Volume 2: Environmental Impact Assessment Report

Former Fabrication Yard
Ardersier

On behalf of **Ardersier Port Ltd**

Date of Report: **September 2018**
Our Ref: KMcG/2017/11/0234

Contents

Glossary

Applicant	Ardersier Port Ltd.
Application Site	The area within the red line Planning Boundary.
Baseline	The existing conditions which form the basis or start point of an environmental assessment.
Bathymetry	The study of sea floors/beds of water bodies.
Biodiversity	The existence of a wide variety of plant and animal species living in their natural environment.
Biodiversity Action Plan (BAP)	Sets objectives and measurable targets for the conservation of biodiversity.
Best Practicable Means (BPM)	BPM is a term used by the Environment Agency (EA) and Scottish Environment Protection Agency (SEPA). It requires operators to take all reasonable practicable measures in the design and operational management of their facilities to minimise pollutants, so as to achieve a high standard of protection for the public and the environment.
British Standard	The specification of recommended procedure, quality of output, terminology, and other details, in a particular field, drawn up and published by the British Standards Institution.
Construction Environmental Management Document (CEMD)	Establishes a set of site specific procedures capable of meeting statutory requirements with respect to the management of construction activities throughout a site.
Council	The Highland Council.
Decibel (dB)	The unit of measurement used for sound pressure levels and noise levels.
Ecosystem	An ecosystem is a community made up of living organisms and non-living components such as air, water, and mineral soil.
Effect	The result of change on a specific environmental resource or receptor.
Environmental Impact Assessment (EIA)	The systematic process by which information about the environmental effects of a proposal are evaluated and mitigation measures identified.
EIA Regulations 2017	Town and Country Planning (EIA)(Scotland) Regulations 2017 and Marine Works (EIA)(Scotland) Regulations 2017
Environmental Impact Assessment Report (EIAR)	A report presenting the findings of the Environmental Impact Assessment (EIA).

Habitat	The natural home or environment of an animal, plant, or other organism.
Mitigation	Measure to avoid, reduce or offset potential adverse impacts.
Native	An animal or plant indigenous to a place.
Ordnance Datum	Vertical datum used by an ordnance survey as the basis for deriving altitudes on maps.
Piling	Heavy stakes or posts driven into the ground to support foundations.
Planning Advice Note	Supporting document to National Planning Policy Guidelines, which includes good practice and provides more specific advice of a practical nature.
Planning Boundary	The red line application boundary containing the Proposed Development, as defined.
Proposed Development	Establishment of a port and port related services for energy related uses.
RAMSAR site	Internationally important wetland identified for conservation under the RAMSAR Convention 1971.
Receptor	An element that is susceptible to being affected (either directly or indirectly by the Proposed Development.
Residual Impact	Remaining environmental impact after mitigation.
The Site	Former Fabrication Yard, Ardersier.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species are either maintained at or restored to a favourable conservation status.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 74/409/EEc) to protect important bird habitats.
Scottish Planning Policy (SPP)	A statement of Scottish Government policy on nationally important land use planning matters.
Sites of Special Scientific Interest (SSSI)	A designated site of national importance.
Stakeholder	A person or group that has an interest.
Whiteness Head	Shingle spit that is designated as a SSSI.
McDermott Yard	Former fabrication yard the occupied the Site.

Abbreviations and Acronyms

AA	Appropriate Assessment
AOD	Above Ordnance Datum
BOWL	Beatrice Offshore Windfarm Ltd
BPEO	Best Practical Environmental Option
BPM	Best Practicable Means
BS	British Standard
CD	Chart Datum
CEMD	Construction Environmental Management Document
CIEEM	Chartered Institute of Ecology and Environmental Management
CoPA	Control of Pollution Act 1947
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
dB	Decibel
ECIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPD	Environmental Protection Department
EPS	European Protected Species
ES	Environmental Statement
GENS	General Policy Principles Contained Within the National Marine Plan

HAT	Highest Astronomical Tide
HWLDP	Highland Wide Local Development Plan
IEF's	Impact Ecological Factors
IMFLDP	Inner Moray Firth Local Development Plan
LAT	Lowest Astronomical Tide
LDP	Local Development Plan
MHWN	Mean High Water Neap
MHWS	Mean High Water Spring
MLWN	Mean Low Water Neap
MLWS	Mean Low Water Spring
MORL	Moray Offshore Renewables Ltd
MSL	Mean Sea Level
NIA	Noise Impact Assessment
NMFS	Natural Marine Fisheries Service
NMP	National Marine Plan
NGD's	Noise Generating Development's
NPF3	National Planning Framework 3
N-RIP	National Renewables Infrastructure Plan
NSD's	Noise Sensitive Development's
NSR's	Noise Sensitive Receptors
NTS	Non Technical Summary
OD	Ordnance Datum

OEMD	Operational Environmental Management Document
PAN	Planning Advice Note
PMSC	Port Marine Safety Code
PPC	Pollution Prevention and Control
PPV	Peak Particle Velocity
PSPA's	Proposed Species Protection Areas
PTS	Permanent Threshold Shift
SEL	Sound Exposure Levels
SAC	Special Area of Construction
SPA's	Special Protection Areas
SPEAR	Simple Propagation Estimator and Ranking Model
SPP	Scottish Planning Policy
SSSI	Sites of Special Scientific Interest
TAN	Technical Advice Note
THC	The Highland Council
TTS	Temporary Threshold Shift
WHO	World Health Organisation

1.00 Introduction

1.01 **Background and Site Overview**

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of Ardersier Port Ltd ('the Applicant') to support the renewal of an application for planning permission in principle and marine licence applications for construction and dredging works in relation to the establishment of a port and port related services for energy related uses (hereafter referred to as the 'the Proposed Development') at the Former Fabrication Yard, Ardersier ('the Site').

The Site is located approximately 7.5km to the west of Nairn, 18km northeast of Inverness and 3km northeast of the village of Ardersier. The Site extends to 307 hectares of brownfield land. The Site was previously occupied by the McDermott Fabrication Yard for the construction of off-shore platforms for the oil and gas industry. The Site has been decommissioned and remediated.

In January 2014, The Highland Council granted planning permission in principle for the Proposed Development. At the same time the associated Harbour Revision Order was made by Transport Scotland and Marine Scotland granted marine licences for the construction and dredging works. A single Environmental Statement (ES) was prepared in 2013 to accompany all three consenting processes.

The previous landowner and applicant (Port of Ardersier Ltd) went into administration in October 2015. Ardersier Port Ltd acquired the site in July 2016 and is seeking permission from The Highland Council to renew the existing in principle consent (application reference: 13/01689/PIP) under the Town and Country Planning (Scotland) Act 1997 and informed by the Planning etc. (Scotland) Act 2006. Ardersier Port Ltd is also applying to Marine Scotland under the Marine (Scotland) Act 2010 for new marine licences for the construction and dredging works. The existing Harbour Revision Order was transferred to the current landowner in 2017.

A full description of the Site and Proposed Development is included in Chapter 3 of this EIAR.

1.02 **Purpose of the Environmental Impact Assessment**

Graham + Sibbald was appointed by the Applicant to prepare an updated EIA for the Proposed Development in accordance with the Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017 and the Marine Works (Environmental Impact Assessment)(Scotland) Regulations 2017 (hereafter referred to as 'the EIA Regulations 2017').

EIA is a systematic process of identifying environmental impact of the Proposed Development and evaluating the potential effects. The EIA identifies the methodologies used to assess the environmental effects predicted as a result of the construction, operation and decommissioning of the Proposed Development. It sets out the mitigation measures to avoid, prevent or reduce potential significant adverse environmental impacts. The residual effects following the implementation of mitigation measures are also identified.

1.03 **Structure of the EIAR**

The EIAR is presented in three volumes:

- Volume 1: Non-Technical Summary
- Volume 2: EIAR
- Volume 3: Technical Appendices

Volume 1 provides a Non-Technical Summary (NTS), as required by the EIA Regulations 2017. This stand-alone document provides a summary of the key findings of the EIA in non-technical language. This ensures that anyone with an interest in the Proposed Development can understand and access information on the predicted environmental effects.

Volume 2 comprises of the following 14 chapters:

- **Chapter 1 Introduction** - details the background to the Proposed Development. It describes the statutory basis for the EIA and details the structure of the EIAR. Chapter 1 also details the team responsible for the preparation of the EIA and their competence.
- **Chapter 2: EIA Process and Methodology** - summarises the scoping and consultation processes undertaken to establish the scope of the EIA. Chapter 2 provides details of the EIA Regulations 2017 requirements and process adopted in the preparation of the EIA. This details the approach adopted in the preparation of the individual technical assessments
- **Chapter 3: The Proposed Development –** provides a detailed description of the site and a description of the Proposed Development at construction, operation and decommissioning states. This Chapter also assesses the vulnerability of the development to climate change, natural disasters and major accidents.
- **Chapter 4: Site Selection and Alternatives –** identifies the reasoning for the selection of the site and considers alternative sites and options.
- **Chapter 5: Planning Policy Context –** provides a summary of the key planning policies relevant to the Proposed Development
- **Chapter 6 – 11 Technical Assessments** – reports on the finding of the detailed environmental assessments and identifies any proposed mitigation measures. The technical assessments also identify any cumulative and residual effects on the environment predicted to occur as a result of the Proposed Development.
- **Chapter 12: Schedule of Mitigation –** summarises all of the mitigation measures detailed within the EIAR.
- **Chapter 13: Summary of Residual Effects** – provides a summary of all predicted residual effects following mitigation.

Volume 3 contains the supporting technical appendices for each of the technical chapters. The table below details the list of appendices associated with the above chapters of the EIAR.

Table 1.1: List of Appendices

Chapter	Associated Technical Appendices
Chapter 2: EIA Process and Methodology	2.1 Scoping Report to The Highland Council 2.2 Scoping Report to Marine Scotland 2.3 The Highland Council Scoping Response 2.4 Marine Scotland Scoping Response 2.5 Summary of Scoping Requirements
Chapter 3: The Proposed Development	3.1 Site Boundary Plan 3.2 Indicative Masterplan 3.3 Construction Environmental Management Document 3.4 Proposed Extent of Capital Dredge Plan 3.5 Proposed Stockpile for Dredged Material Plan 3.6 Dredged Material Deposit Area Plan 3.7 Proposed Sequence of Works Plan 3.8 Works Above and Below Mean High Water Spring 3.9 Dredge Strategy and Best Practical Environmental Option
Chapter 4: Site Selection and Alternatives	4.1 Decision Notice for Planning Application Reference: 05/01294/OUT 4.2 Decision Notice for Planning Application Reference: 13/01689/PIP
Chapter 7: Terrestrial Ecology and Ornithology	7.1 Terrestrial Ecology and Ornithology EcIA 7.2 Protected Species Survey Report 7.3 The Habitats and Vegetation (NVC) of Ardersier Port 7.4 Whiteness Head, Ardersier Port, Ecological Assessment: Lichens 7.5 Breeding Bird Survey Report 7.6 Habitats Regulations Appraisal 7.7 Natural Heritage Management Plan
Chapter 8: Marine Ecology	8.1 Marine Ecology EcIA 8.2 Marine Mammal Protection Plan 8.3 Intertidal and Benthic Ecology
Chapter 9: Airborne Noise and Groundborne Vibration	9.1 Glossary of Acoustic Terms 9.2 Baseline Noise Survey 9.3 Construction Noise Assessment 9.4 Road Traffic Noise Assessment
Chapter 11: Water Environment	11.1 Topographic and Bathymetric Survey Report 11.2 Coastal Processes Report 11.3 Sediment Transport Monitoring Plan

1.04 **The Assessment Team**

Graham + Sibbald was appointed by the Applicant as EIA Project Manager. The EIA was undertaken by technical experts from a number of specialist consultancies as summarised in Table 1.2 below.

Table 1.2: EIA Team Technical Specialists

EIA Topic/Role	Consultant	Company	Experience	Qualifications
EIA Project Manager/Planning	[Redac	Graham + Sibbald	14 years private sector planning consultancy experience. 14 years' experience in the preparation and project management of EIA's.	B.A. (Hons) Environmental Planning MSc Urban Real Estate Management and Development MRTPI, MRICS, PIEMA
Shipping and Navigation	[Redac	1st Safety Solutions	26 Years in the HS&E profession 18 of which included marine safety specifically auditing against the Port Marine Safety Code Standard	NEBOSH General Certificate in occupational health and safety. Multitude of subject specific qualifications.

EIA Topic/Role	Consultant	Company	Experience	Qualifications
Terrestrial Ecology and Ornithology	[Redacted] (Lead Author)	EnviroCentre	25 years	BA(Hons), MSc Member of the Association of Environmental and Ecological Clerk of Works, Member of the Chartered Institute for Ecology and Environmental Management
	[Redacted] (Reviewer)	EnviroCentre	32 years	BSc, MSc, Member of the Association of Environmental and Ecological Clerk of Works, Fellow of the Chartered Institute for Ecology and Environmental Management and Vice President for Scotland and a member of the Governing Board
Marine Ecology	[Redacted] (Lead Author)	EnviroCentre	14 years	BSc (Hons), MSc
	[Redacted] (Reviewer)	EnviroCentre	As above	As Above
Airborne Noise and Groundborne Vibration	[Redacted]	Waterman Group	14 years' experience in acoustics, particularly related to noise and vibration inputs to large scale infrastructure and renewable energy EIA's and acoustic design. Mark has also been heavily involved with noise and vibration assessments in support of planning applications for large residential and mixed used developments both in the UK and abroad. Mark is experienced in the monitoring and assessment of environmental noise and vibration to numerous UK and international standards whilst also being experienced in the monitoring and assessment of occupational noise and vibration in line with the relevant guidance.	BSc (hons), PgDip Member of the Institute Of Acoustics
Underwater Noise	[Redacted]	Subacoustech	Consultant at Subacoustech Environmental since 2009, specialising in the development and execution of underwater noise models, noise data analysis and reporting.	BSc (Hons) Music and Sound Technology, University of Portsmouth (2008) Member of the Institute of Acoustics (MIOA)

EIA Topic/Role	Consultant	Company	Experience	Qualifications
	[Redacte	Subacoustech	Senior acoustic consultant at Subacoustech Environmental since 2011, specialising in project management and the assessment of both underwater and airborne acoustics.	BEng (Hons) Engineering Acoustics and Vibration, Institute of Sound and Vibration Research, University of Southampton (2001)
Water Environment	[Red acted (Lead Author)	EnviroCentre	7 years	BSc, MSc
Water Environment	[Reda cted] (Reviewer)	EnviroCentre	23 years	BEng (Hons), PhD, Member of the British Hydrological Society, Graduate Member of the Institution of Civil Engineers

1.05 **Viewing and Commenting on EIA**

A copy of the full EIAR will be available on The Highland Council's Public Access website.

An electronic copy of the EIAR can be made available on request free of charge by emailing planning@g-s.co.uk. A printed hard copy of the EIAR can be provided on request for a charge of £150+VAT to cover staff and printing costs.

If you have any comments or questions regarding the Proposed Development, please contact Ardersier Port Ltd c/o Graham + Sibbald at:
[Redacted]
Head of Planning
Graham + Sibbald
233 St Vincent Street
Glasgow, G2 5QY

If you wish to formally comment on the EIAR or make representations to the renewal of the planning permission in principle application please write to The Highland Council at the following address:
The Highland Council
Town House
Inverness, IV1 1JJ
Email: eplanning@highland.gov.uk

If you wish to formally comment on the marine licence applications please write to Marine Scotland at the following address:
Marine Scotland Licensing Operations Team
Marine Laboratory
375 Victoria Road
AB11 9DB
Email: ms.marinelicensing@gov.scot

References:

Scottish Government (1997) The Town and Country Planning (Scotland) Act 1997

Scottish Government (2006) Planning etc. (Scotland) Act 2006

Scottish Government (2010) Marine (Scotland) Act 2010

Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017

Scottish Government (2017) The Marine Works (Environmental Impact Assessment)(Scotland Regulations 2017

Scottish Government (2017) Planning Circular 1/2017: Environmental Impact Assessment Regulations 2017

2.00 EIA Process and Methodology

2.01 Introduction

This Chapter outlines the broad approach taken for the Environmental Impact Assessment (EIA) of the Proposed Development.

The Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017 and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 both came into force in May 2017 and implement the changes to the EIA Directive 2014/52/EU.

2.02 Scoping

Scoping is a voluntary part of the EIA process that seeks to identify effects which are likely to be significant and to exclude (scope out) effects which are not considered to be significant.

In 2013 a single Environmental Statement (ES) was prepared to accompany the application for planning permission in principle, marine licence applications and Harbour Revision Order for the establishment of a port and port related services for energy related uses at the former fabrication yard, Whiteness Head, Ardersier.

Early discussions were undertaken with The Highland Council, Marine Scotland and Transport Scotland in relation to the process to renew the existing consents. It was agreed by all consenting authorities that a single EIAR could be prepared to provide an updated version of the 2013 ES and to address the planning application and marine licence consenting requirements.
A Scoping Report was submitted to The Highland Council on the 27th March 2018 (a copy of the Scoping Report is contained within Technical Appendix 2.1). Following the submission of this Report to The Highland Council, Marine Scotland requested a separate Scoping Report specifically relating to the Marine Works (Environmental Impact Assessment)(Scotland) Regulations 2017. This Scoping Report was submitted to Marine Scotland on the 25th April 2018 (copy of Scoping Report contained within Technical Appendix 2.2).

A Scoping Opinion was received by The Highland Council on the 8th June 2018 (copy of Scoping Opinion contained within Technical Appendix 2.3). A Scoping Opinion was received from Marine Scotland on the 16th July 2018 (copy contained within Technical Appendix 2.4).

Table 2.1 details the consultees that were consulted at the Scoping stage.

Table 2.1: Consultees at Scoping Stage

Statutory Consultees	
The Highland Council (including Transport Planning, Flood Team, Environmental Health and Contaminated Land Team)	Marine Scotland (including Marine Scotland Science)
Transport Scotland	The Royal Yachting Association
SEPA	Royal Society for the Protection of Birds
SNH	The Northern Lighthouse Board
Scottish Water	Maritime Coastguard Agency
	Historic Environment Scotland
	Defence Infrastructure Organisation

Technical Appendix 2.5 provides a summary of the responses received at the Scoping stage and details where these have been addressed within the EIAR.

As a result of the Scoping process the following topics have been included within the EIAR:

- Shipping and Navigation
- Terrestrial Ecology and Ornithology
- Marine Ecology
- Airborne Noise and Groundborne Vibration
- Underwater Noise
- Water Environment

The following topics were included within the 2013 ES and have been 'scoped out' of this EIAR at the scoping stage:

- Contaminated Land
- Flood Risk
- Landscape and Visual
- Socio-Economics

Following receipt of the Scoping Opinions and during the preparation of the EIAR, the Applicant and their appointed consultants undertook further consultation with The Highland Council, Marine Scotland, SEPA and SNH.

2.03 **Requirement of EIA Regulations**

The EIAR has been prepared in accordance with Schedule 4 of the Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017 and the Marine Works (Environmental Impact Assessment)(Scotland) Regulations 2017. Table 2.2 below details the requirements of Schedule 4 and where these are addressed within the report.

