchy and relevant national waste reduction policies. This will fall within the Construction Environmental Management Plan that will be produced.

Carbon Reduction Opportunities – Operations

Once the proposed development becomes operational, consideration to measures of emission reduction during the operational phase can follow the Energy Hierarchy. The 'Energy Hierarchy' is a widely adopted method to identify opportunities to reduce energy demand and therefore decrease the related carbon emissions. This hierarchy suggests the use of a four-tiered approach to reducing operational energy consumption, **Be Lean, Be Clean, Be Green and Be Seen** stages.

A brief explanation of each stage of the energy hierarchy is given below:

- **Be Lean**: This stage focuses on being energy efficient. This involves reassessing any architectural layouts of the development based on internal parameters (i.e., daylighting requirement, function of the space, thermal characteristics of the space) and external factors such as surrounding buildings, site morphology, and local weather data.
- **Be Clean**: The second step on the optimization process entails an analysis of the site's available energy sources and the evaluation of alternative technologies to deliver the required energy in the most sustainable way.
  - This will be necessary to meet the national requirements of net zero by 2045**.**
- **Be Green:** The strategy will seek to maximize the provision of low and zero carbon energy capture and generation to meet the remaining demands of the development.
  - As stated in the proposed development description, it is intended that the design of the development will accommodate provision and storage of alternative (less polluting/carbon-free) fuels and provision of shore power to smaller vessels where viable. The proposals for shore power will allow the development to generate renewable energy for onsite use. However, additional consideration of other methods of renewably sourced energy generation is needed for the development to achieve net zero in operations.
- **Be Seen:** The final stage of the process would aim to optimize the performance of the development and verify performance against the design intent through monitoring of consumption. This stage would seek to close any performance gaps and reporting on actual energy performance and lessons learned.

There is great opportunity for methods of carbon management, to be embedded into the design to further reduce the emissions and mitigate the climate change impact, arising from the development of Hunterston Construction Yard. Following the PAS2080 methodology will ensure the most effective process in carbon management is adopted during the construction phase of the development.

Conclusion

[119] Pavlović, A., Donchev, T., Petkova, D. and Staletović. 2022. Sustainability of alternative reinforcement for concrete structures: Life cycle assessment of basalt FRP bars. *Construction and Building Materials* Available at: https://www.sciencedirect.com/science/article/pii/S0950061822011011#kg005

The total capital carbon of the construction, capital and maintenance (dredging) of the development was **250,975 tCO_2e.** Strategies to mitigate the capital carbon impact of the development should focus on *Earthworks* and *Concrete Ancillaries*, as these elements represent the greatest opportunity for emission reductions with a combined emission total of **220,174 tCO_2e** (88% of the total capital carbon.)

Strategies could include:

- Low/zero carbon sources of steel to reduce the impact of formwork and reinforcement.
- Reducing the required imported material to site, keeping as much material in situ as possible to reduce the impact of the excavation and transport of dredged material.
- Consider if a modal shift to an electric mode of transport can be facilitated (electrified rail has lower emissions per ton/km in comparison to sea shipping).

Whilst the lifetime operations of the development are beyond the scope of this assessment, consideration should be given to how optimisation strategies implemented during construction can facilitate further optimisation strategies during operation and decommissioning. A whole system approach involving multiple stakeholders can often lead to the greatest emission reductions.

14 SCHEDULE OF MITIGATION

14.1 Introduction

This Chapter presents a summary of the mitigation and enhancement measures identified by the specialist environmental studies throughout the EIA process. It indicates how these mitigation measures have or would be implemented. In addition to summarising mitigation, enhancement measures identified in the topic specific Chapters of this EIAR are also highlighted.

The mitigation and enhancement measures included in this EIAR would be implemented during one or more of the following two broad phases of the proposed development:

- Measures incorporated during the design process; and
- Measures required through the construction phase; and

Table 14-1 below provides a summary of the mitigation measures proposed for each issue identified by the EIA process. The measures are divided into the categories outlined above. It should be noted that the table presents a summary only; further details on the mitigation and enhancement measures are included within each Chapter of this EIAR.

The Schedule is designed to provide a comprehensive summary of all construction or physical mitigation measures that would require to be carried through into the construction and operation of the proposed development, to ensure that the environmental assessment outcomes discussed throughout this EIAR are reached, e.g. to ensure that significant adverse effects are avoided where applicable and possible.

14.2 Mitigation Measures

Mitigation detailed in each technical chapter has been summarised below.