Table 2.2: Schedule 4 Requirements

Schedule 4 requirement – Town and Country Planning Regulations	Schedule 4 requirement – Marine Works Regulations	Location within the EIAR
1. A description of the works, including in particular: (a) a description of the location of the works;	The same requirements as the Town and Country Planning Regulations	Chapter 3: The Proposed Development contains a detailed description of the Proposed Development in accordance with requirements (a), (b) and (c).

Schedule 4 requirement – Town and Country Planning Regulations	Schedule 4 requirement – Marine Works Regulations	Location within the EIAR
(b) a description of the physical characteristics of the whole works, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases; (c) a description of the main characteristics of the operational phase of the works (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.		Part (d) is addressed in Chapter 9: Airborne Noise and Groundborne Vibration, Chapter 10: Underwater Noise and Chapter 11: Water Environment.
2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the applicant, which are relevant to the proposed works and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	The same requirements as the Town and Country Planning Regulations	Addressed in Chapter 4: Site Selection and Alternatives.
3. A description of the relevant aspects of the current state of the environment (the "baseline scenario") and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	The same requirements as the Town and Country Planning Regulations	Addressed within technical Chapters 6 – 11.
4. A description of the factors specified in regulation 4(3) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	4. A description of the factors specified in regulation 5(3) likely to be significantly affected by the works: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	Addressed within technical Chapters 6 – 11. Given the nature of the Proposed Development, it is not considered that that the proposal will significantly affect human health. This is evident in the environmental topics that have been 'scoped in' to this EIAR.
5. A description of the likely significant effects of the works on the environment resulting from, inter alia: (a) the	The same requirements as the Town and Country Planning Regulations	Assessment of significant effects contained within technical Chapters 6 – 11.

Schedule 4 requirement – Town and Country Planning Regulations	Schedule 4 requirement – Marine Works Regulations	Location within the EIAR
construction and existence of the works, including, where relevant, demolition works; (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); (e) the cumulation of effects with other existing and/or approved works, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; (f) the impact of the works on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the works to climate change; (g) the technologies and the substances used.		Risk of major accidents and natural disasters is contained within Chapter 3: The Proposed Development. Details of projects considered as part of the cumulative assessment is contained within Chapter 3: The Proposed Development. Technical Chapter 6 – 11 contains an assessment of cumulative effects. Climate change is considered in Chapter 3: The Proposed Development. The proposed technologies is detailed within Chapter 3: The Proposed Development.
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	6. The description of the likely significant effects on the factors specified in regulation 5(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the works. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the works including in particular those established under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora(a) and Directive 2009/147/EC of the European Government and of the Council on the conservation of wild birds(b).	**Town and Country Planning Regulations –** Addressed within technical Chapters 6 – 11. **Marine Works Regulations –** The assessment of effects on the natural habitats (including flora and fauna and wild birds) is included in Chapter 7: Terrestrial Ecology and Ornithology.
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided,	7. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	**Town and Country Planning Regulations -** addressed within technical Chapters 6 – 11. Schedule of mitigation contained within Chapter 12. **Marine Works Regulations -** addressed within technical Chapters 6 – 11.

Schedule 4 requirement – Town and Country Planning Regulations	Schedule 4 requirement – Marine Works Regulations	Location within the EIAR
prevented, reduced or offset, and should cover both the construction and operational phases.		
8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development 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 Government and of the Council or Council Directive 2009/71/Euratom or relevant assessments may be used for this purpose provided that the requirements of this 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.	8. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	**Town and Country Planning Regulations -** an assessment of vulnerability to risk of major accidents and natural disasters is contained within Chapter 3: The Proposed Development. **Marine Works Regulations -** addressed within technical Chapters 6 – 11. Chapter 12 contains a Schedule of Mitigation.
9. A non-technical summary of the information provided under paragraphs 1 to 8.	9. 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 Government and of the Council on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC(c) or Council Directive 2009/71/Euratom establishing a community framework for the nuclear safety of nuclear installations(d) 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.	**Town and Country Planning Regulations –** A Non-Technical Summary is provided in Volume 1 of the EIAR. Marine Works Regulations – an assessment of vulnerability to risk of major accidents and natural disasters is contained within Chapter 3: The Proposed Development.

Schedule 4 requirement – Town and Country Planning Regulations	Schedule 4 requirement – Marine Works Regulations	Location within the EIAR
10. A reference list detailing the sources used for the descriptions and assessments included in the EIA report.	10.A non-technical summary of the information provided under paragraphs 1 to 9.	Town and Country Planning Regulations – a reference list is located at the end of each chapter. Marine Works Regulations – A Non-Technical Summary is provided in Volume 1 of the EIAR.
	11. A reference list detailing the sources used for the descriptions and assessments included in the EIA report.	A reference list is located at the end of each chapter.

2.04 **The EIA Process**

The general approach for each assessment has followed a standard structure of undertaking a baseline assessment, identifying potential effects of the Proposed Development, assessing cumulative effects, proposing mitigation measures and then assessing the significance of the residual effect with the mitigation in place.

The main stages in the assessment process for the Proposed Development included:

- Where required, baseline surveys were carried out to provide information on the existing environmental character of the Site and the surrounding area. For some of the technical assessments, it has been agreed at the Scoping stage that updated baseline surveys are not required. In these instances, reference has been made to previous survey work undertaken in 2013 and this is clearly referenced within the relevant Chapters.
- Consideration of the possible effects of the Proposed Development at construction, operation and decommissioning stages;
- prediction of the environmental effects, including direct, indirect, secondary, cumulative, short, medium and long term, permanent and temporary, beneficial and adverse effects;
- Identification of potential cumulative effects from other committed projects;
- Identification of mitigation measures designed to avoid, reduce or off-set adverse effects and enhance positive effects.
- Assessment of the significance of any residual effects after mitigation;
- Reporting of the results in this EIA Report.

2.05 **Assessment of Effects**

The assessment of effects for each environmental topic takes into account the effects resulting from the construction, operation and decommissioning phases of the Proposed Development. A range of criteria is used to determine whether or not the potential effects of the Proposed Development are likely to be significant'. The criteria varies between each environmental topic, but commonly includes:

- International, national and local designations or standards;
- Relevant planning policy requirements;
- Sensitivity of the receiving environment;
- Magnitude of impact;
- Reversibility and duration of the effect; and
- Cumulative effects.

For the purposes of this EIA, the assessment of 'significance' is attributed to the relationship between the magnitude of the change resulting from the Proposed Development and the sensitivity of the particular reception under assessment. The scale of sensitivity will vary between each environmental topic, but in general is considered to be the quality, value, rarity or importance of the receptor being assessed. The scale of sensitivity is classed as high, moderate, low or negligible. Table 2.3 below has been used in this EIA to determine the significance of effects. This table is used as a guide and professional judgement and good practice guidance has been applied in the assessment of significance in the technical assessments.

Table 2.3: Significance of Effects

Magnitude of Change	Sensitivity of Receptor/Resource			
	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate/Minor	Negligible
Medium	Major/ Moderate	Moderate	Minor	Negligible
Low	Moderate/Minor	Minor	Minor/Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Table 2.4 summarises the terms used in the EIAR to determine the level of effects predicted:

Table 2.4: Magnitude of Effects

Magnitude	Description
Major	Substantial change on the existing environment
Moderate	Noticeable change on the existing environment
Minor	Minor change on the existing environment
Negligible	No discernible change on the existing environment

For the purposes of this EIAR, any effects identified as being moderator or major are considered to be significant, unless specified otherwise in the individual technical chapters.

Each technical chapter contains an assessment of effects, identifies mitigation measures and specifies any residential effects following mitigation. Chapter 12 of the EIAR contains a summary schedule of mitigation measures. Chapter 13 provides a summary of all residual effects identified.

2.06 **Cumulative Assessment**

Schedule 4 of the EIA Regulations 2017 requires that cumulative effects are considered. The cumulative assessment considers the significant effects of the Proposed Development in combination with the effects of other past, present or future human activities.

Each of the technical Chapters assess potential cumulative effects. This assessment considers two types of cumulative effects as follows:

- In-combination effects – the combined effects of the Proposed Development from different environmental topics on a single receptor/resource e.g. underwater noise and marine ecology.
- Cumulative effects – the combined significant effects of the Proposed Development in combination within other 'reasonably foreseeable' projects in the vicinity of the Site on a single receptor/resource.

It has been agreed with The Highland Council that the following developments/projects should be considered as existing or proposed projects in

proximity to the Proposed Development and should be taken into consideration in the cumulative assessment:

- Norbord Factory Extension, Dalcross
- Castle Stuart Golf Course
- A96 Improvement Works
- Beatrice Offshore Windfarm
- Moray Offshore Windfarm (East and West)
- European Offshore Deployment Centre, Aberdeen Bay
- Shetland HVDC Cable
- Co-op Distribution Centre, Inverness Airport
- Tornagrain New Town
- Nigg Fabrication Yard
- Invergordon Service Yard

Table 2.5 below provides a summary update of the current status of the above developments/projects based on information available in the public domain.

Table 2.5: Cumulative Developments/Projects

Project	Description	Status
Norbord Factory Extension, Dalcross	Construction of new process buildings and equipment for a new Oriented Strand Board (OSB) mill and Biomass Heat Plant (and phased decommissioning of elements of existing OSB mill when the new mill is operational	Planning Permission Granted (24/11/14). Factory extension opened in April 2018.
Castle Stuart Golf Course	Construction of 2nd Championship Golf Course	Planning Permission Granted (04/07/16)
A96 Inverness to Nairn Dualling (including Nairn bypass)	A preferred route has been selected for the A96 Inverness to Nairn dualling works (including a Nairn by-pass). An Environmental Impact Assessment has been undertaken for the preferred route. Compulsory purchase process has commenced and draft Roads Orders prepared. Due to the number of objections received to the Compulsory Purchaser Orders and Roads Orders a Public Local Inquiry is currently underway.	Currently being considered at Public Local Inquiry (target determination date is March 2019)
Beatrice Offshore Windfarm	Offshore wind farm – up to 1,000mW comprising up to 277 turbines blade tip height of up to 198.4m.	Permission Granted by Scottish Ministers under Section 36 of the Electricity Act 1989 (19/03/14). Windfarm and transmission marine licences granted in August 2014 and varied in April 2018. Offshore windfarm currently under construction and is expected to be fully operational in 2019.
Moray Offshore East Windfarm	Moray Offshore East Windfarm comprises of the Telford, Stevenson and MacColl Offshore windfarms. In total these offshore windfarms will generate 1,116MW of energy. The maximum turbine blade-tip height will be 204m.	Permission Granted by Scottish Ministers under Section 36 of the Electricity Act 1989 (19/03/14). Marine licences granted in 2014. Section 36 consent and marine licences varied in March 2018.

Project	Description	Status
Moray Offshore West Windfarm	Installation of 85 wind turbines with a maximum height to tip of 285m, rotor diameter of 250m	Section 36 application and marine licences application submitted in July 2018. Applications currently under consideration.
European Offshore Wind Deployment Centre, Aberdeen Bay	Construction and operation of European offshore wind deployment centre electricity generating station	Scottish Ministers Granted Permission under Section 36 of the Electricity Act 1989 (26/03/13). Marine licences granted in August 2014 and updated in May 2018. Project currently under construction.
Nigg Bay, Aberdeen Harbour Expansion	Construction of new infrastructure to facilitate the creation of a new deep water harbour.	Planning permission in principle and marine licences were granted in 2016. Project currently under construction.
Co-op Distribution Centre, Inverness Airport Business Park	Erection of a chill/distribution facility (Site 2 – Plot 1) within the overall site previously approved in outline (ref: 08/00215/OUTIN) for Inverness Airport Business Park under Condition 1c forming part of the Phase 1 development Use Class 4 Offices (ancillary to main use), Use Class 5 General Industrial, and Use Class 6 Storage and Distribution (12,000sqft), including car parking, external yard, SUDs drainage, operational facilities and security/fencing/access gates, together with the discharge of PIP conditions relating to the overall masterplan and necessary infrastructure works as it applies to Phase 1(a)	Planning Permission Granted (21/09/17). Distribution centre opened in July 2018.
Tornagrain New Town	New Town Comprising up to 4,960 houses, community facilities, retail, business, general industry, storage and distribution, hotels, residential institution, leisure, petrol stations, and associated landscaping, open space, infrastructure, and services	Planning Permission Granted (06/11/13). Project currently under construction
Nigg Fabrication Yard	Amended proposal for an extension to the south quayside and new berthing to accommodate vessels of dead weight up to 35,000 tonnes including areas of hard standing and temporary lay down areas, together with tower lighting facilities. Includes dredging to depths of -10m Chart Datum	Planning Permission Granted 04/02/14). Dredging and construction marine licences granted in 2014. Development is operational.
Invergordon Service Yard	Expansion of service base. Construction of new berthing facility and laydown area (phase 3). Marine licence applications were submitted in May 2018 for Phase 4 Development which will provide 215m of new quayside and 11 acres (44,690m2) of usable surface following completion of the reclaimed land works, and 15.5 acres (62,760m2) of reclaimed land including the revetment structure.	Scottish Ministers Granted Permission under Section 36 of the Electricity Act 1989 for the expansion of the service base in January 2014. Marine licences were also granted in 2014. Phase 3 works completed and operational. The marine licence applications for Phase 4 are currently pending determination.

2.07 **Mitigation Measures**

Schedule 4 of the EIA Regulations 2017 requires the EIAR to provide *'a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment, and, where, appropriate, of any proposed monitoring arrangements'.*

Each of the technical Chapters (Chapter 6 – 11) details the proposed mitigation to address any identified significant effects. Chapter 12 contains a schedule of all proposed mitigation measures.

Chapter 13 details any residual effects of the Proposed Development, following mitigation.

2.08 **Assumptions and Limitations**

The EIA process is undertaken to enable decision making, based on the best available information on the environmental effects of the proposed development. However, there will be some degree of uncertainty in relation to the scale and nature of predicted environmental effects as this will be dependent on the level of detailed information available at the time of the assessment.

In this instance, the proposal is for planning permission in principle. Detailed information on the construction programme and specific requirements of end users are not known at this stage e.g. specified plant for noise assessment. It has therefore been necessary to make assumptions based on best practice guidance and professional judgement.

For the purposes of this assessment, it has been assumed that information (including publicly available information) is correct at the time of assessment.

The baseline conditions have been assumed to be accurate at the time of survey. However, due to the changing nature of the environment, these conditions may change to a certain degree during the stages of development (construction, operation and decommissioning).

The assessment of cumulative effects is depended on the availability of information on other developments at a strategic policy level or through consenting processes.

Any information gaps or assumptions made are detailed within the relevant technical Chapters.

2.09 **Public Consultation**

In accordance with the Town and Country Planning (Development Management Procedure)(Scotland) Regulations 2013, a public consultation event was held on the 21st June 2018 at Ardersier War Memorial Hall.

Seventeen members of the public and stakeholders (Local Councillors and representative from Highlands and Islands Airport) attended the event.

In accordance with the Marine (Scotland) Act 2010, a separate public event was held on the 14th September 2018. This event was attended by one person (a representative of the Northern Lighthouse Board).

Full details of the consultation undertaken is included within the two separate Pre-Application Consultation Reports submitted in support of the planning application to renew the existing in principle consent and the marine licence applications.

References

Institute of Environmental Management and Assessment (IEMA) (2004) Guidelines for Environmental Impact Assessment. Lincoln, UK7 IEMA; 2004

Scottish Government (2017) Planning Circular 1/2017: Environmental Impact Assessment Regulations 2017

Scottish Government (2013) Planning Advice Note 1/2013 Environmental Impact Assessment

Scottish Government (2017), Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017

Scottish Government (2017) Marine Works (Environmental Impact Assessment)(Scotland) Regulation 2017

Scottish Government (2013) Town and Country Planning (Development Management Procedure)(Scotland) Regulations 2013

Scottish Government (2010) Planning Advice Note 3/2010: Community Engagement

Scottish Government (2010) Marine (Scotland) Act

3.00 The Proposed Development

3.01 **Introduction**

This chapter of the EIA Report (EIAR) provides a description of the proposed port and port related services for energy related uses at the former Fabrication Yard, Whiteness Head, Ardersier.

This EIAR has been prepared to accompany a planning application to renew the existing planning permission in principle and marine licence applications for the dredging and construction works. As Ardersier Port Ltd (the Applicant) is applying to renew the existing Planning Permission in Principle (PPP) only, it is not possible at this stage to provide a detailed description of all elements of the proposed port and port related services e.g. building footprint, dimensions, construction programme, end user requirements etc. The description of development presented in this Chapter provides as much detail as possible at this stage, while leaving design and detailed matters to a further approval process, should permission be granted to renew the existing in principle consent.

To ensure that the Environmental Impact Assessment (EIA) is carried out on a worst case scenario, certain assumptions about the Proposed Development have been built into the assessment process, as detailed in the relevant sections below. This ensures that the EIAR is based around pre-defined parameters for all elements of the Proposed Development.

3.02 **Site Location**

The Site is located on the former McDermott Fabrication Yard land and extends to 307 hectares.

The McDermott Fabrication Yard opened in the early 1970s and closed in 2001. The site was previously used for industrial purposes for the fabrication and construction of off-shore platforms for the oil and gas industry. At its peak, the Fabrication Yard employed approximately 4,500 people.

The Site has been completely decommissioned and remediated. The Site has been a vacant brownfield site for approximately 17 years.

The Site is situated approximately 7.5km to the west of Nairn, 18km northeast of Inverness and 3km northeast of the village of Ardersier (grid reference: NH812 576).

The Site is bound to the north by the Moray Firth. Whiteness Head is situated to the east. Carse Wood is located to the south of the Site and an area of sand dunes and tidal mudflats is situated to the west. Fort George fortress is located to the south west of the Site boundary.

The site is relatively flat and benefits from an existing access road. The existing access road is 2.5km in length and connects the site to the B9092. The B9092 subsequently connects to the A96 which is the main transport route between Inverness and Aberdeen.

The site includes an existing harbour which is protected by a naturally occurring sand and shingle spit, known locally as 'Whiteness Head'.

The majority of the site was previously reclaimed using dredged sand. This was levelled behind a steel pile retaining wall at approximately 4.5m above ordnance datum.

The extent of the application boundary is shown in Technical Appendix 3.1.

3.03 **Summary of Proposed Elements**

The Proposed Development comprises of the following components:

- Access channel
- Inner channel/berthing
- Main port activity area
- Port support/administrative buildings
- Port related light industrial uses
- Pipe spooling area
- Temporary on-site storage area for dredged material

3.04 **Proposed Development Description**

Planning permission in principle was granted in January 2014 (application reference: 13/01689/PIP). The description of the proposed previously consented development is as follows:

"Establish a port and port related services for energy related uses, including marine channel dredging, quay realignment, repair and maintenance, erection of offices, industrial and storage buildings and associated infrastructure, delivery and export of port related cargo, associated new road access, parking, infrastructure, services, temporary stockpiling of dredged material, re-grading and upfilling of landward areas and landscaping".

The description of development remains unaltered. A copy of the proposed Indicative Masterplan is included in Technical Appendix 3.2.

3.05 **Construction Phase**

The Socio-Economic Assessment submitted as part of the 2013 Environmental Statement for the consented in principle application, estimated that there would be approximately 400 people employed at this site during the construction phase. It was also estimated that there would be approximately 308 vehicles entering the site at morning peak hours and exiting the site during evening peak hours. As Ardersier Port Ltd is submitting an application to renew the existing in principle consent, these estimates remain relevant and applicable.

<u>Capital Dredge</u>

The Proposed Development allows for the construction of quay wall facilities and capital dredging to form an access channel for shipping and associated structures using the port facility.

Maintenance dredging ceased at the site in 2001 when the Fabrication Yard closed. Since the last maintenance dredge was undertaken, there has been significant sedimentation within the dredged channel.

The capital dredge involves the dredging of the port entrance to -6.5m Chart Datum (CD). This will involve the removal of 2,300,000 m3 of sand by Cutter Suction Dredger (CSD), with the material initially being deposited directly via a discharge pipeline to the inner channel as reinstatement to the inner spit (200,000 m3) and onshore storage at the site (2,100,000 m3). An area of the inner channel is proposed to be dredged to -3mCD and will be carried out by either plough dredging, backhoe dredger or land-based equipment. This element of the proposed dredge is minor and represents 2-3% by volume of the overall dredge.

Site mobilisation and enabling works will be undertaken using a workboat with a survey vessel present when required. The workboat will lay out required pipelines for pumping the dredged material to their designated locations and this would commence 2-4 weeks before arrival of the cutter suction dredger.

The dredger, when it arrives on site, will connect to the pipelines and commence dredging operations. The dredger will commence from existing deep water in the South Channel and proceed inwards to the port, creating the dredged channel as it proceeds. Movement of the dredger is slow as it progresses in towards the main port area and will be serviced by the attendant support vessels.

During the dredging operations, regular interim surveys will be carried out to verify the achieved depth and alignment of the works and to calculate the dredged volumes of material.

Full details of the capital dredge methodology is included in the Construction Environmental Management Document (CEMD) included in Technical Appendix 3.3. The drawing contained within Technical Appendix 3.4 shows the proposed extent of the capital dredge.

The drawings included within Technical Appendices 3.5 and 3.6 show the proposed stockpile for dredged material and the dredged material deposit area. Technical Appendix 3.9 contains details of the Dredge Strategy and Best Practical Environmental Options for the disposal of dredged material.

Quay Wall Construction Works

The quay wall works will comprise of a new sheet pile wall either along the quayside or as a new alignment. The proposed sequence of works is as shown on the drawing in Technical Appendix 3.7. The drawings included within Technical Appendix 3.8 shows the proposed works above and below the Mean High Water Spring.

Only vibro-piling will be used, there will be no impact piling. In the area of the new extension, a temporary access bund will be placed along the quay wall to allow piles to be driven through this bund. The method of constructing the quay will involve initial construction of bunds but it is envisaged that all this construction would be land based.

At the end of quay construction there will be a requirement to reduce the existing dredge level on the seaward side of the quay to the required dredge depth to allow use of the quay. This would probably be carried out by land based excavator (long reach) and excavated material re-used to backfill against the new quay or taken to the temporary land storage area.

Surface Water Treatment

Surface water proposals for the development will be in accordance with the requirements of the SuDS Manual (CIRIA C753).

In terms of quantity, the end discharge of the surface water system will be to the sea and therefore the control of peak runoff rates and runoff volumes will not be required as part of the system.

The surface water system will incorporate appropriate SuDS (Sustainable Drainage System) measures to meet quality criteria for surface water discharge. Importantly, adequate land space will be identified to incorporate these measures within the detailed design of the development.

The potential pollution hazard level for the development proposal is, at this stage, regarded as 'High' (Ref SuDS Manual, Table 26.2) and will therefore require to mitigate for the following pollution hazard indices:

Total Suspended Solids	0.8
Metals	0.8
Hydrocarbons	0.9

At this in principle stage, the assumption is made that all areas will be trafficked and would require two levels of treatment. At this time, it is seen the most practical solution is to incorporate permeable pavement construction as the primary treatment followed by filter strip/drain treatment.

The SuDS mitigation indices (Ref SuDS Manual, Table 26.3) for these proposed treatments will be as follows

Mitigation Indices

SUDS Component	TSS	Metals	Hydrocarbons
Preamble Pavement	0.7	0.6	0.7
Filter Strip/drain	0.2	0.2	0.2
Total	**0.9**	**0.8**	**0.9**
High Pollution Indices	0.8	0.8	0.9

As detailed proposals are developed and more accurate potential for pollution is assessed, then the proposed measures can be refined and detail design of the SuDS system progressed.

Construction Management

The earliest date for commencement of capital dredge works and quay wall works will be 2019.

In accordance with condition 25 attached to the existing in principle consent (application reference: 13/01689/PIP), the pipe spool quay shall be located at least 250m from the roost site at the end of the spit.

The CEMD is included within Technical Appendix 3.3. This has been prepared to facilitate environmental management during the construction activities associated with the quay wall reinstatement and dredging.

The CEMD has been prepared in accordance with The Highland Council Guidance on Construction Environmental Management Process for Larger Scale Projects (August 2010).

The document contains the following specific mitigation plans:

- Archaeological Reporting Protocol
- Habitat Management Plan
- Maine Mammal Protection Plan
- Pollution Prevention Plan
- Dust Management Plan
- Noise and Vibration Plan
- Site Waste Management Plan; and
- Sediment Transport Monitoring Plan

3.06 **Operational Phase**

The Environmental Statement (ES) that accompanied the 2013 in principle planning application submission estimated that a total of approximately 2,500 people would be employed at this Site once the site is fully operational.

It was previously assumed that there would be approximately 770 vehicles arriving during the peak hours and departing the Site during the evening peak hours once operational. As Ardersier Port Ltd is submitting an application to renew the in principle consent granted in 2014, these assumptions remain applicable and relevant.

Construction works will commence in 2019 at the earliest. The full Site operations will be dependent on market demand and requirements. The specific operational details will be dictated by occupier requirements. A detailed description of the operational phase can be provided at the detailed design stage.

For the purposes of the EIAR, it is assumed at this stage that the Proposed Development will include the elements detailed in paragraph 3.13 above and as shown on the Indicative Masterplan (Technical Appendix 3.2).

For the purposes of this assessment, it is assumed that the Site will be illuminated at night. Full details of the lighting strategy can be confirmed at the detailed design stage. Any lighting used at the Site will fully adhere to the Health and Safety Executive Guidance on Lighting for Ports (SIP009).

It is assumed at this stage that the Site will be connected to the public sewage system by way of the existing pump station situated to the south east side of the site. This existing pumping station connects to the Scottish Water Treatment Works at the village of Ardersier. The Proposed Development will not discharge into the marine environment. Full drainage design and Surface Water Drainage System details will be provided at the detailed design stage.

Maintenance Dredging

Given the location of Ardersier Port and the surrounding environment, maintenance dredging will be an important consideration during the operational phase of the development. Based on a review of historical records at the time the site operated as a Fabrication Yard, maintenance dredging was previously carried out every 18-24 months with a typical dredge quantity in the order of 100,000 – 150,000 m^3. Volumes can vary significantly depending on weather events in the intervening period.

Although the projections of the quantities of maintenance dredge volumes are based on previous records, exact volumes cannot be confirmed that this stage.

The Dredge Strategy and Best Practicable Environmental Option (BPEO) (Technical Appendix 3.9) provides details of the proposed strategy for the reuse of maintenance dredged material.

Operational Management

Condition 15 attached to the planning permission in principle granted in 2014 (application reference: 13/01689/PIP) requires the submission of an Operational Environmental Management Document (OEMD). Ardersier Port Ltd remains committed to the preparation of this document in advance of any part of the site becoming operational.

3.07 **Decommissioning**

It is currently estimated that the Site will remain operational as a port and for port related services for a period of 25 years.

Following the closure and decommissioning of the port and related services, the buildings on the Site will be demolished and the land will become cleared brownfield land.

The Site was previously used as a Fabrication Yard and this use ceased operations in 2001. The buildings associated with the Fabrication Yard were demolished and the land was remediated. The Site has already been decommissioned and remediated to allow an alternative development (such as the proposed port and port related services) to be brought forward.

3.08 **Vulnerability of the Proposed Development to Risks of Major Accidents and Natural Disasters**

In accordance with Section 8 of Schedule 4 of both the Town and Country Planning and Marine Works EIA Regulations, the EIAR should contain:

"A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development risks of major accidents and/or disasters which are relevant to the project."

IEMA has defined major accidents and natural disasters as *"man-made and natural risks which are considered to be likely, and are anticipated to result in substantial hard that the normal function of the project is unable to cope with/rectify i.e. a significant effect."* (IEMA 2016).

The Proposed Development will not involve the use of hazardous substances or chemicals. The only risk of major accidents applicable to the Ardersier proposed development is the risk of pollution which is fully assessed within Chapter 11: Water Environment.

In addition a copy of the CEMD is included in Technical Appendix 3.3, this contains details of the precautionary methods of working and a Pollution Prevention Plan to avoid or minimise the risk of any pollution incidents occurring.

The only natural disaster applicable to this site would be flood risk. A Flood Risk Assessment was initially prepared for the site in 2006. The report assessed the joint probabilities of coastal and fluvial flooding and examined a range of possible climate change scenarios to the 2080's. The 2013 Environmental Statement that accompanied the application for planning permission in principle for the establishment of a port and port related services included an updated Flood Risk Assessment, to reflect more recent climate change predictions. No further updates on climate change predictions have been published since 2013.

The climate change updates considered in 2013, demonstrate that the previous levels are now considered more conservative and would provide for additional freeboard protection. The previously assessed 1 in 200 year return period event is therefore higher than the present prediction for the 1 in 1,000 year return period event.

The 2013 Flood Risk Assessment concluded that there will be no increase in flood risk to the nearby properties on the Carse of Ardersier, as a result of the Proposed Development. The properties are identified as being at an increased risk of flooding for the design event by the 2080's, however, this is due to the predicted increases in extreme water levels as a result of climate change. The assessment of residual effects for flood risk remain valid.

The above assessment of flood risk has been agreed with SEPA. The requirement for the assessment of flood risk within this EIAR has been scoped out.

3.09 **Vulnerability of the Proposed Development to Climate Change**

Section 4 of Schedule 4 of both the Town and Country Planning and Marine Works EIA Regulations requires that the significant effects on climate change are assessed.

The vulnerability of the project to climate change is primarily through flood risk. This risk is detailed above in paragraphs 3.57 – 3.60 above and has been scoped out of the EIAR.

In terms of greenhouse gases, in 1992 the United Nations Framework Convention on Climate Change (UNFCCC) recognised that there is a serious issue with climate change and there is a need to stabilise greenhouse gas levels. The Kyoto Protocol (adopted in 1997) came into force in 2005 and committed industrialised countries to limit and reduce greenhouse gas emissions. The Paris Agreement aims to further strengthen the response to climate change by keeping global temperature rise this century well below 2^{o}C above pre-industrial levels and pursue efforts to limit the temperature increase even further to 1.5^{o}C.

The Climate Change (Scotland) Act 2009 sets out targets to reduce emissions from 1990 baseline levels by 80% b 2050.

In February 2018, the Scottish Government published the Climate Change Plan: Third Report on Policies and Proposals 2018 – 2032. The latest data on Scotland's performance from 2015 Greenhouse Gas Inventory show that Scotland's actual emissions fell by 3% between 2014 and 15 and were 38% below 1998 emissions, compared with a reduction of 35% for the UK as a whole.

The latest UK Government data shows that the equivalent of 54% of Scotland's gross electricity consumption came from renewable sources in 2016, compared to 12.2% in 2000. Scotland is therefore well on the way to achieving the targets of generating 100% of electricity demand from renewables by 2020 and 50% of all energy for Scotland's heat, transport and electricity consumption from renewables by 2030.

The Site is not located within in Air Quality Management Area. Air quality was scoped out of the Environmental Statement prepared in 2013 to accompany the application for planning permission in principle for the establishment of a port and port related services.

The planning application being submitted by Ardersier Port Ltd is to renew the existing in principle consent to establish a port and port related services. The Proposed Development is currently at the 'in principle' stage and the detailed design of the development will be brought forward through a separate application process. It is at this stage that specific design details and the footprint of the proposed buildings will be known and the energy consumption for the construction, operation and decommissioning stages can be fully calculated.

The proposed materials to be used in the construction works and sources of materials will not be known until the detailed design stage and when a contractor has been appointed. It should be noted that the construction of this 307 hectare site will be delivered over phases to completion. The phasing and timescales associated with the construction works will minimise the greenhouse gas effects associated with this proposed development. Ardersier Port Ltd is fully committed to adopting sustainable construction methods during the construction and decommissioning of the proposed development. Construction material will be sourced locally to reduce carbon costs associated with transportation. Effective construction working practices will be implemented to ensure that the energy usage associated with the construction and decommissioning of the proposed development are minimised e.g switching off machinery when not in use.

At the detailed design stage, full consideration will be given to incorporating energy efficiency measures and technologies in the design and operation of the proposed buildings. This will seek to minimise the use of electricity in the operation of the proposed development. Ardersier Port Ltd is also committed to the preparation of a Travel Plan in advance of the site becoming operational to ensure that future employees can travel to and from the site by sustainable modes of transport and to manage travel demands and use of the private car.

References

Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017

Scottish Government (2017) The Marine Works (Environmental Impact Assessment)(Scotland Regulations 2017

Scottish Government (2017) Planning Circular 1/2017: Environmental Impact Assessment Regulations 2017

Port of Ardersier Ltd (2013) Volume 2 Environmental Statement for Establishment of Port and Port Related Services for Energy Related Uses at Former Fabrication Yard, Ardersier.

IEMA (2016) Assessing Risk of Major Accidents/Disasters in EIA

IEMA and Arup (2017) Assessing Greenhouse Gas Emissions and Evaluating their Significance

CIRIA (2015) SuDs Manual C753

The Highland Council (2010) Guidance on Construction and Environmental Management Process for Larger Scale Projects

HSE (2017) Guidance on Lighting for Ports SIP009

Scottish Government (2009) Climate Change (Scotland) Act

Scottish Government (2018) Climate Change Plan: Third Report on Policies and Proposals 2018 – 2032

4.00 Site Selection and Alternatives

4.01 Introduction

Section 2 of Schedule 4 of the Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017 (Regulation 5) and The Marine Works (Environmental Impact Assessment)(Scotland) Regulations 2017 (Regulations 6(2)(f) and 21(2)) requires an EIAR to include a description of alternatives. This should include:

"*A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects.*"

This Chapter describes the main alternatives considered by Ardersier Port Ltd and the reasons for the final project choice.

4.02 Existing Planning Consents

In November 2007 outline planning permission was granted for a residential and leisure development including housing, marina, boat yard, yacht club, visitors centre, nature conservation zones and hotel with supporting community facilities and sewage treatment plan (application reference: 05/01294/OUT).

In October 2012 a Section 42 (of the Town and Country Planning (Scotland) Act 1997) application was submitted to vary condition 1 of planning permission 05/01294/OUT to extend the time limit of the consent. This application was approved in February 2013 and this consent is due to expire in February 2020.

A copy of the decision notices in relation to the residential and leisure consent are contained within Technical Appendix 4.1.

On the 30th January 2014 planning permission in principle was granted for the following development.

"*Establish a port and port related services for energy related uses, including marine channel dredging, quay realignment, repair and maintenance, erection of offices, industrial and storage buildings and associated infrastructure, delivery and export of port related cargo, associated new road access, parking, infrastructure, services, temporary stockpiling of dredged material, re-grading and upfilling of landward areas and landscaping*".

A copy of the decision notice for the above planning application (reference: 13/01689/PIP) is contained in Technical Appendix 4.2. This planning consent is due to expire in January 2019. The previous owners of the site went into Administration in 2015 and this land was acquired by Ardersier Port Ltd in 2016. This consent has not be implemented due to market conditions and as the previous landowner/applicant was in Administration. Ardersier Port Ltd (current landowner and Applicant) is submitting an application to renew the existing in principle planning consent.

4.03 **Consideration of Alternatives**

In assessing the alternative options in relation to the Proposed Development, it is considered that there are four potential alternative scenarios. These are:

- No development scenario
- Develop site for consented residential and leisure use
- Develop proposal on alternative site
- Development alternative proposal at this location

No Development Scenario

The no development scenario would result in the Site remaining as long term vacant brownfield land. This option would result in a minimal impact on protected species and habitats. The continuation of the Site as vacant land would also result in no noise impact. It could be considered that while there are no buildings or structures on site, there is no landscape and visual impact. However, it could also be considered that a previously developed cleared brownfield site provides no opportunity for landscape or biodiversity enhancement. This scenario would result in no direct or indirect socio-economic benefits.

Develop Site for Residential and Leisure Use

As detailed above, there is an existing live outline planning consent for a residential and leisure development at this location. This consent remains valid until February 2020. The use of the site for residential and leisure use represents an alternative option for the Site, that has already been considered as acceptable in planning terms.

The original outline planning permission (submitted in 2005) was accompanied by an Environmental Statement (ES) and the environmental effects (both positive and negative) associated with a residential and leisure development at this Site have been fully assessed.

Outline planning permission was initially granted in 2007. There has been a planning consent in place for over 10 years for a proposed residential and leisure development and this was not progressed by the previous landowners.

It is noted that, in November 2013 outline planning permission was granted for the development of a new town comprising of up to 4,960 houses, community facilities, retail, business, general industrial, storage and distribution, hotels, residential institution, leisure and petrol stations at land North East of Tornagrain (in between Inverness and Nairn). This development is currently under construction.

Given the close proximity of Tornagrain to the Site, any residential development at this location will be driven by market demand.

Alternative Site

In terms of an alternative location, the land at Ardersier extends to 307 hectares. There is no other suitable brownfield sites of this scale available on a coastal location with suitable harbour facilities to accommodate the Proposed Development.

The former Fabrication Yard at Nigg and the Service Yard at Invergordon are both located in coastal locations with existing harbour facilities and could potentially

accommodate at part of the proposed development. However, both sites are subject to development proposals and are therefore not available to accommodate the Proposed Development.

The former Fabrication Yard at Nigg is allocated in the Inner Moray Firth Local Development Plan for industrial use. The site area extends to 210.9Ha and is therefore of a scale that could accommodate a significant proportion of the Ardersier proposal. A Masterplan has been prepared by The Highland Council in 2013 to guide development at this location. In 2014 permission was granted to extend the harbour and berthing facilities at the South Quay to provide increased capacity for oil and gas related port facilities as well as potential port facilities for the renewables industry.

The Invergordon Harbour Area extends to 21.3 and is allocated in the Inner Moray Firth Local Development Plan for industrial and business use. The site size means that it would only be capable of accommodating a small element of the Ardersier proposals. The Cromarty Firth Port Authority has obtained consent under Section 36 of the Electricity Act 1989 and relevant marine licences to expand the service base at Invergordon by constructing a new berthing facility and laydown area to accommodate the growing requirements of the renewable energy sector. This development is now operational. In May 2018, marine licence applications were submitted for land reclamation works and for a new quayside (phase 4 of the works at Invergordon). These applications were pending determination at the time of this assessment.