Table 14-1: Schedule of Mitigation

Feature / Topic	Mitigation	Timing
General		
Construction Environmental Management Plan	A Construction Environmental Management Plan (CEMP) will be developed to ensure that the mitigation measures outlined in the EIA are followed during the proposed construction works. The CEMP will include surface water management and pollution prevention measures (e.g. Pollution Prevention Plan), and will be in place during construction and operation. The CEMP will remain a live document and will be continually updated as the work progresses. The CEMP will be developed as a practical tool to facilitate the management of environmental mitigation measures and to provide a clear roadmap of the key roles and responsibilities during construction. All mitigation measures will be incorporated into the CEMP, which will include detailed Construction Method Statements (CMS). An Environmental Clerk of Works (EnvCoW) will monitor the construction works to ensure that the CEMP and associated mitigation measures are being implemented effectively.	Construction
Best Practice	Best practice will be adopted throughout all phases of development, following current guidance as listed in this EIAR. The programme of works, including timings and methods, will be planned, monitored and managed to minimise the potential negative environmental impacts.	Construction
Pollution Incident Response Plan	A Pollution Incident Response Plan will be set out in the CEMP relating to the construction of the proposed development, statutory requirements and identification of areas of highest sensitivity. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times.	Construction
Vessel Movements and Navigational	All of the risks should be kept under review by Clydeport as the development progresses	Construction
Chapter 5: Biodiversity		
Construction Environmental Management Plan	Prior to works commencing on site (including any site clearance or preparatory works) a Construction Environment Management Plan (CEMP) detailing site specific mitigation and monitoring will be agreed with the Local Planning Authority and implemented to avoid and reduce negative impacts.	Construction
Environmental Advisor	An Environmental Advisor/Manager will be employed to design and implement on site mitigation strategies as they are required.	Construction
ECoW	An independent Ecological/Environmental Clerk of Works (ECoW) will be employed to audit and report on adherence to the CEMP as well as any other relevant planning consents, environmental permits, legislation and mitigation.	Construction
OCoW	An Ornithological Clerk of Works (OCoW) to undertake disturbance monitoring during the construction phase, particularly during potential sensitive activities such as piling on the eastern side of the marine yard and access road resurfacing works.	Construction
MMPP	A Marine Mammal Protection Plan as detailed in Technical Appendix 5.6 will be implemented to reduce the risk of underwater noise causing injury to marine mammals (and basking shark). This will involve the use of MMOs. The MMPP also details protocols to be implemented to reduce collision risk.	Construction
Biosecurity	A site specific biosecurity plan has been produced for the proposed development and is provided as Technical Appendix 5.5. This is a working document and will be updated to reflect development in the site operation, use and knowledge with respect to marine non-native invasive species.	Construction
Good Practice	The following good practice guidelines shall be adhered to and incorporated into the CEMP: • GGP 5: Works and maintenance in or near water; • PPG 6: Working at construction and demolition sites; • PPG 7: Safe Storage – The safe operation of refuelling facilities; • GPP 21: Pollution and incident response planning; and • PPG 22: Incident response – dealing with spills.	Construction
Toolbox Talks	All personal on the site should be made aware of the environmental sensitivities of the site (proximity to designated sites) via the site induction and additional task specific toolbox talks as required.	Construction
Disturbance	A speed limit of 15mph to be in place along the access road to the marine yard.	Construction
Disturbance	Any artificial lighting required during construction will be fitted with directional shades and will not illuminate habitats outside of the immediate works area.	Construction
Enhancement	Loss of OMHPDL will be compensated for via the enhancement and creation of habitats described in section 5.8.4.	Construction
Biosecurity	The biosecurity plan provided in Technical Appendix 5.5 will be adhered to and reviewed at regular intervals in line with operational needs and available data on mINNS present.	Operation
Disturbance	A speed limit of 15mph to be in place along the access road to the marine yard.	Operation
Navigation	Vessels will adhere to the protocols presented within the MMPP in Technical Appendix 5.6 in relation to avoiding collision with marine mammals and fish.	Operation
Lighting	Permanent lighting will be fitted with shades to reduce light spill to habitats within the Southannan Sands SSSI.	Operation
Chapter 6: Seascape, landscape and Visual Impact Assessment		
Seascape and landscape design suggestions	The land and sea clearance and occupation will be limited to the minimum necessary for the works.	Construction