Both locations are subject to development proposals and are therefore not available to accommodate the proposed developments. The proposed development at Ardersier will complement the facilities at Nigg and Invergordon. The combination of the three port facilities are in line with the vision of the National Renewables Infrastructure Plan to ensure that the Highlands becomes a nationally important location for the renewable energy sector and a leader in the manufacturing of renewable energy technology.

<u>Alternative Development Proposal for the Site</u>

In terms of an alternative development proposal for the Ardersier site, the development of the site for residential and leisure use has previously been explored through the obtaining of outline planning consent. The current application is to renew existing consents for a mix of port and port related uses including manufacturing, light industrial, office, research & development etc. The planning application is for planning permission in principle and the specific end uses will be brought forward through a separate consenting process and will be market driven.

A wide range of uses for the site have been considered through the granting of the two existing consents for the Sites. Both applications were accompanied by an EIA to assess the environmental effects associated with each proposal.

4.04 **Site Selection**

The National Planning Framework 3 specifically identifies that Ardersier is well placed to take advantage of investment in the energy section.

The Highland Wide Local Development Plan 2012 allocates the Site as a Strategic Development Site and supports the development of the Site as part of the long term housing supply and for renewables related development.

The Inner Moray Firth Local Development Plan 2015 allocates the site for industrial use and specifically identifies acceptable uses for the site as being renewables innovation, manufacturing and maintenance hub.

The planning policy context is assessed in detail in Chapter 5 of this EIAR.

The proposed use of the site as a port and for port related services for energy related uses accords with the planning policy requirements for the site. Furthermore, the site was previously in industrial use as the former McDermott's Fabrication Yard. It is considered that in land use terms, the site is appropriate for the Proposed Development and that this will create employment opportunities of a scale similar to the previous operations at the site. The environmental effects associated within this selected Proposed Development are assessed within this EIAR.

References

Scottish Government (1997) The Town and Country Planning (Scotland) Act 1997

Scottish Government (2014) National Planning Framework 3

Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations 2017

Scottish Government (2017) The Marine Works (Environmental Impact Assessment)(Scotland Regulations 2017

Scottish Government (2017) Planning Circular 1/2017: Environmental Impact Assessment Regulations 2017

Highlands and Islands Enterprise and Scottish Enterprise (2010) National Renewables Infrastructure Plan

Port of Ardersier Ltd (2013) Volume 2 Environmental Statement for Establishment of Port and Port Related Services for Energy Related Uses at Former Fabrication Yard, Ardersier

The Highland Council (2012) Highland Wide Local Development Plan

The Highland Council (2015) Inner Moray Firth Local Development Plan

5.00 Planning Policy Context

5.01 **Introduction**

This chapter outlines the relevant planning policy considerations for the Proposed Development. This includes reference to national, regional and local planning policies. It also details other national policies that are a material considerations.

This Chapter identifies the policies of relevance to the Proposed Development. An assessment of the Proposed Development's compliance with these policies is not included. This is covered in the separate Planning Supporting Statement (Graham + Sibbald 2018) that has been submitted with the application to renew the existing planning permission in principle.

5.02 **National Policy**

National Planning Framework 3 (NPF 3)

National Planning Framework 3 (NPF3) sets out the long-term vision for development and investment across Scotland over the next 20 to 30 years. NPF identifies national developments and other strategically important development opportunities in Scotland. It is accompanied by an Action Programme which identifies how NPF is to be implemented, by whom, and when.

The current NPF was published in June 2014. It sets out the long term strategy for Scotland and seeks to share the benefits of growth by encouraging economic activity and investment across all of Scotland's communities, whilst protecting the natural heritage and cultural assets.

NPF contains four key aims which form the vision for Scotland's' future. These are set out below.

- A successful, sustainable place
- A low carbon place
- A natural resilient place
- A more connected place

NPF3 identifies the diverse and distinctive opportunities for each of the city regions of Scotland. The Inner Moray Firth, and specifically Ardersier is identified as being well placed to take advantage of investment currently being made in the Inverness City Region.

NPF3 identifies that there are opportunities to develop the existing strengths of coastal and island areas, particularly where the growing opportunities in and around the cities network for renewable energy development, have a strong coastal dimension. NPF3 requires that land use and marine planning should aim to balance development with environmental quality and activities.

The NPF3 identifies opportunities for manufacturing and servicing to support the renewable energy sector as an opportunity to broaden the distribution of employment to rural areas. NPF3 details that Ardersier is specifically identified as an opportunity site in the National Renewables Infrastructure Plan (N-RIP). NPF3 states

that such site are within rural areas where new employment could have a significant impact on local economies.

NPF3 states that Ardersier *"is well-placed to take advantage of investment in the energy sector, both in renewables and in oil and gas".* NPF3 recognises the wider economic benefits that will be gained by developing this site as proposed, and NPF supports its development provided the continuing protection of the very special environment of the Moray Firth will be protected.

Scottish Planning Policy (SPP)

Scottish Planning Policy (SPP) is a statement of Scottish Government policy on land use and planning and contains the Scottish Government's view on the purpose of planning and the core principles and objectives for the operation of the planning system. SPP provides statutory guidance on sustainable development and planning.

The current SPP was published in 2014 and sets out national planning policies which reflect Scottish Ministers priorities for the operation of the planning system and for the development and use of land.

SPP states that local authorities should maximise benefits while balancing competing interests. SPP also encourages economic growth, particularly the creation of new jobs and strengthening of economic capacity and resilience within communities as a core value of the planning service.

SPP contains 4 outcomes that support the vision taken from NPF3, these are;

- Outcome 1: A successful sustainable place;
- Outcome 2: A low carbon place;
- Outcome 3: A natural resilient place; and
- Outcome 4: A more connected place.

Principal Policy: Sustainability – the SPP introduces a presumption in favour of development that contributes to sustainable development. Decisions by local authorities should be guided by the following principles which are applicable to the Proposed Development:

- Giving due weight to net economic benefit;
- Responding to economic issues, challenges and opportunities, as outlined in local economic strategies;
- Supporting good design and the six qualities of successful places;
- Supporting delivery of infrastructure;
- Supporting climate change mitigation and adaptation including taking account of flood risk;
- Protecting, enhancing and promoting access to cultural heritage, including the historic environment; and
- Protecting, enhancing and promoting access to natural heritage, including green infrastructure, landscape and the wider environment.

SPP encourages local planning authorities to support development that contributes to sustainable development economically and environmentally.

Principal Policy: Placemaking – carries forward the aims in NPF3 in creating an agenda for placemaking reflecting the Scottish Governments policy statement on

architecture and place for Scotland Creating Places. The three main policy principles are:

Subject Policy: A Successful, Sustainable Place – Promoting Rural Development Supports the aims of NPF3 in achieving vibrant rural, coastal and island areas. SPP requires that the planning system should:

- In all rural and island areas promote a pattern of development that is appropriate to the character of the particular rural area and the challenges it faces;
- Encourage rural development that supports prosperous sustainable communities and businesses whilst protecting and enhancing environmental quality; and
- Support an integrated approach to coastal planning.

Subject Policy: A Successful, Sustainable Place - Supporting Business and Employment requires that the planning system should:

- Promote business and industrial development that increases economic activity while safeguarding and enhancing the natural and built environments as national assets;
- Allocate sites that meet diverse needs of different sectors and sizes of businesses which are important to the plan area in a way which is flexible enough to accommodate changing circumstances and allow the realisation of new opportunities; and
- Give due weight to net economic benefit of proposed development.

Subject Policy: A Low Carbon Place – Delivering Heat and Electricity. SPP facilitates the development of generation technologies that will help to reduce greenhouse gas emissions from the energy sector. It also recognises that renewable energy presents a significant opportunity for associated development, investment and growth of the supply chain, particularly for ports and harbours identified in the National Renewables Infrastructure Plan.

Subject Policy: A Natural Resilient Place – Valuing the Natural Environment. SPP upholds the requirement for "appropriate assessment" of the implications of the proposals against the Natura 2000 network of protected areas.

5.03 **Local Planning Policy**

<u>The Highland Wide Local Development Plan (HwLDP)</u>

The HwLDP was adopted by The Highland Council in 2012. The plan sets out a strategy to support the growth of all communities across the Highlands. The plan directs development, in the first instance, to places with sufficient existing or planned infrastructure and facilities to support sustainable development.

The HwLDP contains a vision for the Inner Moray Firth area which seeks to direct development to appropriate locations whilst ensuring the benefits are experienced by all communities.

The A96 Corridor Strategy directs the majority of the area's growth to the corridor between Inverness and Nairn. The extract below from page 36 of the HwLDP shows Whiteness Head (the Site) as an identified development site within the A96 Strategy Area.

Figure 5.1: A96 Corridor Strategy Map Extract from HwLDP

Policy 9 A96 Corridor - Phasing and Infrastructure requires that applicants demonstrate that the proposed development will not adversely affect the integrity of the Moray Firth SAC, Loch Ashie SPA, River Moriston SAC and Urquhart Bay Wood SAC either alone or in combination with other plans or projects.

The HWLDP designates the Site as a Strategic Development Site referred to as 'Whiteness'. The HWLDP supports the development of the Site as part of the long term housing supply and also supports renewables related development.

Policy 14 Whiteness details that the Council requests that the proposals come forward via a Masterplan. Applicants must also demonstrate that there will be no adverse effects on the integrity of the Inner Moray Firth SAC and Inner Moray Firth SPA/Ramsar site.

Policy 28 Sustainable Design details that the Council will support developments which promote and enhance the social, economic and environmental wellbeing of the people of the Highlands. Proposed developments will be assessed against a number of criteria.

Policy 28 states that *"where environmental and/or socio-economic impacts of a proposed development are likely to be significant by virtue of nature, size or location, The Council will require the preparation by developers of appropriate impact assessments."*

Policy 42 Previously Used Land details that the Council will support development proposals that bring previously-used land back into beneficial use provided that site investigation and risk assessments are undertaken to demonstrate the site is in, or is capable of being brought into, a condition suitable for the proposed development and that the proposed development accords with all other relevant polices in the plan.

Policy 49 Coastal Development states that developments on the coast should show consideration to the range of existing interest ensuring best use of resources, taking

account of existing and planned marine activities and development. Proposals should not have an unacceptable impact on the natural, built or cultural heritage and amenity value of the area.

Policy 49 continues that *"the Council will promote the landward side of the road for development where proposals on the coastal side would otherwise interrupt scenic views over open water: unless a coastal position is necessary, or if the effect would be a conflict with the existing settlement pattern. Where development on the coast is justified, opportunities for the development or reuse of previously used land and buildings should be considered in the first instance. The site should not be at risk from coastal erosion or flooding or cause an unacceptable impact as a result of natural coastal processes which it triggers or accentuates... Erosion data should be consulted when determining whether natural coastal processes have potential to be an issue. Other important factors will be potential landscape impact, and effect on the setting of coastal communities. Consideration will be given to the potential for any proposal to result in coalescence."*

Policy 56 Travel - Development proposals that involve travel generation must include sufficient information with the application to enable the Council to consider any likely on and off site transport implications of the development. Where site masterplans are proposed, they should include consideration of the impact of proposals on the local and strategic transport network.

Policy 57 Natural, Built and Cultural Heritage states that all development proposals will be assessed, taking into account the level of importance and type of heritage features, the form and scale of the development and any impact on the feature and its setting, in the context of the policy framework. This policy is applicable to features of local/regional, national and international importance.

Policy 58 Protected Species details that where protected species are present on site the Council will require that a survey is undertaken to establish the presence of protected species and if necessary a mitigation plan is prepared to avoid or minimise any impacts on the species.

Policy 59 Other Important Species outlines that the Council will have regard to the presences of and any adverse effects of a proposed development on Other Important Species. This includes species listed in Annex II and V of the EC Habitats Directive, priority species listed in the UK and Local Biodiversity Action Plans and species included in the Scottish Biodiversity List.

Policy 60 Other Important Habitats and Article 10 Features states that the Council will seek to safeguard the integrity of features of the landscape which are of importance for the movement of wild fauna and flora. The Council will have regard to the value of habitats listed in Annex I of the EC Habitats Directive, habitats of priority and protected bird species, priority habitats listed in the UK and Local Biodiversity Action Plans and species included in the Scottish Biodiversity List.

Policy 61 Landscape details that new development should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed.

Policy 63 Water Environment outlines that the Council will support proposals for development that do not compromise the objectives of the Water Framework Directive.

Policy 64 Flood Risk details that development proposals should avoid areas susceptible to flooding and promote sustainable flood management. The policy also states that developments that border the coast may be at risk of climate change.

Policy 65 Waste Water Treatment specifies that connection to the public sewer is required for all new development proposals.

Policy 72 Pollution states that proposals that may result in significant pollution such as noise, air, water and light will only be approved where a detailed assessment report on the levels, character and transmission and receiving environment of the potential pollution is provided by the applicant to show how the pollution can be appropriately avoided and if necessary mitigated.

Inner Moray Firth Local Development Plan

The Inner Moray Firth Local Development Plan (IMFLDP) was adopted in July 2015 and represents a guide for development and investment in the Inner Moray Firth area to 2035. This Plan sits alongside the HwLDP to provide the framework for delivery of new homes, jobs and services, and supporting infrastructure. The Plan provides greater certainty on how development sites should be delivered.

The IMFLDP identifies two growth areas. The Proposed Development Site sits within the Inverness to Nairn Growth Area (Whiteness). The Plan states that investment will be made in infrastructure to promote growth; in road improvements to the adjacent A96 and in an improved travel network.

The IMFLDP specifically allocates 307 hectares at Whiteness (the Site) for industrial use (site reference: WH1). As detailed in the policy extract below, the site is identified for renewables, innovation, manufacturing and maintenance hub.

Industry

Site: WH1 Whiteness

Area (ha): 307 **Uses:** Industry (renewables innovation, manufacturing and maintenance hub).

Requirements: Developer to prepare masterplan / development brief to be agreed with the Council who may adopt this as Supplementary Guidance. This should address: phasing; scale of development; access by all modes of transport; any contamination issues with previously used land; species, habitats and other heritage issues; impacts on the water environment; flood risk; waste water treatment; surface water drainage pollution; air quality; geomorphology. No adverse effects on the integrity of the Moray Firth SAC and the Inner Moray Firth SPA and Ramsar, alone or in combination via:

- compliance with JNCC piling guidance, **Marine Scotland** dredging and disposal guidance including any modification to the natural processes of the spit (both for capital and maintenance spoil), vessel movements as assessed through the "Dolphin and Development" model;
- Construction Environment Management Plan (including pollution prevention);
- Operational Environment Management Plan (including pollution prevention);
- Boat Traffic Management Plan;
- Noise and Vibration Mitigation Plan;
- Oil Spill Contingency Plan.

Policy 4 (Water and Waste Water Infrastructure in the Inverness to Nairn Growth Area) of the IMFLDP sits alongside Policy 65 (Waste Water Treatment) of the HwLDP.

Policy 4 details that all allocated developments in the Inverness to Nairn Corridor will be required to connect to the public sewer. Development proposals must demonstrate that there is no adverse effect on the integrity of the bottlenose dolphin qualifying interest of the Moray Firth Special Area of Conservation.

Chapter 8 of this EIAR relates to marine ecology and includes an assessment of effects of the proposed development on bottlenose dolphins.

5.04 **Material Considerations**

National Renewables Infrastructure Plan (N-RIP)

The National Renewables Infrastructure Plan (N-RIP), published by Highlands and Islands Enterprise and Scottish Enterprise, describes a number of sites identified for investment that will play a key role in the expanding offshore renewables market.

Ardersier is one of the 11 sites identified within the N-RIP as offering the greatest potential for being involved in offshore wind manufacturing.

N-RIP reports that if these sites are not available, there is a danger that offshore wind developers and wave and tidal manufacturers could source the manufactured equipment for projects from outwith Scotland. If this happens the economic benefit to Scotland will be minimal, despite the country's unrivalled renewable energy generation potential. The economic benefits that these sites could bring to the wider area would be lost.

This risk and the scale of the economic opportunity are the key drivers behind the development of the N-RIP.

UK Marine Policy Statement 2011

The Marine Statement sets out a framework for preparing Marine Plans and taking decisions affecting the marine environment. It aims to achieve a shared vision by the UK Administrations of having 'clean, healthy, safe, productive and biologically diverse oceans and seas'.

The Marine Statement sets out the following high level marine objectives:

- Promote sustainable economic development;
- Enable the UK's move towards a low-carbon economy, in order to mitigate the causes of climate change and ocean acidification and adapt to their effects;
- Ensure a sustainable marine environment which promotes healthy, functioning marine ecosystems and protects marine habitats, species and our heritage assets; and
- Contribute to the societal benefits of the marine area, including the sustainable use of marine resources to address local social and economic issues.

National Marine Plan

Scotland's National Marine Plan (NMP) was published by the Scottish Government in March 2015. The Plan covers the management of both Scottish inshore waters (out to 12 nautical miles) and offshore waters (12 to 200 nautical miles). This Plan

sets out the Scottish Government's policies for the sustainable development of Scotland's seas.

Chapter 4 of the NMP sets out the General Planning Principles (GEN's) necessary to achieve sustainable development. Paragraph 4.4 states that all text within Chapter 4 of the NMP should be considered as planning policy.

Table 5.1 below details the GEN's applicable to this Proposed Development.

Table 5.1: National Marine Plan General Planning Principles

General Planning Principle	Policy Context
GEN 1 General Planning Principle	There is a presumption in favour of sustainable development and use of marine environment when consistent with the policies and objectives of this plan.
GEN 2 Economic Benefits	Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies in this Plan.
GEN 3 Social Benefits	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, when consistent with policies and objectives of this Plan.
GEN 5 Climate Change	Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change.
GEN 7 Landscape/ Seascape	Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account.
GEN 8 Coastal Processes 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 9 Natural Heritage	Development and use of the marine environment must: (a) Comply with legal requirements for protected areas and protected species. (b) Not result in significant impact on the national status of Priority Marine Features. (c) Protect and, where appropriate, enhance the health of the marine area.
GEN 10 Invasive Non-Native Species	Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made.

GEN 11 Marine Litter	Developers, users and those accessing the marine environment must take measures to address marine litter where appropriate. Reduction of litter must be taken into account by decision makers.
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.
GEN 14 Air Quality	Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits.
GEN 17 Fairness	All marine interests will be treated with fairness and in a transparent manner when decisions are being made in the marine environment.
GEN 18 Engagement	Early and effective engagement should be undertaken with the general public and all interested stakeholders to facilitate planning and consenting processes.
GEN 19 Sound Evidence	Decision making in the marine environment will be based on sound scientific and socio–economic evidence.
GEN 21 Cumulative Impacts	Cumulative impacts affecting the ecosystem of the marine plan area should be addressed in decision making and plan implementation.

The NMP also identifies sector specific objectives and policies. Chapter 12 of the NMP relates to shipping, ports, harbours and ferries. The objectives of relevance to the Proposed Development are as follows:

- Safeguarded access to ports and harbours and navigational safety;
- Sustainable growth and development of ports and harbours as a competitive sector, maximising their potential to facilitate cargo movement, passenger movement and support other sectors; and
- Best available technology to mitigate and adapt to climate change, where possible, supporting efficiencies in fleet management and ensuring port infrastructure and shipping services are able to adapt to the consequences of climate change. Consideration of the provision of facilities for shore side power in new developments to allow for this to be provided when markets require it, if it becomes cost effective to do so.

The Marine Planning Policies of relevance to the proposed development are detailed below.

Transport 1: Navigational safety in relevant areas used by shipping now and in the future will be protects.

Transport 2: Marine development and use should not be permitted where it will restrict access to, or further expansion of, major commercial ports or existing or

proposed ports and harbours which are identified as National Developments in the current NPF or as Priorities in the N-RIP.

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.

Transport 5: Port and harbour operations should take into account future climate change and extreme water level projects, and where appropriate take the necessary steps to ensure their ports and harbours remain viable and resilient to a changing climate. Climate and sea level projects should also be taken into account in the design of any new ports and harbours, or of improvements to existing facilities.

Transport 7: Marine and terrestrial planning processes should co-ordinate to provide co-ordinated support to ports, harbours and ferry terminals to ensure they can respond to market influences and provide support to other sectors with necessary facilities and transport links.

References

HM Government (2011) UK Marine Policy Statement

Scottish Government (2014) National Planning Framework 3

Scottish Government (2014) Scottish Planning Policy (SPP)

Scottish Government (2015) National Marine Plan

The Highland Council (2012) Highland Wide Local Development Plan

The Highland Council (2015) Inner Moray Firth Local Development Plan

Highlands and Islands Enterprise and Scottish Enterprise (2010) National Renewables Infrastructure Plan

6.00 Shipping and Navigation

6.01 Introduction

1st Safety Solutions has been appointed by the Applicant to undertake as assessment of vessel movements and navigation requirements associated with the Proposed Development. Ardersier Port Ltd (the Applicant) is a statutory Harbour Authority as defined by the Port of Ardersier Harbour Revision Order 2014 and the Port of Ardersier Harbour Revision (Transfer) Order 2017. Ardersier Port Ltd therefore has statutory and common law duties.

The Port Marine Safety Code (PMSC) and its supporting document 'A Guide to Good Practice on Port Marine Operations' play a vital role in ensuring that there is continual improvement to the Marine Safety Management System by providing pragmatic and a proportionate approach to safety standards, which enable everyone to proportionately apply the principles upon which it is based.

Ardersier Port is required to comply fully with all its duties contained within the above legislation and the PMSC as well as all other statutory requirements. They are also required to ensure that these duties are not compromised during the construction and operational phases of the project.

6.02 Scoping and Consultation

Marine Scotland's Scoping Response required the inclusion of a Shipping and Navigation Chapter within the EIAR. The inclusion of this Chapter was requested by the Maritime and Coastguard Agency.

This Chapter has been prepared in response to the Scoping requirements.

6.03 Potential Effects

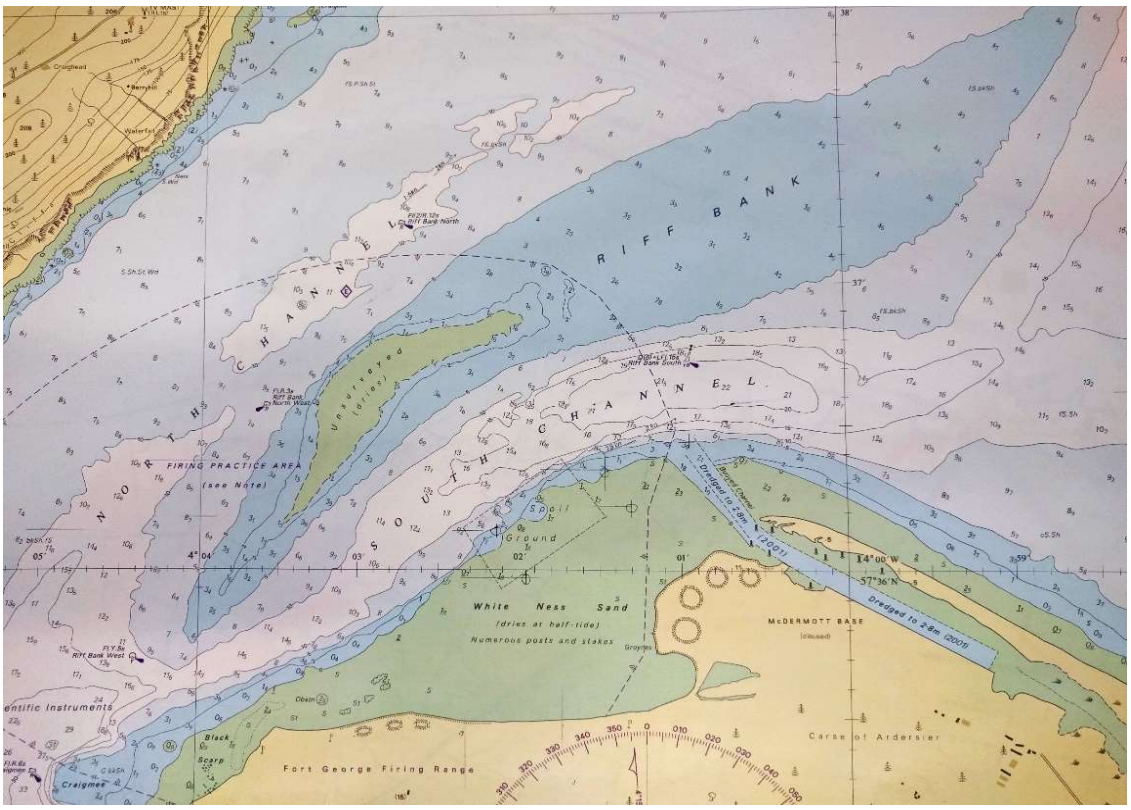
<u>Schedule of Shipping Movements – Construction Phase</u>

Vessel movements during the construction phase will be limited to:

- A cutter suction dredger and its support vessels
- 2/3 vessels delivering materials for the quay wall works.

As shown in Figure 6.1 below, currently most vessels transiting to/from Inverness Harbour and beyond navigate using the North Channel, however the specific dredging area, as detailed in the Extent of Capital Dredging drawing (Technical Appendix 3.4), identifies that the main dredging operations are outwith any existing shipping routes.

Figure 6.1: North and South Shipping Channels - Extract from Admiralty Chart 1077



Schedule of Shipping Movements – Operational Phase

Table 6.1 indicates current shipping routes of vessels transiting to and from the Port of Inverness and beyond.

The estimates below are based on the best current information available taken from the requirements for the BOWL (Beatrice Offshore Windfarm Ltd) and MORL (Moray Offshore Renewables Ltd) consortia for fields based in the Moray Firth. It should be considered that certain permanent construction facilities (particularly the sub-sea elements of the supply chain, such as concrete foundations and steel jacket constructions) may consider other Scottish east coast fields (Inch Cape, Neart na Gaoithe and Firth of the Forth) as potential markets.

The following assumptions have been made, or should be noted when considering these estimates:

- The BOWL and MORL fields are planning to provide 2.8 GW of power capability;
- The estimates assume the use of 6 MW turbines;
- 50% of individual turbines will be founded on concrete gravity structures;
- The installation window is assumed to be 6 months per year (April to September) and therefore a 3 year period is applicable to the immediate fields of BOWL and MORL;
- Stored ballast will be deployed along with the turbine structures and will not create additional ship movements;
- Production of concrete gravity structures will be continuous throughout the year at a rate of approximately 2 per week;
- Importation of construction materials will be by sea and continuous throughout the year;
- Construction materials for concrete gravity structures will equate to 400,000 tonnes of bulk material per year;

- importation of other components (nacelles, blades, towers, transition pieces and cabling) will be continuous throughout the year;
- The Harbour Authority will be required to survey, dredge, maintain navigational marks and provide a pilot service for the operation of the port
- Marine movements within the jurisdiction of the Harbour Authority will be under the control of the Harbourmaster through a Local Port Service with radar assistance in accordance with MGN 401 (M&F) Maritime and Coastguard Agency
- DWT means deadweight in metric tonnes (in board terms the weight of the cargo);
- LOA means the length overall of the vessel;
- Draught means the depth of the underwater part of the vessel in its loaded condition.

Table 6.1: Vessel Movement

Activity	Component/Commodity	Frequency	Port Duration	Size (DWT, LOA. Draught	Ships Per Year
Load-in	Nacelles (10 units per coaster)	2 per month	24 hours	5000 tonnes 100 metres 6 metres	24
Load-in	Blades (8 sets per coaster)	2 per month	12 hours	3000 tonnes 80 metres 4 metres	24
Load-in	Towers (3 sets of three sections)	4 per month	12 hours	3000 tonnes 80 metres 4 metres	48
Load-out Installation	All components in groups of 4 per shipment	6 per month in window 72	72 hours	9000 tonnes 140 metres 8 metres	40
Bulk Imports	Sand, aggregates, Cement, Steel reinforcing	3 per month	24 – 48 hours	10000 tonnes 120 metres 6 metres	40
Export Concrete Foundations	Tug assisted (2) tows to storage or site	8 per month	N/A	4000 tonnes 60 metres 5-6 metres	100
Cable Layers	Interconnectors and main shore cabling	2 per month in window	48 hours	1000 tonnes 60 metres 4-5 metres	12
Supply Vessels	General field support	4 per month in window	Short	Various up to 1000 tonnes	24
24 Other coasters	General	2 per month	24 hours	3000 tonnes 80 metres 4 metres	24
Dredger	Maintenance	4 per year	N/A	3000 tonnes 70 metres 4-5 metres	4
Total					**340***

*340 ships equate to 680 vessel movements (1 into port and 1 out of port)

The estimated vessel movements are dependent on potential future contracts and are subject to vessel type, cargo and frequency amendments but are expected to number approximately 340 inbound and 340 outbound vessel movements giving a total of 680 movements per annum

The main traffic route for passing vessels are journeys to the Port of Inverness and the Ports Annual Report 2017 reports that over the 5 years from 2012 to 2017 there was an annual average of 254 vessel movements inbound and 254 outbound to and from the Port of Inverness. These figures do not include any leisure craft.

6.04 **Cumulative Assessment**

As detailed above, the BOWL and MORL offshore windfarms have been taken into consideration in terms of cumulative effects. Vessel movements associated with other operational ports within the vicinity of Ardersier Port have also been considered. The Proposed Development will result in an increase vessel movements, however it is not considered that this will result in a significant effect in combination with other vessel movements in the area.

6.05 **Mitigation**

Construction Phase

Currently most vessels transiting to/from Inverness Harbour and beyond navigate using the North Channel, however the specific dredging area as defined in drawing number 167112-22A (Technical Appendix 3.4) identifies that the main dredging operations are out with any existing shipping routes.

Detailed risk assessments for the dredging operation will be a requirement of the construction phase health and safety plan as managed by the Principal Contractor for the project and will be reviewed by Ardersier Port Ltd as part of the communication processes of the overall project. The control of the dredger and support vessel movements will be controlled by direct communications between the vessel and Ardersier Port

Risk control measures will include Notices to Mariners as well as notifications to stakeholders which will include various regulatory and statutory bodies such as UK Hydrographic Office and the Maritime and Coastguard Agency. Notices to Mariners will also be issued to for any proposed marine construction works

Detailed Construction and Environmental Management Plans will be produced prior to specific elements of work commencing and will be agreed with SEPA and SNH prior to works starting on site. These will relate to particular individual specific site/aspects of the work and will apply the principals of the agreed mitigation to show how the mitigation is implemented effectively down to the specific site/aspect level. The plans will consider all possible pathways for pollution, and be in accordance with relevant SEPA guidance.

Operational Phase

Prior to commencing operations, Ardersier Port Ltd will develop a formal Marine Safety Management System (MSMS) using modern risk management techniques that will ensure all risks are identified and controlled with the more severe ones either eliminated or reduced to the lowest possible level, so far as is reasonably practicable. Ardersier Port Ltd will consult, as appropriate, those stakeholders likely to be involved in, or affected by the MSMS.

Ardersier Port Ltd will create as required Byelaws and Directions for the efficient management and regulation of the port.

Safety in the port marine environment is not just a matter for the organisation, its employees, or contractors. Port users are also required to minimise risk to themselves and others, in doing so they must be able to put forward to the organisation their views on the development of appropriate safety policies and procedures. It follows therefore that Ardersier Port Ltd will consult, as appropriate with two main groups: marine users, both commercial and leisure, and local interests and communities.

Aids to navigation have been identified as a required risk control measure and as such have been granted a Statutory Sanction of the Commissioners of Northern Lighthouses for the placement of navigation buoys to the entrance channel to Ardersier Port. The positioning of the aids to navigation cannot be compromised by any land-based structure.

Ardersier Port Ltd will appoint competent persons who will include a:

- Harbourmaster who has day-to-day responsibility for managing the safe operation of navigation and other marine activities in the Port and its approaches;
- Designated person to provide independent assurance about the operation of an organisation's MSMS.

Control of Shipping

The risk assessment approach to the control of shipping will identify numerous control measures and will include the:

- installation of VHF Radio and the use of other systems that will provide robust communications between Ardersier Port and vessels;
- identifying safe anchorages for vessels who are not ready or able to enter the Port;
- provision of aids to navigation in accordance with the Northern Lighthouse Boards Statutory Sanction;
- lighting of the Port that will be designed, and constructed in accordance with relevant British Standards including BS 5489-8 Code of Practice on Road Lighting. Lighting for roads with special requirements.

6.06 **Statement of Significance**

Based on the current and historical vessel movements passing the proposed project site and the location of the dredging operation there is no increased risks to the safe navigation of vessels from the construction project phase.

The risk management of the safe navigation of vessels using Ardersier Port will be fully encompassed within the final Marine Safety Management System which will be managed by the Harbourmaster and audited on an ongoing basis by the Designated Person.

References

Maritime and Coastguard Agency (2009) Marine Guidance Note 401 Vessel Traffic Services and Local Port Services in the UK

British Standard 5489-8 Code of Practice in Road Lighting

Transport Scotland (2014) The Port of Ardersier Harbour Revision Order

Transport Scotland (2017) The Port of Ardersier Harbour Revision Order Transfer

Port of Inverness (2012 – 17) Annual Reports

Department for Transport and Maritime Coastguard Agency (2016) Port Marine Safety Code

Department for Transport and Maritime Coastguard Agency (2018) A Guide to Good Practice on Port Maritime Operations

7.00 Terrestrial Ecology/Ornithology

7.01 Introduction

EnviroCentre Ltd was commissioned by the Ardersier Port Ltd. to undertake an Ecological Impact Assessment (EcIA) of the proposed development, in order to identify and describe any likely significant effects arising from it.

This chapter of the EIAR details the specialist terrestrial ecology and ornithology work 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) by experienced and competent ecologists who are all Members of CIEEM and follow its Code of Professional Conduct.

The purpose of this chapter is to:

- Identify and describe all potentially significant ecological effects associated with the proposed development;
- Set out the mitigation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- Identify how mitigation measures will be secured;
- Provide an assessment of the significance of any residual effects;
- Set out the requirements for post-construction monitoring.

This chapter is supplemented by the following information contained within the EIAR:

- Technical Appendix 7.1: Ecological Impact Assessment – Terrestrial Ecology & Ornithology
- Technical Appendix 7.2: Protected Species Survey Report
- Technical Appendix 7.3: The Habitats and Vegetation (NVC) of Ardersier Port proposed for Development, by Theo Loizou
- Technical Appendix 7.4: Whiteness Head, Ardersier Port; Ecological Assessment: Lichens, by Andy Acton, Brian Coppins & Heather Paul
- Technical Appendix 7.5: Breeding Bird Survey Report
- Technical Appendix 7.6: Habitats Regulations Appraisal
- Technical Appendix 7.7: Natural Heritage Management Plan.

7.02 Scoping and Consultation

In order to finalise and agree the scope of the EcIA, a Scoping Report was prepared and a Scoping Request was submitted to The Highland Council (THC) and other relevant stakeholders in March 2018 and to Marine Scotland in April 2018. Scoping opinions were received from each statutory body in June and July respectively.

Based on the results of the Environmental Statement (ES) undertaken in 2013 and a consultation exercise, the scope of the terrestrial ecology and ornithology survey work is summarised below:

- Phase I Habitat Survey
- Groundwater Dependent Terrestrial Ecosystem (GWDTE) Survey
- National Vegetation Classification (NVC) Survey
- Lichen Survey
- Protected Species Survey (Otter, Water Vole, Badger, Great Crested Newt, bats (all species)
- Breeding Bird Survey
- Summer Foraging and Roosting Counts
- Non-breeding / Wintering Bird Survey

The scoping exercise and fieldwork data narrowed down the Important Ecological Features (IEFs) and their importance (see Table 7.1) and zone of influence.

Table 7.1: Important Ecological Features (IEF)

IEF	Importance	Zone of Influence
Moray Firth pSPA	International	The Proposed Development lies within the pSPA. Small areas of habitat lie within the capital dredge area. Qualifying species are found within and adjacent to the Proposed Development.
Inner Moray Firth SPA	International	The Proposed Development lies within the SPA. Small areas of habitat lie within the capital dredge area. Qualifying species are found within and adjacent to the Proposed Development.
Whiteness Head SSSI	National (UK)	The Proposed Development lies within the SSSI. Small areas of habitat lie within the capital dredge area. Qualifying species are found within and adjacent to the Permitted Development.
Coastal sand dunes	International	Small areas of habitat lie within the capital dredge area. Also found within and adjacent to the Proposed Development.
Coastal vegetated shingle	International	Small areas of habitat lie within the capital dredge area. Also found within and adjacent to the Proposed Development.
Lecania granulata	International	Within the Whiteness Head SSSI (on the spit adjacent to the Proposed Development).
Lichen Assemblage (*Acarospora veronensis, Bacidia saxenii, Micaria coppinsii, Micaria misella, Pronectria robergei, Pyrenidium actinellum*)	Regional	Within the dredge zone of the Proposed Development.
Otter	International	Within the wider Ardersier Port area (adjacent to and within the Proposed Development).
Red-throated Diver	International	Within the Moray Firth (adjacent to the Proposed Development).
Arctic Tern	International	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Common Tern	International	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Sandwich Tern	International	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).

IEF	Importance	Zone of Influence
Bar-tailed Godwit	International	Within the Whiteness Sands SSSI (adjacent to the Proposed Development).
Whooper Swan	International	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Golden Plover	International	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Black-tailed Godwit	National (UK)	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Common Scoter	National (UK)	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Eurasian Curlew	National (UK)	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Long-tailed Duck	National (UK)	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Ringed Plover	National (UK)	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
European Shag	National (UK)	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).
Dunlin	National (Scotland)	Within the Moray Firth and Whiteness Head SSSI (adjacent to the Proposed Development).

7.03 **Potential Effects**

The key sources of impacts that are predicted to result in terrestrial ecological or ornithological effects have been identified as follows:

Construction Phase

- Dredging of the spit would result in habitat loss;
- Dredging may create noise and visual disturbance, sediment dispersal, and potential pollution of the waterbody (fuel leaks and spills);
- The stockpiling of dredged material has the potential to cause disturbance to birds foraging or roosting on Whiteness Sands;
- Vibropiling for the construction of the quay wall would create noise and visual disturbance and potential pollution of the waterbody (fuel leaks and spills); and
- Construction activities including: access and travel on/off site; plant maintenance and storage of fuels and chemicals; movement of materials to/from site, have the potential to create above ground noise and vibration, pollution to the waterbody due to fuel leaks and spills, sediment runoff and light pollution, and construction and engineering works to establish new buildings and infrastructure.