Feature / Topic	Mitigation	Timing
Construction lighting	The construction lighting will be controlled during darkness hours, so it does not impinge into sensitive views, for example from residential windows.	Construction
Construction safety signs	It would be ensured that the temporary warning signs and other road safety management measures on public roads are established in an orderly and well organised manner so that the necessary safety management objectives are achieved with minimal landscape intrusion.	Construction
Construction material	The temporary construction materials would be removed from the application site once work is completed.	Construction
Regular maintenance	Regular maintenance of working compounds would be undertaken to ensure that they are kept tidy and contained, with mud etc. controlled upon public roads.	Construction
Enhancement opportunity	Measures may be taken to plant small trees or shrubs along the existing access road.	Construction
Chapter 7: Terrestrial Noise		
Dredging	The assessment has not identified any significant noise impacts associated with dredging utilising a trailer suction hopper dredger during daytime or nighttime. Should the proposed development incorporate use of a backhoe dredger then this should be scheduled so that works undertaken during the night are limited to a working area within 350m of the existing quay wall to mitigate noise impacts to receptors on Great Cumbrae.	Construction
CNMP	A Construction Noise Management Plan (CNMP), as a part of CEMP would be prepared to minimise any potential significant impacts associated with construction noise.	Construction
Chapter 9: Coastal Processes		
Construction Environmental Management Plan	A Construction Environmental Management Plan (CEMP) will be developed to ensure that the mitigation measures outlined in the EIAR are followed during the proposed construction works. The CEMP includes surface water management and pollution prevention measures (e.g. Pollution Prevention Plan) and will be in place during construction and operation.	Construction and Operation
EnvCoW	A suitably qualified Environmental Clerk of Works (EnvCoW) will monitor the construction works to ensure that the CEMP and associated mitigation measures are being implemented effectively.	Construction
Pollution Incident Response Plan	A Pollution Incident Response Plan will be developed relating to the construction of the proposed development, statutory requirements and identification of areas of highest sensitivity. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All staff will be made aware of this document and its content during site induction. A copy will be available in the site office at all times.	Construction and Operation
CAR	All activities above Mean High Water Springs (MHWS) with potential to affect the water environment require to be authorised under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR). The level of authorisation required is dependent on the anticipated environmental risk posed by the activity to be carried out and the regulator will set specific discharge consent parameters in relation to protection of the environment.	Construction and Operation
Dewatering	Mitigation measures will be delivered by the principal contractor through detailed Construction Environment Management Plans (CEMPs) that will be produced following appointment. The location of the dewatering outfall will also be chosen to avoid sensitive areas and have minimal impact on the coastal environment. The discharge will be regulated by SEPA under the Controlled Activities Regulation which will detail the specific quality parameters which the discharge will require to meet. Specific water processing measures may be required to meet these discharge parameters.	Construction
Concrete	In the case that concrete batching was to be undertaken on-site the following mitigation measures would be implemented to minimise the potential impact of concrete batching on the water environment in line with GPP6: • Concrete batching will take place on an impermeable designated area and at least 10m from any waterbody. • Equipment and vehicles will be washed out in a designated area that has been specifically designed to contain wet concrete/ wash water. • A closed loop system will be used for wash waters. Wash waters will be stored in a contained lined pond for settlement before being reused (e.g. for mixing and washing). • No discharge of wash waters will occur on-site. All excess wash water that cannot be reused will be disposed of off-site. The following mitigation is proposed for concrete handling and placement: • Pouring of concrete will take place within well shuttered pours to prevent egress of concrete from the pour area; • Pouring of concrete during adverse weather conditions will be avoided. • Concrete acidity (pH) will be as close to neutral (or site-specific pH) as practicable as a further precaution against spills or leakage.	Construction
Oil Storage	The storage of oil is considered a Controlled Activity which will be deemed to be authorised if it complies with the Regulations. The mitigation measures to minimise any risk of contaminant release are in line with SEPA GPP and PPG documents and include the following: Storage: • Storage for oil and fuels on site will be designed to be compliant with GPP2 and GPP8; • The storage and use of loose drums of fuel on site will not be permitted; and • Bunded tanks will provide storage of at least 110% of the tank's maximum capacity. Refuelling and maintenance:	Construction and Operation

Feature / Topic	Mitigation	Timing
	• Fuelling and maintenance of vehicles and machinery, and cleaning of tools, will be carried out in a designated area where possible in line with PPG7; • Multiple spill kits will be kept on site; • Drip trays will be used while refuelling; and • Regular inspection and maintenance of vehicles, tanks and bunds will be undertaken.	
OEMD	An Operational Environmental Management Document (OEMD) will be in place throughout the operational phase. Best practice will be followed throughout the operational phase, with reference to the SEPA Guidance for Pollution Prevention (GPPs), and best practice guidance.	Operation
Drainage	It is proposed that drainage of surface water will adopt SuDS principles and be by means of infiltration through a permeable surface, and the underlying permeable reclamation fill, providing treatment. Details of the operational surface water management proposals and methodology will be included within the OEMD and will be submitted to SEPA's operations team for agreement consent. Plans of the surface water management system will be located within the Site office, with foul water systems clearly marked. Where a site use or development proposal is such that it will require a Pollution Prevention and Control (PPC) authorisation from SEPA, then specific processes, techniques and technologies will be included within the surface water management system in that location in order to meet the requirements of the PPC authorisation. Such measures would be in line with best practice guidance.	Operation
Monitoring	The Applicant shall undertake a planned programme of compliance monitoring to verify the effectiveness of the project's environmental management. Monitoring plans will be established and implemented with the agreement of North Ayrshire Council, SEPA, NatureScot and Marine Scotland. Specific auditing and monitoring plans will be developed by the contractor and will cover the following: • The contractor's own Environmental Management System; • The CEMD, schedule of mitigation register, relevant legislation and industry good practice; • All project activity; • Roles and responsibilities for those undertaking audits and monitoring; • Frequency of inspection activities (i.e. daily, weekly, monthly); • Process to deal with corrective actions/non-compliance; and • Reporting procedures (including non-compliance).	Operation
Chapter 10: Socioeconomics and Human Health		
Construction Management Plan	A management plan (construction management plan and during operation) will be maintained to minimises any risk of crime on the site and ensures cycle ways and footpaths nearby are not interrupted.	Construction
Apprenticeship	Local apprenticeships would be encouraged, wherever possible.	Construction
Considerate Constructors Scheme	The company would sign up to the Considerate Constructors Scheme of the West Kilbride Community Council.	Construction
Chapter 11: Accidents and Natural Disaster		
Extreme weather events	The works programme for the construction stage of the development will take account of weather forecasts and work will be suspended in the case of extreme weather events.	Construction
Health and Safety	During the development of the project, The Construction (Design and Management) Regulations (CDM Regulations) would be followed to ensure that health and safety issues are properly considered, with a strong focus on managing risks and ensuring health and safety.	Construction
SOPs	Standard operational procedures and protocols will be implemented to reduce the risk of major accident / disaster during operation.	Operational
Licenses and Permits	All the applicable permits and licenses such as Pollution Prevention and Control permits, Car Licence (under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) etc. would be procured and relevant routine monitoring and statutory reporting will be undertaken.	Operational
Chapter 12: Navigation		
Vessel Traffic Management (VTM) Review	A Vessel Traffic Management review will be conducted by. PePG to review the provision of VTM, specifically with consideration to their LPS resource to monitor marine construction/ dredge craft as well as future marine activity during the operational phase.	Construction and Operation
Project Liaison Officer and Marine Management Plan	Appointing a Project Liaison Officer and developing a Marine Management Plan will ensure effective communication and coordination among stakeholders. This proactive approach will help identify and address potential risks in real time.	Construction and Operation
Contractor Risk Assessment	Requiring contractors to submit detailed Risk Assessment Method Statements will ensure that all construction risks are identified and managed effectively before work commences, reducing the likelihood of incidents.	Construction and Operation