Operational Phase

- Maintenance dredging may cause noise and visual disturbance and sediment dispersal; and
- An increase in vessel movement may cause noise and visual disturbance and an increased pollution risk (fuel leaks and spills / sediment runoff / erosion).

Negative Construction and Operational Impacts

Table 7.2 below summarises the negative construction and operational impacts and their effect significance after consideration of relevant design mitigation and additional mitigation measures.

The success of the mitigation and monitoring is assessed as certain/near certain: probability estimated at 95% chance or higher.

Positive Construction and Operational Impacts

Table 7.2 below summarises the positive construction impacts and their effect significance.

7.04 **Cumulative Assessment**

Due to the localised nature of the works and the distance from the site, the Proposed Development in association with the projects identified in the cumulative effects section of Chapter 2, is not predicted to impact any terrestrial ecological or ornithological IEFs.

7.05 **Mitigation**

The standard mitigation measures outlined within the EcIA (Technical Appendix 7.1) will be adhered to during the construction and operational phases of the proposed development.

7.06 **Statement of Significance**

Following the effective implementation of mitigation measures, which have been designed following review of the engineering design and construction techniques, significant adverse effects from the construction phase will be suffered by the Lichen Assemblage. These effects are as a result of the habitat loss during the proposed capital dredge, and are assessed as of Local significance.

Adverse effects on all other IEFs pertaining to terrestrial ecology and ornithology will not be significant. Relevant legislation and planning policies will be adhered to, and local and UKBAP targets will remain unaffected, and the integrity of all designated sites will remain intact.

This EcIA concludes that there are also significant positive effects from the construction phase will benefit qualifying species of the locally designated sites, and bird aggregations in the area, through the creation of a new island which will enable birds to roost, and potentially breed, without disturbance or land predation. These effects are assessed as of Regional significance.

Table 7.2: Summary of negative construction and operational impacts

IEF	Importance of IEF	Sensitivity of IEF	Nature of Impact	Duration of Impact	Magnitude of Impact	Significance of Effect and Level of Significance	Four Point Scale Assessment	Confidence in Assessment
Construction Phase (Negative)								
Moray Firth pSPA	International	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high
Inner Moray Firth SPA	International	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high
Whiteness Head SSSI	National (UK)	Low	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Temporary Permanent	Low	Not significant	Not strongly negative	A: high

IEF	Importance of IEF	Sensitivity of IEF	Nature of Impact	Duration of Impact	Magnitude of Impact	Significance of Effect and Level of Significance	Four Point Scale Assessment	Confidence in Assessment
Coastal Sand Dunes	International	Low	Habitat loss	Permanent	Low	Not significant	Not strongly negative	A: high
Coastal Vegetated Shingle	International	Low	Habitat loss	Permanent	Low	Not significant	Not strongly negative	A: high
Lecania granulata	International	Low	Habitat loss	Permanent	Negligible	Not significant	Not strongly negative	B: intermediate
Lichen Assemblage *(Acarospora veronensis, Bacidia saxenii, Micaria coppinsii, Micaria misella, Pronectria robergei, Pyrenidium actinellum)*	Regional	Low	Habitat loss	Permanent	Moderate	Significant - Local	Not strongly negative	A: high
Otter	International	Low	Noise & Visual disturbance	Temporary	Low	Not significant	Not strongly negative	A: high
Red-throated Diver	International	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high

IEF	Importance of IEF	Sensitivity of IEF	Nature of Impact	Duration of Impact	Magnitude of Impact	Significance of Effect and Level of Significance	Four Point Scale Assessment	Confidence in Assessment
Arctic Tern	International	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high
Common Tern	International	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high

IEF	Importance of IEF	Sensitivity of IEF	Nature of Impact	Duration of Impact	Magnitude of Impact	Significance of Effect and Level of Significance	Four Point Scale Assessment	Confidence in Assessment
Sandwich Tern	International	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high
Bar-tailed Godwit	International	Negligible	• Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high
Whooper Swan	International	Negligible	• Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high
Golden Plover	International	Negligible	• Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high
Black-tailed Godwit	National	Negligible	• Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high

IEF	Importance of IEF	Sensitivity of IEF	Nature of Impact	Duration of Impact	Magnitude of Impact	Significance of Effect and Level of Significance	Four Point Scale Assessment	Confidence in Assessment
Common Scoter	National	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high
Eurasian Curlew	National	Negligible	• Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high
Long-tailed Duck	National	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high
Ringed Plover	National	Negligible	• Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high

IEF	Importance of IEF	Sensitivity of IEF	Nature of Impact	Duration of Impact	Magnitude of Impact	Significance of Effect and Level of Significance	Four Point Scale Assessment	Confidence in Assessment
European Shag	National	Negligible	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high
Dunlin	National	Negligible	• Noise & Visual disturbance • Pollution / Contamination • Habitat loss	Temporary Temporary Permanent	Negligible	Not significant	Not strongly negative	A: high
Construction Phase (Positive)								
• Bird aggregations • Designated sites	International	Low	Creation of island	Temporary	Moderate	Significant - Regional	Strongly positive	B: intermediate
Operational Phase (Negative)								
• Bird aggregations • Designated sites	International	Low	Sand blow from stockpiled material	Temporary	Low-Negligible	Not significant	Not strongly negative	B: intermediate
All IEFs	Local - International	Low	• Dredging (increased turbidity and sedimentation) • Noise & Visual disturbance • Pollution / Contamination	Temporary Temporary Temporary	Negligible	Not significant	Not strongly negative	A: high

References

Port of Ardersier Ltd (2013) Volume 2 Environmental Statement for Establishment of Port and Port Related Services for Energy Related Use at Former Fabrication Yard, Ardersier.

For full list of references, please refer to the Terrestrial Ecology and Ornithology Ecological Impact Assessment contained in Technical Appendix 7.1.

8.00 Marine Ecology

8.01 Introduction

EnviroCentre Ltd was commissioned by the Applicant to undertake a Marine Ecological Impact Assessment (EcIA) of the Proposed Development, in order to identify and describe any likely significant effects.

This Chapter of the EIAR details the specialist marine 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) by experienced and competent ecologists who are all Members of CIEEM and follow its Code of Professional Conduct.

The purpose of this chapter is to:

- Identify and describe all potentially significant ecological effects associated with the Proposed Development
- Set out the mitigation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects
- Identify how mitigation measures will be secured
- Provide an assessment of the significance of any residual effects
- Set out the requirements for post-construction monitoring

This chapter is supplemented by the following information contained within the EIAR:

- Technical Appendix 8.1: Marine Ecology EcIA
- Technical Appendix 8.2: Marine Mammal Protection Plan (MMPP)
- Technical Appendix 8.3: Intertidal and Benthic Ecology, and
- Chapter 10: Underwater Noise

8.02 Scoping and Consultation

As detailed in Chapter 2 of the EIAR, a Scoping request was submitted to The Highland Council and Marine Scotland. A summary of the relevant scoping responses is provided within the Marine EcIA (Technical Appendix 8.1).

Based on the results of the Environmental Statement (ES) undertaken in 2013, the proposed scope of the Marine EcIA included the following:

- Designated sites
- Marine mammals
- Salmonids
- Marine fish; and
- Intertidal and subtidal habitats, benthic fauna and vegetation.

The Scoping exercise narrowed down the Important Ecological Features (IEFs). The zone of influence has been set for each Feature (see Table 8.1).

Table 8.1: Important Ecological Features (IEF)

IEF	Zone of Influence
Moray Firth SAC	Within the furthest extent from the proposed development where underwater noise affects bottlenose dolphin.
Dornoch Firth and Morrich More SAC	Within the furthest extent from the proposed development where underwater noise affects harbour seals within the Moray Firth that frequent the Dornoch Firth and Morrich More SAC.
River Moriston SAC	Within the migratory path to the River Moriston SAC through or adjacent to the proposed development.
Ardersier Seal Haul-Out	Within the seal haul-out boundary located partially within the proposed development.
Harbour porpoise	Within the Moray Firth (adjacent to the proposed development) and the furthest extent of where underwater noise affects harbour porpoise.
Bottlenose dolphin	Within the Moray Firth (adjacent to the proposed development) and the furthest extent from the proposed development where underwater noise affects dolphin species.
Common dolphin	Within the Moray Firth (adjacent to the proposed development) and the furthest extent of where underwater noise affects dolphin species.
Minke whale	Within the Moray Firth (adjacent to the proposed development) and the furthest extent of where underwater noise affects whale species.
Grey seal	Within the Moray Firth (adjacent to the proposed development) and the furthest extent of where underwater noise affects seal species.
Harbour seal	Within the Moray Firth (adjacent to the proposed development) and the furthest extent of where underwater noise affects seal species.
Atlantic salmon	Within the migratory path to the River Ness, River Moriston SAC and River Beauly through or adjacent to the proposed development.
Sea trout	Within the migratory path to the River Ness, River Moriston SAC and River Beauly through or adjacent to the proposed development.
Intertidal and Benthic Habitats and Ecology	Within the capital dredge area of the proposed development.

8.03 **Potential Effects**

The key sources of impacts that are predicted to result in marine ecological effects have been identified as follows:

<u>Construction Phase</u>

- Dredging of the spit would result in habitat loss
- Dredging would create underwater noise, sediment dispersal, the potential spread of Invasive Non-Native Species (INNS), and potential pollution of the waterbody (fuel leaks and spills)
- Dredging and the placement of spoil have the potential to cause disturbance to seals within the designated seal haul-out, partially within and adjacent to the site;
- Vibropiling for the construction of the quay wall would create underwater noise and potential pollution of the waterbody (fuel leaks and spills), and

- Construction activities including: access and travel on/off site; plant maintenance and storage of fuels and chemicals; and movement of materials to/from site; have the potential to create above ground noise and vibration, pollution to the waterbody due to fuel leaks and spills, sediment runoff and light pollution.

Operational Phase

- Maintenance dredging would cause underwater noise and sediment dispersal; and
- An increase in vessel movement would cause underwater noise and increased collision risk.

Negative Construction and Operational Impacts

Table 8.2 summarises the negative construction and operational impacts and their effect significance after consideration of relevant design mitigation and additional mitigation measures.

The success of the above mitigation and monitoring is assessed as certain/near certain: probability estimated at 95% chance or higher.

Table 8.2: Summary of negative construction and operational impacts

Construction Phase							
IEF	Importance	Impact	Duration of Impact	Magnitude of Impact	Significance of Effect	Four-point scale	Confidence
Moray Firth SAC	International	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Dornoch Firth and Morrich More SAC	International	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
River Moriston SAC	International	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Atlantic salmon and Sea trout	National	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Harbour porpoise	International	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Bottlenose Dolphin	International	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high

Common dolphin	International	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Minke whale	International	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Grey seal	County/Metro politan	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Harbour seal	County/Metro politan	Dredging (increased turbidity and sedimentation)	Temporary	Negligible	Not significant	Not highly negative	A: high
Moray Firth SAC	National (Scotland)	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
Dornoch Firth and Morrich More SAC	National (Scotland)	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
River Moriston SAC	International	Underwater noise (piling and dredging)	Temporary	Negligible	Not significant	Not highly negative	A: high
Atlantic salmon and Sea trout	National	Underwater noise (piling and dredging)	Temporary	Negligible	Not significant	Not highly negative	A: high
Harbour porpoise	International	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
Bottlenose dolphin	International	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
Common dolphin	International	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
Minke whale	International	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
Grey seal	County/Metro politan	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
Harbour seal	County/Metro politan	Underwater noise (piling and dredging)	Temporary	Low	Not significant	Not highly negative	A: high
Moray Firth SAC	International	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A: high
Dornoch Firth and Morrich More SAC	International	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A: high

Atlantic salmon and Sea trout	National	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A: high
Harbour porpoise	International	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A: high
Bottlenose dolphin	International	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A: high
Common dolphin	International	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A: high
Minke whale	International	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A: high
Grey seal	County/Metro politan	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A:high
Harbour seal	National	Pollution to water	Temporary	Negligible	Not significant	Not highly negative	A:high
Harbour and Grey seal	National and County/Metro politan respectively	Disturbance to seals at Haul-out	Temporary	Low	Not significant	Not highly negative	A: high
Moray Firth SAC (subtidal sandbanks)	International	Loss of habitat	Permanent	Negligible	Not significant	Not highly negative	A: high
Subtidal and intertidal habitats	International	Loss of habitat	Permanent	Negligible	Not significant	Not highly negative	A: high

Operational Phase							
Feature	Importance	Impact	Duration of Impact	Magnitude of Impact	Significance of Impact	Four-point scale	Confidence
Moray Firth SAC	International	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high
Dornoch Firth and Morrich More SAC	International	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high
River Moriston SAC	International	Maintenance dredging	Temporary	Negligible	Not significant	Not highly negative	A: high
Atlantic salmon and Sea trout	National	Maintenance dredging	Temporary	Negligible	Not significant	Not highly negative	A: high
Harbour porpoise	International	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high
Bottlenose dolphin	International	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high
Common dolphin	International	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high
Minke whale	International	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high
Grey seal	County/Metro politan	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high

Harbour seal	County/Metro politan	Maintenance dredging	Temporary	Low	Not significant	Not highly negative	A: high
Moray Firth SAC	International	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
Dornoch Firth and Morrich More SAC	International	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
River Moriston SAC	International	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
Atlantic salmon and Sea trout	National	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
Harbour porpoise	International	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
Bottlenose dolphin	International	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
Common dolphin	International	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
Minke whale	International	Increased vessel movement	Permanent	Negligible	Not significant	Not highly negative	A: high
Grey seal	County/Metro politan	Increased vessel movement	Permanent	Low	Not significant	Not highly negative	A: high
Harbour seal	County/Metro politan	Increased vessel movement	Permanent	Low	Not significant	Not highly negative	A: high
Subtidal and intertidal habitats	International	Loss of habitat	Permanent	Negligible	Not significant	Not highly negative	A: high

Positive Construction and Operational Impacts

No positive construction or operational impacts from the Proposed Development are predicted.

8.04 **Cumulative Assessment**

From the sites identified in the cumulative effects section of Chapter 2, the Proposed Development is not predicted to add to the associated impacts from any of these sites, due to the localised nature of the works and the distance of the sites.

8.05 **Mitigation**

The standard mitigation measures outlined within the EcIA (Technical Appendix 8.1) will be adhered to during the construction and operational phases of the proposed development.

8.06 **Statement of Significance**

This EcIA concludes that, following the effective implementation of mitigation measures, which have been designed following review of the engineering design and construction techniques, adverse effects on marine ecological IEFs will not be significant. Relevant legislation and planning policies would be adhered to and local

and UK Biodiversity Action Plan targets would remain unaffected. The integrity of the Moray Firth SAC, Dornoch and Morrich More SAC and the River Moriston SAC would remain intact.

References

Port of Ardersier Ltd (2013) Volume 2 Environmental Statement for Establishment of Port and Port Related Services for Energy Related Use at Former Fabrication Yard, Ardersier.

For full list of references, please refer to the Marine Ecological Impact Assessment contained in Technical Appendix 8.1.

9.00 Airborne Noise and Groundborne Vibration

9.01 Introduction

Waterman Infrastructure & Environment Ltd has been appointed by the Applicant to prepare an update to the Chapter they prepared for the 2013 ES, to take into consideration the most recent proposal and legislative changes since 2013.

This Chapter assesses the likely significant noise and vibration impacts of the Proposed Development in relation to airborne noise and ground borne vibration. Underwater Noise is addressed in Chapter 10. In particular, this Chapter considers the potential impacts of noise and vibration during the construction works and on completion of the development upon the surrounding sensitive receptors.

Information relating to the noise and vibration assessment is contained within the following Technical Appendices:

- Technical Appendix 9.1: Glossary of Acoustic Terms
- Technical Appendix 9.2: Baseline Noise Survey
- Technical Appendix 9.3: Construction Noise Assessment
- Technical Appendix 9.4: Road Traffic Noise Assessment

9.02 Scoping and Consultation

The Scoping Response received from The Highland Council Environmental Health Department requested that an updated noise assessment was undertaken. It was confirmed at the Scoping stage that updated baseline noise monitoring was not required.

This assessment of potential significant noise and vibration impacts is based on the following:

- Identification of noise sensitive receptors within the vicinity of the Site and assess its level of sensitivity;
- Establishment of prevailing baseline noise conditions at selected noise sensitive receptors;
- Noise and vibration assessment of predicted noise levels during construction operations associated with the Proposed Development;
- Determination of design aims for plant and services to be located on, or within, the proposed new buildings at the Site;
- Noise and vibration assessment of operational noise level associated with the Proposed Development, including changes in traffic volumes as a result of the Proposed Development;
- Development of preliminary mitigation proposals, where appropriate, and
- Assessment of the significance of any residual effects.

9.03 **Methodology**

Construction Impact Assessment – Noise

At this stage of the project, a detailed programme of construction is not available, however based on experience, the main phases which are considered to be the noisiest are:

- Dredging
- Earth works
- Piling
- Concreting
- Pavement / Asphalt

It is estimated at this stage that construction works will be phased over a 24 month period and there is the potential for construction noise and vibration to impact on Noise Sensitive Receptors (NSRs) within the vicinity of the development. Specific detail on the type of plant is not available at this stage therefore construction noise levels are based on generic plant detail contained within BS5228-1:2009.

Calculations were carried out in accordance with the methodology prescribed within BS 5228-1:2009. Calculations representing a worst-case scenario over a one hour period with plant operating at the closest point to the nearest NSR and in the absence of mitigation are presented. In practice, noise levels would tend to be lower owing to greater separation distances and screening impacts.

To assess the potential impacts of construction noise on existing Noise Sensitive NSRs, 'The ABC Method' provided in BS5228 - 1:2009 defines category threshold values which are determined by the time of day and existing monitored ambient noise levels. The noise level generated by construction activities, corrected to take into account the existing monitored ambient noise levels (i.e. the total noise level), is then compared with the 'threshold value'. If the total noise level exceeds the 'threshold value', a significant impact is deemed to occur.

To allow greater definition of the significance of the potential impacts, the criteria in Table 9.1 was adopted.

Table 9.1: Construction Noise Significance Criteria

Impact Significance	Level above threshold value dB(A)	Definition
Negligible	< 0	The impact is not of concern.
Minor adverse	0.1 to 4.9	The impact is undesirable but of limited concern.
Moderate adverse	5.0 to 9.9	The impact gives rise to some concern but is likely to be tolerable depending on scale and duration.
Substantial adverse	> 10	The impact gives rise to serious concern and it should be considered unacceptable.

Construction Impact Assessment - Vibration

Two types of vibration impacts have been considered:

- The impacts on people or equipment within buildings; and
- The impacts on buildings (or other structures) themselves.