Feature / Topic	Mitigation	Timing
Method Statement (RAMS)		
Education	Providing education and training sessions for personnel involved in recreational navigation and will enhance awareness of safety protocols and best practices, fostering a safety-conscious culture.	Construction and Operation
Clyde Leisure Navigation Guide	Updating and disseminating the Clyde Leisure Navigation Guide will inform recreational vessels users of recommended routes and safety precautions, reducing the risk of collisions and navigational incidents.	Construction and Operation
AtoN Review	Conducting regular reviews of Aids to Navigation (AtoN) will ensure that these markers remain effective and accurate, enhancing navigational safety.	Construction and Operation
Leisure Vessel Recommended Routes	Establishing recommended routes for leisure vessels will minimize interference with commercial traffic and reduce the risk of accidents in high-traffic areas.	Construction and Operation
Review Clydeport Towage Guidelines and Pilotage Directions	Regularly reviewing and updating towage guidelines and pilotage directions will ensure that vessels receive appropriate assistance in challenging navigation areas, reducing the risk of incidents.	Construction and Operation
Notice to Mariners	Issuing regular Notices to Mariners will keep stakeholders informed of changes and hazards in the area, promoting safer navigation practices, especially during the construction phase.	Construction and Operation
Safety Boat	Deploying a safety boat during the construction phase will provide immediate response capabilities in case of emergencies or incidents on the water.	Construction and Operation
Adherence to CDM Regulations	Adhering to the Construction (Design and Management) Regulations (CDM) will ensure that safety considerations are integrated into the project design and execution.	Construction and Operation
Flow Monitoring	Continuous monitoring of vessel traffic flows will enable proactive management of congestion and risks associated with navigation.	Construction and Operation
Prior Notice of Dredge Campaign	Providing prior notice of dredging activities to mariners will mitigate risks associated with changes to navigation channels and the risk of collision in confined waters.	Construction and Operation
Simulation	Conducting simulation exercises for navigation and port operations will allow for the testing of emergency response plans and identification of potential weaknesses in planned operations.	Construction and Operation
Emergency (Controlled) Vessel Departure	Implementing protocols for controlled emergency vessel departures will ensure swift response capabilities during critical situations, such as if winds are too excessive to remain berthed safely alongside.	Construction and Operation
Port Emergency Plan	Developing and implementing a Port Emergency Plan will establish clear procedures and responsibilities for responding to emergencies effectively.	Construction and Operation
PPG Quayside Audits and Inspections	Regular audits and inspections of quaysides in accordance with Pollution Prevention Guidelines (PPG) will maintain safety standards and prevent environmental hazards as well as help prevent trips slips and falls.	Construction and Operation
Review Mooring and Berthing Guidelines	Reviewing and updating mooring and berthing guidelines will enhance safety during docking and departure operations.	Construction and Operation
Safety Area	Designating safety areas on the quayside will help provide a visual indication to workers as to where it may be unsafe to stand unless actively engaged in activities such as mooring a vessel.	Construction and Operation
Storm Moorings	Using storm moorings (usually made from steel wire) will secure vessels during severe weather events, reducing the risk of damage or accidents.	Construction and Operation

14.3 Construction Environmental Management Plan

An overarching Construction Environmental Management (CEM) Document has been compiled and provided in Technical Appendix 14.1, Volume 3 of this EIAR. This document has been produced in accordance with The Highland Council Guidance Note on Construction Environmental Management Process for Large Scale Projects (August 2010). This Guidance Note sets out a robust Project Environmental Management Process (PEMP) for large scale projects. It describes the CEM Document as one of the key management tools for highlighting site sensitivities along with defining appropriate mitigation measures identified during the EIAR process (as summarised in the Schedule of Mitigation) as well as incorporating other requirements from consents and licences. It also provides a clear roadmap of the key roles and responsibilities of all those involved during construction works.

The information and procedures provided in this CEM Document shall be used to develop detailed Construction Environmental Management Plans (CEM Plans) for each specific construction phase. These CEM Plans shall provide focused mitigation and control measures relevant to the specific construction activity in order to ensure the environment is protected during the construction works. The CEM Plans shall incorporate, but not be limited to, the identified mitigation measures detailed within the Schedule of Mitigation. If the proposed construction works are within or have a significant likelihood of impacting on sensitive areas, the CEM Plan's shall be submitted to the relevant Regulatory Authority (i.e. NAC and / or MD-LOT) for approval prior to works commencing.

The CEM Plans are working documents which shall be regularly reviewed and updated throughout the lifetime of the individual construction project in accordance with the procedures detailed in the CEM Document and the relevant consents.

15 SUMMARY OF EFFECTS

15.1 Introduction

The predicted environmental effects related to the construction works to modernise HCY have been considered throughout the design and subsequent assessment of the proposed development. The views of statutory consultees have been taken into account as presented in Chapter 4: EIA Methodology and Consultation.

The final design of the proposed development has been subject to a detailed EIA and design iteration process which has sought to minimise the effects resulting from the proposed development whilst ensuring the maximum benefits to the environment, nearby communities, and future generations. Where appropriate, additional mitigation measures have been proposed as well as opportunities for enhancement. Both mitigation and enhancement measures are detailed within their respective specific chapters and summarised within Chapter 14: Schedule of Mitigation of this EIAR.

The conclusions of each chapter are provided below.

15.2 Biodiversity

Chapter 5 Biodiversity considered the impacts of the development on the ecology of both the terrestrial and marine environments. A number of specialist ecological studies were undertaken to inform the impact assessment. A number of Important Ecological Feature's (IEF's) considered in the Chapter were assessed as having a negligible magnitude prior to mitigation measures being implement apart from:-

- Southannan Sands SSSI was deemed to have a negligible to moderate magnitude of impact during the construction and operational phases with a negligible to high sensitivity for both phases.
- Loss of terrestrial habitat has a major magnitude of impact for the construction phase only. The receptor is identified as being of high sensitivity;
- Otters were deemed to have a low magnitude of impact during construction and operational phases with low sensitivity for both phases.
- Wintering birds were deemed to have a low magnitude of impact during construction and operational phases with low sensitivity for both phases.
- Seagrass beds were deemed to have low to have negligible to moderate impact during construction and operational phases with negligible to high sensitivity for both phases.
- Blue mussel beds were deemed to have low to have negligible to moderate impact during construction and operational phases with negligible to medium sensitivity for both phases.
- Seals were deemed to have low to have negligible to low impact during construction and operational phases with low sensitivity for both phases.
- Harbour porpoise and Minke whale were both deemed to have a negligible to moderate magnitude of impact during construction and a negligible to low magnitude of impact during operation with low sensitivity for both phases.
- Diadromous fish were deemed to have a low magnitude of impact during construction phase only with a negligible to medium sensitivity.
- Basking sharks were deemed to have a low magnitude of impact during construction phase only with a negligible to low sensitivity.

Cumulative impacts on Biodiversity were identified during the construction phase of this development and the construction of the Bakkafrost smolt facility and the construction/decommissioning of the Fastrig Wing Sail Test Facility Yard should these phases occur concurrently or sequentially.

This development and the Bakkafrost smolt facility are predicted to have cumulative impacts during the operational phases. The magnitude of impacts are considered to be of low – negligible magnitude and impact a small area of the relative IEFs range for both projects. However alterations to the overall conservation status of the features is not considered likely.

With suitable mitigation measures identified and in place, the residual effects for the IEF's are subsequently reduced to negligible in their magnitude and therefore not significant for both the construction and operational phases apart from the terrestrial habitat under the development footprint. This is considered to be significant at site level only. A derogation licence will be required for disturbance to cetaceans and basking sharks during the construction phase. Biodiversity enhancements are also identified which should provide benefits to the local biodiversity, creating habitats suitable for a variety of floral and faunal terrestrial. A monitoring programme to verify the effectiveness of the mitigation measures proposed is provided in the Chapter. Overall, the effects of the proposed development on Biodiversity are considered not significant.

15.3 Seascape, Landscape and Visual Impact Assessment

Chapter 6 has assessed that significant seascape, landscape and visual effects resulting from the proposed development would be contained within a very localised area around the application site, with significant seascape and landscape character, and visual amenity effects assessed as occurring within distances of up to ~3km from the proposed development (depending on the presence of intermittent urban and industrial built form, transport corridors, and tree and vegetation cover).

The localised presence of settlement and large-scale infrastructure elements on the fringes of the surrounding urban landscapes diminishes the potential for significant effects from the surrounding seascape and landscape environments by limiting/restricting visibility of the proposed construction works and activities, and associated operational infrastructure, or assisting with their visual integration.