There are currently no British Standards that provide a methodology for predicting levels of vibration from construction activities other than BS5228-2:2009, which relates to percussive or vibratory rolling and piling only. At this stage, specific detail on activities that give rise to vibration are not known, although some form of piling may be required.

Table 9.2 presents the distance from vibratory piling activities that may give rise to complaints and cosmetic damage. This is only indicative and is dependent on ground conditions and state of operation for vibratory piling.

Table 9.2: Distance from Vibratory Piling when Cosmetic Damage & Complaints May Arise

Probability of exceedance of criteria at given distance	Distance at which vibration levels are predicted to drop to below 12.5mm/s	Distance at which vibration levels are predicted to drop to below 1mm/s
50%	-	20m
33%	-	40m
5%	10m	60m

Further to the above, Table 9.3 presents the distance at which excavation activities and operation of heavy vehicles is likely to give rise to a just perceptible level of vibration. These have been obtained from historical field measurements previously undertaken by Waterman Infrastructure + Environment Ltd. It is generally accepted that for the majority of people, vibration levels of 0.14 mm/s peak particle velocity (PPV) are just perceptible with complaints likely at 1 mm/s (PPV). Below 12.5 mm/s (PPV) the probability of cosmetic damage tends towards zero.

Table 9.3: Distance of Perceptible Vibration from Construction Activities

Construction Activity	Distance from Activity when Vibration may just be Perceptible (m)
Excavation	10-15
Auger Piling	15-20
Heavy Vehicles	5-10

At this stage in the design process, insufficient detail is available on the methods and equipment to be used during the construction works. Consequently, the significance of vibration impacts arising from such works cannot be assessed quantitatively.

Completed Development Impact Assessment

Technical Advice Note 2011 (TAN) to Planning Advice Note 1/2011 'Noise' (PAN 1) presents a five stage noise assessment methodology which is applicable to both noise generating developments (NGDs) and noise sensitive developments (NSDs). As the proposed development is considered an NGD, the relevant procedure will be followed as detailed below.

Where industrial developments are proposed affecting existing noise sensitive premises, the TAN recommends an assessment based on the principles described in BS4142:2014 however does not adhere to the BS 4142:2014 method of evaluation. The document describes a methodology to determine the sensitivity of receptors using the values detailed in Table 9.4.

Table 9.4: Receptor Sensitivity Criteria (Site Operational Noise)

x = BS 4142 Rating Level ($L_{Ar,Tr}$) Minus Monitored Background Level ($L_{A90,T}$)	Sensitivity of Receptor
x <5	Low
5 ≤ x <10	Medium
x ≥10	High

Table 9.5 provides the criteria used to define the magnitude of noise impacts where a noise generating development is expected to affect noise sensitive receptors.

Table 9.5: Operational Noise Magnitude of Noise Impact

Change in Noise Level dB $L_{Aeq,T}$	Magnitude
0.1 to 0.9	Negligible
1 to 2.9	Minor adverse
3 to 4.9	Moderate adverse
≥5	Major adverse

Once the sensitivity of the receptors has been determined and the change in noise level has been predicted, Table 9.6 can be used to determine the significance of any noise impacts from the operation of the development.

Table 9.6: Operational Noise Significance Criteria

Magnitude of Impact (Reference Table 9.)	Sensitivity of Receptor Based on Likelihood of Complaint x = Rating ($L_{Ar,Tr}$) – Background ($L_{A90,T}$)) dB (reference Table 9.)		
	Low (x<5)	Medium (5 ≤ x <10)	High (x ≥10)
Major (≥5)	Slight / Moderate	Moderate / Large	Large / Very Large
Moderate (3 to 4.9)	Slight	Moderate	Moderate / Large
Minor (1 to 2.9)	Neutral / Slight	Slight	Slight / Moderate
Negligible (0.1 to 0.9)	Neutral / Slight	Neutral / Slight	Slight
No change (0)	Neutral	Neutral	Neutral

For the purposes of this EIAR, the criteria detailed in Table 9.6 can be translated to the overall significance criteria in Table 9.7 and the relative effect on the decision making process for the Proposed Development.

Table 9.7: Significance Criteria Relating to the Planning Decision process

Operational Noise Significance Criteria	Interpretation in Terms of Decision Making Process
Very Large	These effects represent key factors in the decision-making process. They are generally, but not exclusively associated with impacts where mitigation is not practical or would be ineffective.
Large	These effects are likely to be important considerations but where mitigation may be effectively employed such that resultant adverse effects are likely to have a Moderate or Slight significance.
Moderate	These effects, if adverse, while important, are not likely to be key decision making issues.
Slight	These effects may be raised but are unlikely to be of importance in the decision making process.
Neutral	No effect, not significant, noise need not be considered as a determining factor in the decision making process.

Traffic Assessment

In addition to the methodology presented above the TAN recommends that the significance of impact arising from vehicle movements is assessed based on the change in the prevailing noise level. In the example given the change in noise level is based on the LA10 noise parameter, which is the accepted parameter for the assessment of road traffic noise. The Calculation of Road Traffic Noise (CRTN:1988) predictive methodology is used, except where hourly flows are less than 50. Under these conditions, which is applicable to the proposed development, BS 5228 predictive methodology is used to determine the LAeq,1h. The change in the prevailing noise level with the development is then used to determine the significance of the impact.

The initial process for the assessment requires the assigning of sensitivity to receptors, as with the assessment of operational noise detailed previously. Table 9.8 details the method to determine receptor sensitivity for increased road noise incident on designated quiet areas within an agglomeration, however these criteria are also considered appropriate for this assessment.

Table 9.8: Receptor Sensitivity Criteria (Traffic Noise)

Existing Noise Condition Across 50% of Receptor Area (dB $L_{Aeq,16h}$)	Sensitivity of Receptor
x >55	Low
50 ≤ x ≤ 55	Medium
x < 50	High

Table 9.9 presents the significance criteria for change in the prevailing noise level due to potential increases in vehicle flows. Calculations will be carried out in accordance with the methodology outlined in Calculation of Road Traffic Noise (CRTN) as described below.

Table 9.9: Traffic Noise Magnitude of Noise Impact

Change in Ambient Noise Level dB $L_{Aeq,1h}$	Magnitude
0	No change
0.1 to 0.9	Negligible
1 to 2.9	Minor
3 to 4.9	Moderate
≥5	Major

Once the sensitivity of the receptors has been determined from the figures provided in Table 9.9 and the change in noise level has been predicted, Table 9.10 can be used to determine the significance of any noise impacts from the operation of the Proposed Development.

Table 9.10: Traffic Noise Significance Criteria

Magnitude of Impact (Reference Table 9.)	Sensitivity of Receptor Based on Existing Noise Level within area >50% of QA, x = $L_{Aeq,16h}$ dB (reference Table 9.)		
	Low (x>55)	Medium (50 ≤ x <55)	High (x <50)
Major (≥5)	Slight / Moderate	Moderate / Large	Large / Very Large
Moderate (3 to 4.9)	Slight	Moderate	Moderate / Large
Minor (1 to 2.9)	Neutral / Slight	Slight	Slight / Moderate
Negligible (0.1 to 0.9)	Neutral / Slight	Neutral / Slight	Slight
No change (0)	Neutral	Neutral	Neutral

For the purposes of this report, the criteria detailed in Table 9.9 can be translated to the overall significance criteria in Table 9.10 and the relative effect on the decision making process for the development.

Limitations and Assumptions

At this stage in the design process specific detail on the plant associated with each phase of construction is not known. Generally, this level of detail does not become available until the build out contract is let. The assessment is therefore based upon detailed knowledge of generic construction plant compliments associated with the 'noisiest' construction phases. In this respect, a medium to high degree of confidence is assigned to the predicted construction significance levels.

With regards to the operational phase of the Proposed Development, calculations are based upon current national and local guidance, information provided by similar tenants to the ones for this Site and previous experience of similar sites. Provided the recommendations contained within this report are adhered to it is considered that a medium to high confidence in predicted significance levels can be assigned for the operational phase of the development.

9.04 **Legislation, Planning Policy and Guidance**

National Planning Policy

The Environmental Noise (Scotland) Regulations 2006

The Environmental Noise (Scotland) Regulations 2006 transpose the European Directive 2002/49/EC (the Environmental Noise Directive) into Scottish Law. The Regulations affect large urban areas; major transport corridors and major airports. They require Scottish Ministers and airport authorities to manage noise through a process of strategic noise mapping and noise action plans. In the areas affected by the Regulations, planning authorities have a role in helping to prevent and limit the adverse effects of environmental noise.

Control of Pollution Act, 1974

Part III of the Control of Pollution Act 1974 (CoPA) is specifically concerned with pollution. With regards to noise, it covers construction sites; noise in the street; noise abatement zones; codes of practice and Best Practicable Means (BPM).

Planning Advice Note 1: Planning and Noise (2011)

Planning Advice Note (PAN) 1 supersedes Circular 10/1999 'Planning and Noise' and PAN 56 'Planning and Noise' which are now revoked. PAN 1 provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. Information and advice on noise impact assessment (NIA) methods is provided in the associated Technical Advice Note entitled 'Assessment of Noise', which includes details of the legislation, technical standards and codes of practice for specific noise issues.

With regard to construction sites, PAN 1 advises that noise is most effectively controlled through the Control of Pollution Act 1974 and the Pollution and Prevention Control Act 1999 for relevant installations. Notice can be served in advance of works and site conditions set to control activities.

PAN 1 advises that road traffic noise impact assessments should take account of level, potential vibration, disturbance and variation in noise levels throughout the day, the pattern of vehicle movements and the configuration of the road system. When upgrading existing roads it considers it sufficient to base noise assessments on the current measured noise levels.

With regard to industrial developments the guidance states that industrial noise is generally difficult to assess due to its variable character. It highlights that it may be necessary to undertake the assessment for different periods of the day which correspond to operational hours of the Development thereby taking account of the variation in the diurnal variation in background noise levels.

Technical Advice Note – Assessment of Noise (2011)

This Technical Advice Note (TAN 2011) provides guidance to assist in the technical evaluation of noise assessments. It clearly states that it does not offer prescriptive guidance on noise assessment nor should it be considered as being exhaustive in extent. It aims to assist in assessing the significance of impact the relevant details of

which are discussed within the Assessment Methodology and Significance Criteria section of this Chapter.

In Appendix 1 to the TAN, the document provides a summary of relevant technical standards, guidance and codes of practice which may be used to facilitate the decision making process involving noise issues.

The guidance provided within the TAN advises that assessment of noise impact should be in the context of changes in the acoustic environment resultant from the Development in both quantitative and qualitative terms. The importance of using the appropriate noise metric, together with the assessment period (day, night, relevant hour) are also highlighted. The TAN reports the daytime period as between 07:00 – 23:00 and the night-time period between 23:00 – 07:00.

Guidance

British Standard (BS) 8233: Guidance on Sound Insulation and Noise Reduction for Buildings, 2014

BS 8233 is a Code of Practice that provides guidelines for the control of noise in and around buildings. The BS recommend internal ambient noise criteria for a range of indoor spaces including residential land uses. The indoor ambient noise levels for unoccupied spaces relevant to this assessment are presented in Table 9.11.

Table 9.11: BS8233 Recommended Design Range Noise Levels

Activity	Location	Daytime LAeq,16hr (07:00 to 23:00)	Night-Time LAeq,8hr (23:00 to 07:00)
Resting	Living room	35dB	n/a
Dining	Dining room / area	40dB	n/a
Sleeping (daytime resting)	Bedroom	35dB	30dB

Unlike the previous version, BS 8233:2014 does not provide recommendations in relation to maximum noise levels in residential bedrooms at night from individual noise events such as vehicle or aircraft movements. Instead, it advises:

"Regular individual noise events…can cause sleep disturbance. A guideline value may be set in terms of SEL (Sound Exposure Level) or LAmax,F depending on the character and number of events per night. Sporadic noise events could require separate values."

With regards to external noise levels BS 8233 states:

"For traditional external areas that are used for amenity space, such as gardens or patios it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited".

World Health Organisation (WHO): Guidelines for Community Noise, 2000

The WHO document provides guidance of a similar nature to BS 8233:2014, although the emphasis is more on health impacts associated with noise. The document suggests internal and external guide levels. The daytime limits aim to prevent the majority of people being moderately or seriously annoyed by noise. The night-time limits are intended to ensure a good night's sleep.

BS 4142 – Methods for Rating and Assessing Industrial or Commercial Sound

The primary source of guidance in determining the significance of sound of an industrial and/or commercial nature on residential receptors, is provided in BS 4142:2014.

BS 4142 states that the potential impact from industrial/commercial sound is based on the level difference between the source, known as the 'specific sound' level (LAeq,Tr), compared with the 'background sound level (LA90,T) that exists in the absence of the source in question. Where the sound contains any acoustic characteristics such as tonality, impulsiveness and intermittency then the specific noise level is adjusted in-line with BS 4142 advice to determine the rating level (LAr,Tr).

Typically, the greater the difference between the rating level and the background sound level the greater the potential of an adverse impact. BS 4142 states:-

- A difference of + 10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of +5dB or more is likely to be an indication of an adverse impact, depending on the context.
- Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

BS4142 further states; 'Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.'

Context is an important consideration of a BS4142 assessment and the impact may require modification due to context, which may include:-

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound;
- Design measures that secure good internal and/or outdoor acoustic conditions, such as; façade insulation treatment, ventilation and/or cooling that will reduce the need to have windows open and acoustic screening.

British Standard 5228 - Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: 2009 and Part 2: 2009.

BS 5228:2009 provides guidance on the assessment of noise and vibration impacts during the development of a site, including procedures for estimating noise levels

from construction activities and vibration attributable to vibratory rolling and piling activities. The guidance does not define acceptable limits. However, it does provide potential methods for assessing the significance of noise and vibration impacts, which should be defined on a site-specific basis. BS 5228:2009 also provides guidance on minimising potential impacts through the use of mitigation and the adoption of Best Practicable Means (BPM). Full details of the BS 5228:2009 assessment criteria are presented as Appendix 9.3.

Calculation of Road Traffic Noise (CRTN)

Calculation of Road Traffic Noise (CRTN) (Department of Transport 1988) gives methods for the calculation of road traffic noise levels, taking into account factors such as distance between the road and receptor, road configuration, ground cover, screening, angle of view, reflection from façades and traffic flow, speed and composition. The noise parameter calculated is the LA10-18 hour and is based on the 18 hour Annual Average Weekday Traffic (18hr-AAWT).

All things being equal, a doubling of traffic flows will lead to a 3dB(A) change in the road traffic noise level and, therefore, a simple decibel comparison can be made by comparing the baseline traffic flows against the baseline plus the development traffic flows (using a logarithmic ratio).

9.05 **Baseline Conditions**

Existing Potentially Sensitive Receptors

The Site which is centred on grid reference 280472,857875 has noise sensitive receptors (NSRs) located to the south. The location of the NSRs are illustrated on Figure 9.1 and are presented in Table 9.12.

Figure 9.1 NSR Locations

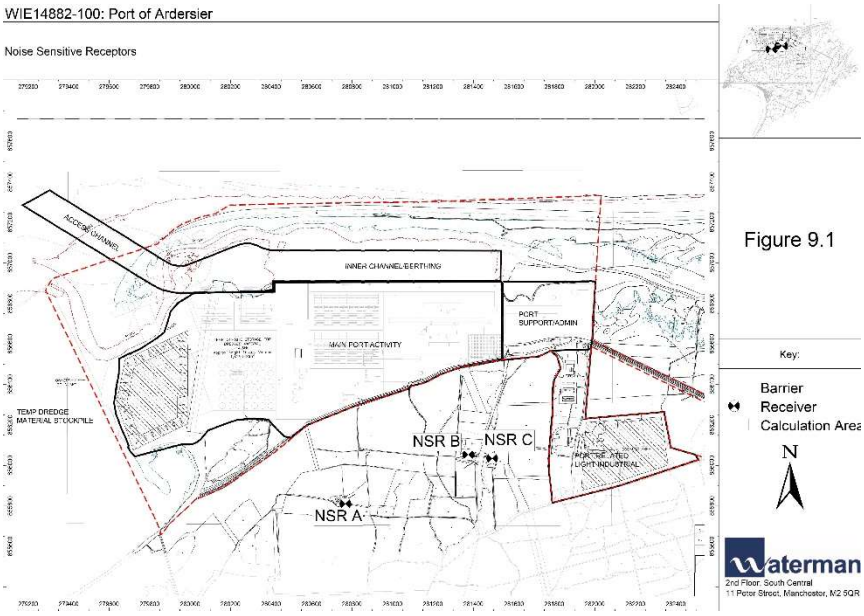


Table 9.12: Noise Sensitive Receptors

NSR (Figure 9.1)	NSR	Location	Description
A	Carse of Ardersier	280172,857207	Residential property, approximately 440 metres from the site boundary.
B	Carse of Ardersier	280821,857104	Residential property with farm outbuildings, approximately 440m from the site boundary.
C	Carse of Ardersier	280909,857019	Residential property, approximately 300m from the site boundary.

Baseline Noise Survey

Baseline noise surveys were undertaken from Wednesday 27th March 2013 to Monday 8th April 2013. The monitoring location was selected to represent the nearest noise sensitive receptors within the vicinity of the Proposed Development. The selected monitoring location is described in Table 9.13 and illustrated on Figure 9.1. The Highland Council's Environmental Health Department's Scoping Response confirmed that no updated baseline noise monitoring was required.

Table 9.13: Noise Monitoring Locations & NSRs

Noise Monitoring Location	Location	Description
LT1	Carse of Ardersier (NSR A) 280172,857207	Noise meter was located at a residential dwelling in the Carse of Ardersier. The dominant noise source at this location was distant road traffic noise.

Daytime noise measurements were conducted during the entire daytime (7:00-23:00) period. Night-time noise measurements were conducted during the entire night-time (23:00 and 7:00) period.

Unattended monitoring was undertaken for thirteen days to provide a large monitoring dataset. Noise measurements were undertaken consisting of 5-minute contiguous measurements. The noise indices measured were LAeq, LA90, LA10 and LAmax. An explanation of these is provided in Appendix 9.1.

Table 9.14 presents a summary of the baseline noise measurements. Full details are presented within Appendix 9.2. Given the large variation in background noise levels during the monitoring period, the lower 25th percentile of LA90, 5min values has been used to provide a representative measure of the prevailing background noise climate.

Table 9.14: Baseline Noise Survey Summary

Location (Figure 9.1)		Monitoring Period [1]	Noise Level dB $L_{Aeq,T}$	$L_{A90,\ ave}$	$L_{A90,\ 25pc}$ +	L_{A10}	L_{Amax} #	$L_{Amax,\ 90pc}$ *
LT1	Free-field ground floor long term unattended monitoring location 280175,857193	Day (0700–2300)	50.9	32.7	29.7	45.3	95.4	76.1
		Night (2300–0700)	46.9	29.7	27.5	37.5	86.8	69.6

Note: T is 16 hours for the daytime and 8 hours for the night-time
+ $L_{A90,\ 25pc}$ value is lower 25th percentile of measurements over survey period.
# Maximum monitored noise level during survey period
* L_{Amax} value is 90th percentile of measurements over survey period.