In certain views in proximity of the application site, the increased volume of construction works, activities and shipping/vehicle movements would be apparent (principally from the Hunterston estate, Great Cumbrae Island, and Little Cumbrae Island). The temporary presence of taller elements such as high mast lighting columns, cranage, and cargo movements from larger ships would also present a noticeable contrast in scale with existing elements, particularly when viewed at close distances, when their presence would be amplified by their closer proximity to the viewer. In contrast, natural perspective would aid the viewers perception of scale difference from more distant locations, particularly in instances when the taller elements would accord with existing urban and industrial built form and vertical structures against the sky.

When considering the operational cumulative context, the addition of the proposed development would only slightly increase the presence of construction works and activities in the immediately surrounding landscape.

When considering the consented and planning application stage cumulative scenarios, construction works and activities undertaking for the other planning application stage developments delivered as part of the Hunterston PARC masterplan would influence the extent of cumulative effects.

Given the proximity of all the planning application stage developments under consideration, the significant effects identified in the SLVIA are considered to occur as a result of the proposed development in its own right (i.e., introduced to the 'host' CCA, LCT or proximity views) and cumulatively with the baseline and planning application stage scenarios.

Whilst the results of this SLVIA have assessed that the proposed development would result in significant seascape, landscape and visual effects the works are not considered to reach unacceptable levels, particularly when considering the type of construction works and activities required to modernise the site into a facility suitable for use by the offshore renewable industries.

15.4 Terrestrial Noise

Chapter 7 details the Terrestrial Noise Assessment for the proposed development.

Neutral impacts has been predicted at all of the surrounding residential receptors as a result of all construction phases during the daytime and evening periods for weekdays and weekends.

During the night-time period, Marine Parade, Cumbrae is predicted to be subject to a 3dB excess above the threshold level of 45 dB, resulting in a Moderate Adverse Significance of Impact due to dredging which has been assumed to be occurring at the closest possible point to this receptor using the backhoe method which generates significantly more noise than the cutter suction method. Employing trailing suction hopper dredging at this location results in a neutral Significance of Impact.

In accordance with the guidance provided in the Technical Advice Note (TAN) 1/2011, “These effects, if adverse, while important, are not likely to be key decision making issues.”

15.5 Traffic Assessment

Chapter 8 details the Traffic Assessment. In terms of traffic impacts, the maximum of 11% uplift in HGV movements is expected to be experienced on the A78 (N) but the overall impact of construction vehicles is relatively low on the A78 in terms of AADT.

The impact on Severance is considered to be insignificant considering the fact that the construction traffic will arrive at the site using the A78 on the trunk road network and there are no residential areas on the route to the site or within the vicinity of the site. Also, the existing pedestrians and cyclists using Power Station Road should not be affected due to low level of traffic generated during the construction phase, on that route.

Given the low level of construction traffic generation, the potential impact on Driver Delay on the surrounding road network, Non-motorised User Delay, Non-motorised User Amenity is considered to be insignificant.

The level of fear and intimidation is currently moderate and there will be no change in the level of fear and intimidation on the A78 due to the low level of construction traffic and Oilrig Road. Re-opening Power Station Road / Oilrig Road (site access) to traffic may increase the level of fear and intimidation on this road, however, due to the low level of construction traffic expected, the impact on fear and intimidation will likely be negligible.

In terms of road safety, there are no historical road safety issues associated with the road network surrounding the development.

It is not anticipated that there will be any hazardous load / large load vehicle movements associated with the development. Therefore, the impact will be insignificant.

15.6 Water Environment and Coastal Processes

Chapter 9 details the Water Environment and Coastal Processes Assessment for the proposed development.

The baseline assessment identified the sensitive receptors to potential impacts on the water environment, soils and coastal processes as the coastal waters and sediment of the proposed development (and immediate surrounds), the waters of the wider Firth of Clyde, the Southannan Sands SSSI site which bounds the proposed site to north, east and south, the Kames Bay and Ballochmartin Bay SSSIs, and the Hunterston B cooling water intake.

The potential impacts on the water environment and coastal processes addressed within the assessment include:

- Hydrological alteration including increased runoff and alteration of flow patterns;
- Contamination of coastal waters, sediment and SSSI Southannan Sands through spillages, leakages and sediment transfer (oils, fuels, welfare facilities and suspended solids;
- Changes in local wave climate;
- Changes in local tidal regime;
- Changes in local sediment transport regime;
- Associated impacts on the intertidal habitat of SSSIs; and
- Associated impacts to Hunterston B, in particular the cold-water intake.

The potential interaction between the water environment impacts and ecology, including in relation to the Southannan Sands SSSI, are assessed within Chapter 5, Biodiversity.

The assessment has been supported by a coastal modelling study (Technical Appendix 9.1), which has included hydrodynamic, spectral wave and dredge plume dispersal modelling. Impacts arising from both the construction phase and operational phase have been considered within the assessment.

The magnitude of identified impacts prior to mitigation range from Negligible to High. Once mitigation is applied the magnitude of identified impacts are Negligible. The residual effects are therefore considered to be Negligible. Accordingly, no significant effects on the water environment or coastal processes have been identified.

15.7 Socioeconomic and Human Health

The socioeconomic and human health assessment is detailed in Chapter 10.

The assessment considered potential impact to the following receptors;

- Future employees
- Supply chain, Other businesses in the area
- Recreational users, Tourist accommodation, Local residents, Marine users
- Local residents, local road users
- Local residents, future employees
- Local residents, Community Council etc

The assessment identified negligible effects to the receptors as a result of the proposed development with the exception of a positive impact to Future Employees as result of job creation in the area as there is none on the Construction Yard Site presently. This was identified as positive impact with minor significance.

There are no negative residual effects associated with the socio-economic assessment and population & human health assessment.

15.8 Accidents and Natural Disasters

Chapter 11 details the Accidents and Natural Disasters Assessment. The assessment concluded that none of the potential risks to be noted during the construction and operational phase were identified as requiring further assessment.

On the basis of the assessment, adoption of the proposed mitigation approaches throughout this EIAR and adherence to best working practices during construction and operation of the site, there is not considered to be significant impacts associated with Accidents and Natural Disasters.

15.9 Navigation

Chapter 12 details the potential marine safety impacts resulting from the proposed HCY development on the existing navigational environment, the assessment concluded that none of the risks presented in the NRA have resulted in an outcome that is ‘intolerable’ during construction or operational phase.

Three scenario’s, collision of recreational vessel with capital dredge plant, jack up barge spud leg failure and collision of recreational vessel with maintenance dredger result in a Moderate or Large Significance at the embedded stage, however with the future control mitigations, the significance is reduced to slight.

On the basis of the assessment, it is concluded that after future control mitigation is applied, the construction and operational marine activities for HCY will have Slight to Neutral impact and it is not considered to be significant impacts.

15.10 Supporting Assessments

Chapter 13: Supporting Assessments, covers topics including Air Quality, Carbon, Climate Change and Greenhouse Gas Emissions Assessment and Material Assets and Waste. None of these aspects are considered significant in terms of the EIA Regulations

16 GLOSSARY

A&ND	Accidents and Natural Disasters
AADT	Annual Average Daily Traffic
ACD	Admiralty Chart Datum
ACM	Asbestos Containing Materials
AGR	Advanced Gas-Cooled Reactors
AILs	Abnormal Indivisible Loads
AIS	Automatic Identification System
ALARP	As low as reasonably practicable
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
ATC	Automatic Traffic Count
AtoN	Aids to Navigation
BEMP	Biodiversity Enhancement and Management Plan
BFRP	Basalt Fiber Reinforced Polymers
BGS	British Geological Survey
BNG	Biodiversity Net Gain
BPEO	Best Practicable Environmental Option
CAR	Controlled Activities Regulations
CCA	Coastal Character Areas
CCTV	Closed-Circuit Television
CCUS	Carbon Capture Utilisation and Storage
CD	Chart Datum
CDM	Construction (Design and Management)
CDMP	Construction Dust Management Plan
CDRA	Construction Dust Risk Assessment
CEM	Construction Environmental Management
CEMD	Construction Environmental Management Document
CEMP	Construction Environmental Management Plan
CFB	Coastal Flood Boundary
CGNS	Celtic and Greater North Seas
CHA	Competent Harbour Authority
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CLP	Classification, Labelling and Packaging
CMPP	Clyde Marine Planning Partnership
CMS	Construction Method Statements
CNIA	Construction Noise Impact Assessment
CNMP	Construction Noise Management Plan
COMAH	Control of Major Accident Hazards
COP	Conference of the Parties
COPD	Chronic Obstructive Pulmonary Disease
dB	Decibel
DEFRA	Department for Environment, Food & Rural Affairs
DEPZ	Detailed Emergency Planning Zones
DSEAR	Dangerous Substances and Explosive Atmospheres Regulations
DWPF	Decommissioning Waste Processing Facility
EA	Environment Agency
EAF	Electric Arc Furnace
EATM	Environmental Assessment of Traffic and Movement
EC	EC habitat
ECIA	Ecological Impact Assessment
ECoW	Ecological/Environmental Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMS	Environmental Management System
EnvCoW	Environmental Clerk of Works
EPS	European Protected Species
EUNIS	European Nature Information System
FIT	Flower-Insect Timed
FSA	Formal Safety Assessment
FTE	Full Time Employment
GBS	Gravity-Based Structures
GDL	Garden and Designed Landscape
GGBS	Ground Granulated Blast-furnace Slag
GHG	Greenhouse Gases
GLVIA3	Guidelines for Landscape and Visual Impact Assessment
GPCC	Group Port Control Centre
GPP	Guidance for Pollution Prevention
GtGP	Guide to Good Practice
GVA	Gross Value Added
Ha	Hectares
HAZID	Hazard Identification
HCY	Hunterston Construction Yard
HES	Historic Environment Scotland
HGV	Heavy Good Vehicles
HIE	Highlands and Islands Enterprise
HNA	Hunterston Nuclear A
HNB	Hunterston Nuclear B
HOM	Head of Maritime
HRA	Health Risk Assessment
HWDT	Hebridean Whale and Dolphin Trust
ICE	Inventory of Carbon and Energy
IECS	Institute of Estuarine and Coastal Studies
IEF	Important Ecological Features
IEMA	Institute of Environmental Management and Assessment
ILWS	Intermediate Level Waste Store
IMDG	The International Maritime Dangerous Goods
IMO	International Maritime Organization
INCA	Industry Nature Conservation Association
INNS	Invasive Non-Native Species
IPCC	Intergovernmental Panel on Climate Change
ISPS	International Ship and Port Security
IUCN	International Union for the Conservation of Nature
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LCA	Life Cycle Assessment
LCT	Landscape Character Types
LDP	Local Development Plan
LLA	Local Lighthouse Authority
LOA	Letter of Authorization
LPS	Local Port Service
LUPS	Land Use Planning System
LVIA	landscape and visual impact assessment