9.06 **Potential Effects**

Construction – Noise

Noise levels generated as a result of construction activities have been predicted. The calculations are provided in full as Appendix 9.3 and summarised in Table 9.15. It should be noted that the predicted impacts represent worst-case scenario when works are being undertaken at the shortest distance to the receptors (i.e. on the Site boundary).

Table 9.15: Predicted Noise Impacts Construction

NSR	Construction Phase / Predicted Noise Effects					
	Concreting	Haulage Lorry	Earth Moving	Road Pavement	Dredging	Piling
NSR A	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
NSR B	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
NSR C	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

With reference to Table 15 it can be seen that all phases would result in negligible effects due to the large separation distance between the construction activities and the nearest identified NSRs.

Construction - Vibration

As previously discussed it is not possible at this stage to quantitatively assess the effects from construction generated vibration on nearby existing sensitive receptors. However, it is generally accepted that for the majority of people, vibration levels of approximately 0.14mm/s peak particle velocity (ppv) are just perceptible. When considering the potential for building damage to arise a limit of 10 mm/s is commonly adopted in line with the guidance provided within BS 5228:2009.

With reference to Table 9.12 it can be seen that all sensitive receptors are in excess of 20m from where works are to be undertaken. As such, it is unlikely that perceptible levels of vibration would arise at nearby NSRs (see **Error! Reference source not found.**12). As such, negligible effects upon occupants of nearby NSRs are predicted.

Construction Traffic

In addition to construction plant operating on the Site, there would be some movement of materials to and from the Site by road. Condition 9 of the existing planning permission in principle (application reference 13/01689/PIP) requires the submission of a Traffic Management Plan in relation to both construction and operation. It is anticipated that a similar conditional requirement will be attached to the renewal of the existing consent, should planning permission in principle be granted. Given the large separation distances from access roads to the site and the nearest residential receptors, it is considered that any effects from local construction traffic would be negligible.

Completed Development - Operational Noise

As the planning application is to renew the existing planning permission in principle, current information on the operation of the development is limited and as such some assumptions have been made to the operation of the site in terms of noisy activities.

Consequently, calculations have been undertaken based on generic sound level data presented in BS 5228-1:2009 'Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise', data from the IMAGINE project database and historical field measurements undertaken by Waterman Infrastructure & Environment Ltd. The source noise levels used for assessment purposes have been selected to represent typical operations within the site.

Table 9.16: Noise Sources included in Assessment

Source ID	Source Type	Number of Units / movements in assessment period (1 hour)	Description	Sound Power Level (dB(A)) per unit length / area
Concrete batching	Point	1	Measured at concrete manufacturing facility	99
Stacking crane (heavy lifting gantry)	Point	1	Measured at shipping container terminals	102

Source ID	Source Type	Number of Units / movements in assessment period (1 hour)	Description	Sound Power Level (dB(A)) per unit length / area
Heavy Barge crane (slipway)	Point	1	Measured at shipping container terminals	102
Cable spooling	Point	3	Conveyor system motor	99
Pumping station	Point	1	Pump unit	93
Concrete pump	Point	1	120 mm diameter / 50 bar (BS5228)	103
Barge crane	Point	2	Measured at shipping container terminals	97
Readymix conveyor motor	Point	1	Measured at cemex plant	88.4
Readymix lorries	Line	10 movements	Along southern access road between site entrance and concrete batching area	70.9
Heavy forklift	Line	10 movements	Between pre-assembly area, tower blade / nacelle area and production area	84
Heavy forklift	Line	10 movements	From heavy lifting gantry through laydown area	84
Heavy forklift	Line	10 movements	Between unit storage area and production area	84
Forklift	Line	10 movements	Movement around cable spooling area	75
Loading Area	Area	1	Area source measurements from transhipment of containers	66.8
Workshop roof	Area	1	From internal noise level of 85dB, assuming trapezoidal steel sheet roof	61
Workshop	Area	4	Walls of workshop – 85dB internal noise level, trapezoidal steel sheet walls	61
Car park	Area	1	Calculations based on 925 spaces, typical shopping centre diurnal profile	105.1 (total sound power)

The noise sources in Table 9.16 have been input to a noise prediction model created in CADNA-A. CADNA-A is a computer programme used for the assessment of noise exposure. The model calculates industrial noise propagation according to the guidance provided in ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors. Part 2 – General Method of Calculation'. The model takes into account local topography, ground absorption and screening in undertaking the calculations.

Noise levels were calculated at the closest NSRs to the Proposed Development for a worst case scenario over a one hour period. In practice, noise levels would tend to be lower due to plant moving close to and further away from the receptors and the screening effects of buildings. Noise levels would also tend to reduce over a working day due to periods of plant inactivity.

Noise levels have been calculated based upon the indicative layout included within Technical Appendix 3.2 and assessed against the guidance presented within BS 4142:2014 and the PAN 1 Technical Advice Note. The assessment results are presented in Table 9.16. Noise contour plots showing noise propagation from the works are presented as Figure 9.2. Given the potential intermittent and tonal nature of the noise sources, a +6dB acoustic character has been applied to all predicted noise levels in line with the guidance provided in BS 4142:2014.

It is understood that the Site is to operate twenty-four hours a day, seven days a week. It is important to note here that due to the lack of detailed information on day and night-time operations at this stage, the assumed noise sources detailed in Table 9.16 have been used for both daytime and night-time assessment. However in reality, once the Proposed Development is completed, it is expected that operations on site would run at a reduced level during night-time hours. This however cannot be quantified at this stage so a worst case assessment has been undertaken.

Figure 9.2 Operational Noise Levels

Table 9.17: Assessment of Receptor Sensitivity

	NSR A		NSR B		NSR C	
	Day	Night	Day	Night	Day	Night
Specific Noise Level (Calculated from CADNA-A model)	34.7	34.7	33.6	33.6	32.4	32.4
Acoustic Character Correction	5	5	5	5	5	5
Rating Noise Level	40.7	40.7	39.6	39.6	38.4	38.4
Background noise level (L_{A90})	29.7	27.5	29.7	27.5	29.7	27.5
Difference	11	13.2	9.9	12.1	8.7	10.9
Sensitivity of Receptor	High	High	Medium	High	Medium	High

The assessment presented in Table 9.17 indicates that NSRs should be assigned a medium to high sensitivity rating dependent on the location and time of day. This then allows a quantitative assessment to be carried out based on the estimated change in noise level, LAeq,T before and after the Proposed Development is operational.

Given the large amount of private amenity space around residential dwellings in the area, and the low ambient noise levels, the noise change assessment will be carried out externally. The ambient daytime noise levels from the baseline noise survey as summarised in Table 9.14 are a good measure of the prevailing noise climate that could potentially be affected by operational noise from the Proposed Development.

Table 9.18: Assessment of Noise Impact Magnitude

	NSR A		NSR B		NSR C	
	Day	Night	Day	Night	Day	Night
RatingNoise Level (Calculated from CADNA-A model)	40.7	40.7	39.6	39.6	38.4	38.4
Prevailing ambient noise level (reference **Error! Reference source not found.**)	50.9	46.9	50.9	46.9	50.9	46.9
Predicted + Ambient Noise level	51.3	47.8	51.2	47.6	51.1	47.5
Predicted change in noise level	0.4	0.9	0.3	0.7	0.2	0.6
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

The assessment of the magnitude of noise impacts detailed in Table 9.18 indicates that a negligible magnitude of impacts would be expected from site operations. Additionally, given the small predicted increases in noise level, the large separation distances and visual barriers provided by dense woodland between NSRs and the development, the magnitude of impact is considered adequate for the assessed scenario.

At this stage in the design process, it is considered that the location and specification of any fixed or mobile plant is sufficiently flexible to ensure that suitably quiet non-tonal plant can be procured, and/or mitigation options such as location and screening can be investigated as necessary to ensure disturbance to neighbouring sensitive uses is minimised.

In the absence of the above mitigation measures, referencing the significance of effects from Table 9.18, medium receptor sensitivity and negligible impact magnitudes would result in a Neutral / Slight significance of effects on all receptors and are not deemed to be of significance in the decision making process for the Proposed Development.

Notwithstanding the above, it is preferential that where practicable the development aims to achieve neutral significance of effects, for which some mitigation measures may be necessary.

Completed Development - Traffic Noise

As described previously, the initial process for the traffic noise assessment would be to assign a level of sensitivity to NSRs. The level of sensitivity for all assessed NSRs, based on the monitored noise levels in Table 9.14 would be Medium.

The 18-hour annual average weekday traffic flows (AAWT) included within the 2013 Transport Assessment (prepared by SKM Colin Buchanan) on approach roads for the site have been used to establish noise changes as a consequence of the Proposed Development. Traffic data has been provided for a baseline situation and a baseline situation plus the Proposed Development for the opening year (2016). This enables the noise impact as a direct consequence of the Proposed Development to be calculated.

BNL noise levels have been calculated for the road links covered by the traffic impact assessment. The calculations have utilised the 18-hour AAWT and heavy goods vehicle (HGV) compositions provided by the traffic engineers. The calculated BNL's and noise changes for each road link are presented in Technical Appendix 9.4 and summarised in Table 9..19.

Table 9.19: Assessment of Noise Impact Magnitude (Traffic Noise)

Road		Base Year	Base Year + Dvmt	Change in Noise Level	Magnitude of Impact
1	A96 (between Leopald Street and St Ninian Road)	69.5	70.1	0.7	Negligible
2	A96 (between B9092 and Leopold Street)	68.7	69.5	0.8	Negligible
3	A96 (between Site Access road and B9092)	68.8	69.0	0.2	Negligible
4	A96 (between B9006 and Site Access)	68.7	69.9	1.2	Minor
5	A96 (between Inverness Airport roundabout and B9006)	69.0	70.2	1.2	Minor
6	A96 (between Eastfield Way and Barn Church Road)	71.8	72.3	0.5	Negligible
7	A96 (between A9 and Eastfield Way)	72.2	72.6	0.4	Negligible
8	B865 Milburn Road (between Old Perth Road and A9)	69.5	70.0	0.5	Negligible

Calculations of road traffic noise levels in terms of the BNL, indicate that increases in road traffic noise levels on the principal roads surrounding the Proposed Development would be less than 3dB(A) on completion and occupation. This is expected to be an imperceptible change in noise levels over a period of time. However, an increase in noise levels of this of 1.2dB has the potential to give rise to a minor magnitude of noise impact on sensitive receptors within 10m of the carriageway edge.

Referencing the significance of effects, medium receptor sensitivity and moderate impact magnitudes would result in a neutral / slight significance of effects on receptors 10m from the carriageway and are not deemed to be of significance in the decision making process for the Proposed Development.

Additionally, the ambient noise levels at receptors 10m from the A96 carriageway would be elevated due to proximity to passing traffic. It is likely that the sensitivity of these receptors would be reduced to 'Low' with expected noise levels of over 55dB LAeq,16hr. It is therefore considered that combined with moderate impact magnitudes, a neutral significance of effects would be predicted. Hence road traffic noise need not be considered as a determining factor in the decision making process.

9.07 **Cumulative Assessment**

Given that there are no cumulative sites within 1km of the development, it is considered that any cumulative effects on construction or operational noise would be negligible and the conclusions of this chapter would remain.

9.08 **Mitigation**

Construction Phase

Introduction of measures to control noise and vibration during the construction phases of a Proposed Development is recommended, even where negligible impacts are predicted. Disturbance from construction activities can normally be defined as a temporary nuisance to people in the area that can occur at any time between the start of construction works and the opening of the development.

A Construction Environmental Management Document (CEMD) has been prepared for the Site to mitigate and monitor environmental impacts, including noise and vibration, during the construction phase. This is included in Technical Appendix 3.3. This includes a Noise and Vibration Plan.

In accordance with standard working practices the principles of 'best practicable means' (BPM) as defined in the CoPA 1974, would be used to reduce emissions throughout the construction period. This would incorporate the use of measures to control noise and vibration that do not unreasonably inhibit the work and the use of working methods that result in minimum impacts compatible with best working practices.

Noise control measures, such as the siting of fixed plant away from NSRs, the use of properly silenced plant, and screening / enclosures where appropriate, should ensure that any imposed daytime construction noise limit is not exceeded at existing NSRs.

In practice, the degree of noise attenuation from screening and other measures, such as separation distance and operational times, would likely be greater than 10dB, which would reduce the construction noise levels shown in Technical Appendix 9.3 for all phases to below the individual threshold levels for each NSR. Further analysis of the potential noise and vibration impacts on local receptors would be carried out during the Proposed Development's detailed design once more accurate information on construction methods and plant is available, so that appropriate controls can be agreed with Highland Council's Environmental Health Department and implemented in advance of the works.

Appropriate conditions to minimise noise and vibration would be imposed on the Contractor as part of their contract requirements. Control measures are incorporated into the CEMD and include the following:

- Selecting inherently quiet plant;
- Using, where necessary and practicable, enclosures and screens around any noisy fixed plant;
- Limiting site work hours, where possible; and
- Adhering to relevant British Standards.

The CEMD also includes:

- Requirements for monitoring and record-keeping;
- Mechanisms for third parties to register complaints and the procedures for responding to complaints;
- Provisions for reporting, public liaison and prior notification, especially where dispensations would be required;
- Requirements for monitoring of noise and / or vibration as well as audit procedures.

Provision would also be made for specific noise and vibration criteria to be adhered to, where feasible, and for suitable plant and working methods to be agreed with The Highland Council prior to commencement of works. Where required, on-site monitoring of noise and / or vibration would also be carried out, which would assist in controlling levels at specific NSRs.

'Prior Consent' procedures with The Highland Council (under Section 61 of CoPA 1974) may also be implemented. This would provide The Highland Council with the necessary details relating to construction method statements and construction noise and / or vibration impacts, thereby enabling The Highland Council to check that BPM are being used and that the noise and vibration controls are implemented. In authorising an application for Prior Consent, The Highland Council can apply reasonable conditions where these are considered necessary.

In addition, a Construction Traffic Management Plan is recommended to minimise the potential impacts from construction traffic. Key controls would include:

- Provision to ensure that the unloading is carried out on-site rather than on the adjacent roads;
- Routing of construction vehicles via designated routes, which would be agreed with The Highland Council and other relevant authorities; and
- Phasing of materials deliveries which would be controlled on a 'just-in-time' basis, wherever possible, minimising travel time and traffic congestion around the Site.

The above controls are regularly and successfully applied to large scale construction projects in order to minimise noise and vibration impacts on local communities. The application of similar control measures during the construction of the Proposed Development would likewise ensure that the works proceed with the minimum disturbance to businesses, pedestrians and local residents.

<u>Completed Development - Operational Noise</u>

Given that some adverse effects have been predicted from the preliminary assessment of operational noise from the Proposed Development, outline mitigation measures are proposed below.

Building Services and Fixed Plant

Mitigation for building services and fixed plant include the following measures, which are not exhaustive:

- Procurement of 'quiet' non-tonal plant;
- Locate plant and air vents away from NSRs;
- Acoustic enclosures;
- In-duct attenuators;
- Acoustic louvres;
- Using, where necessary and practicable, enclosures and screens around any noisy fixed plant;
- Plant will be located, as far as is reasonably practicable, away from adjacent occupied buildings or as close as possible to noise barriers or site hoardings where these are located between the plant and the buildings; and
- Isolation of plant from building structure.

On-site Vehicle Movements

As minimal information is available at this stage on vehicle movements within the Proposed Development, some generic advice can be provided to ensure that noise levels do not adversely affect NSRs.

- Only vehicles conforming to relevant national or international standards, directives and recommendations on noise and vibration emissions will be used;
- Site hoarding and screens will provide acoustic screening where necessary where vehicle movements are in close proximity to NSRs;
- Personnel will be instructed on BPM to reduce noise and vibration as part of their induction including training as required prior to specific work activities;
- When transporter engines are not required to be running, i.e. other than unloading, engines should be turned off so they do not contribute unnecessarily to the prevailing noise climate; and
- Where possible, vehicles should be fitted with broadband reversing alarms rather than tonal types.

Condition 19 attached to the existing in principle consent requires that *'all plant, machinery and equipment associated with ventilation, air-conditioning, heating and refrigeration or similar mechanical services within the application site, including fans, ducting and external openings shall be installed, maintained and operated such that any operating noise complies with Noise Rating Curve 20 and details of a noise assessment for each installation shall be submitted alongside the relevant application for the AMSIC…'*. It is assumed that a similar conditional requirement will remain attached to any planning permission granted to renew this application.

Traffic Noise

As a neutral significance of effects have been predicted due to any potential increases in traffic from the operation of the development, no mitigation measures are required.

9.09 **Statement of Significance**

Construction Phase

If appropriate measures to mitigate and control noise from construction works are available and are implemented in accordance with relevant planning conditions, minimum disturbance to local residents is envisaged. Nevertheless, some short-term disturbance to sensitive receptors immediately adjacent to the Site is likely when works occur on or near the site boundary, resulting in temporary moderate adverse residual impacts.

In accordance with condition 9 attached to the existing in principle consent, a Traffic Management Plan would be agreed with The Highland Council to minimise the temporary and intermittent impacts that construction traffic can cause. It is therefore considered that there would likely be a negligible residual impact on nearby existing NSRs as a result of construction traffic noise and vibration.

Appropriate measures to mitigate and control noise from construction works are available and would be implemented in accordance with existing planning conditions. As a consequence, it is envisaged that the construction works would proceed with the minimum disturbance to local residents and businesses.

With regards to the potential effects of construction-generated vibration on nearby existing and proposed potentially sensitive receptors, vibration limits would be set to ensure compliance with national standards and hence, minimise the risk of complaints or building damage. These limits would be controlled through the implementation of a CEMD and following Highland Council's Code of Construction Practice (CoCP). Following the implementation of appropriate mitigation measures construction generated vibration would have a negligible effect on existing NSRs.

Completed Development - Operational Noise

By implementing the appropriate level of mitigation recommended previously, residual effects would remain neutral.

Completed Development - Traffic Noise

Given that a neutral significance of effects was predicted, it is considered that no mitigation would be required. As such the residual effects associated with operational road traffic noise would remain neutral.

References

British Standards Institution (2009) British Standard 5228: Code of practice for noise and vibration control on construction and open sites.

British Standards Institution (2014) British Standard 4142: Methods for rating and assessing industrial and commercial sound'

Department of Transport (1988) Calculation of Road Traffic Noise. HMSO

Scottish Government (2011) Technical Advice Note: Assessment of Noise

Scottish Government (2011) Planning Advice Note 1: Planning and Noise

DGMR Industry (2007) Improved Methods for the Assessment of the Generic Impact of Noise in the Environment

ISO 9613-2 'Acoustics – Attenuation of sound propagation outdoors. Part 2 – General Method of Calculation

ISO 9612-2 'Acoustics – attenuation of sound propagation outdoors. Part 2 General Method of Calculation

Port of Ardersier Ltd (2013) Port of Ardersier Transport Assessment

10.00 Underwater Noise

10.01 **Introduction**

Subacoustech Environmental has been appointed by Ardersier Port Ltd (the Applicant) to prepare an update to the underwater noise assessment prepared in 2013.

This Chapter considers underwater noise effects that may arise during the construction and operation of the Proposed Development. This Chapter should be read in conjunction with Chapter 8 Marine Ecology.

10.02 **Scoping and Consultation**