M&CA	Maritime and Coastguard Agency
MAIB	Maritime Accident and Investigation Branch
mAOD	meters Above Ordnance Datum
Marlin	Marine Life Information Network
MAU	Marine Analytical Unit
MCA	Marine Consultation Area
MCCIP	Marine Climate Change Impacts Partnership
MCZ	Marine Consultation Zone
MHWS	Mean High Water Springs
mINNS	marine invasive non-native species
MLWS	Mean Low Water Springs
MMO	Marine Mammal Observer
MMPP	Marine Mammal Protection Plan
MOD	Ministry of Defence
MPA	Marine Protected Areas
MPS	Marine Policy Statement
MSMS	Marine Safety Management System
MU	Management Unit
NAC	North Ayrshire Council
NDA	Nuclear Decommissioning Authority
NDC	Nationally Determined Contribution
NMPi	National Marine Plan interactive
NNSS	Non-Native Species Secretariat
NPF3	National Planning Framework 3
NPF4	National Planning Framework 4
NRA	Navigational Risk Assessment
N-RIP	National Renewables Infrastructure Plan
NRR	National Risk Register
NS	NatureScot
NSA	National Scenic Areas
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
OEMD	Operational Environmental Management Document
OHMP	Outline Habitat Management Plan
OMHPDL	Open Mosaic Habitat on Previously Developed Land
ONR	Office for Nuclear Regulation
OWPF	Operational Waste Processing Facility
PAB	Planning Application Boundary
PAC	Pre-Application Consultation
PAH	Polycyclic Aromatic Hydrocarbon
PAN	Planning Advice Note
PARC	Port and Resource Campus
PCB	Polychlorinated biphenyls
PCC	Pollution Prevention and Control
PEA	Preliminary Ecological Appraisal
PEMP	Project Environmental Management Process
PePG	Peel Ports Group
PMF	Priority Marine Features
PMSC	Port Marine Safety Code
PoAN	Proposal of Application Notice
PPC	Pollution Prevention and Control
PPG	Pollution Prevention Guidance
PPP	Pollution Prevention Plan
PTS	Permanent Threshold Shift
PWS	Private Water Supply
RAL	Revised Action Level
RAMS	Risk Assessments and Method Statements
RAS	Recirculating Aquaculture System
RBMP	River Basin Management Plan
RCP	Representative Concentration Pathway
RICS	Royal Institution of Chartered Surveyors
RIFE	Radioactivity in food and the environment
RNLI	Royal National Lifeboat Institution
RP	Return Period
RSPB	The Royal Society for the Protection of Birds
RVAA	Residential Visual Amenity Assessment
RYA	Royal Yachting Association
SAC	Special Areas of Conservation
SBL	Scottish Biodiversity List
SDG	Sustainable Development Goals
SEIA	Socio-economic impacts
SEPA	Scottish Environment Protection Agency
SGMD	Scottish Government’s Marine Directorate
SHA	Statutory Harbour Authority
SILWE	Solid Intermediate Level Waste Encapsulation plant
SLA	Special Landscape Area
SLVIA	Seascape, Landscape, Visual, Impact Assessment
SMASS	Scottish Marine Animal Stranding Scheme
SMS	Safety Management System
SMU	Seal Management Unit
SNH	Scottish Natural Heritage
SPA	Special Protected Areas
SPP	Scottish Planning Policy
SSC	Sedimentation Levels, Turbidity
SSSI	Sites of Special Scientific Interest
SUDS	Sustainable Urban Drainage Systems
SWF	Sea Watch Foundation
SWMP	Site Waste Management Plan
SWSEIC	Southwest Scotland Environmental Information Centre
TAN	Technical Advice Note
TS	Transport Scotland
TSS	Total Suspended Sediment
TTS	Temporary Threshold Shift
UKCP	UK Climate Projections
UNESCO	The United Nations Educational, Scientific and Cultural Organization
VHF	Very High Frequency
VTM	Vessel Traffic Management
WCA	Wildlife and Countryside Act
WeBS	Wetland Bird Surveys
WFD	Water Framework Directive
WILWREP	Wet Intermediate Level Waste Retrieval and Encapsulation Plant
WLAs	Areas of Wild Land
WML	Waste Management License
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility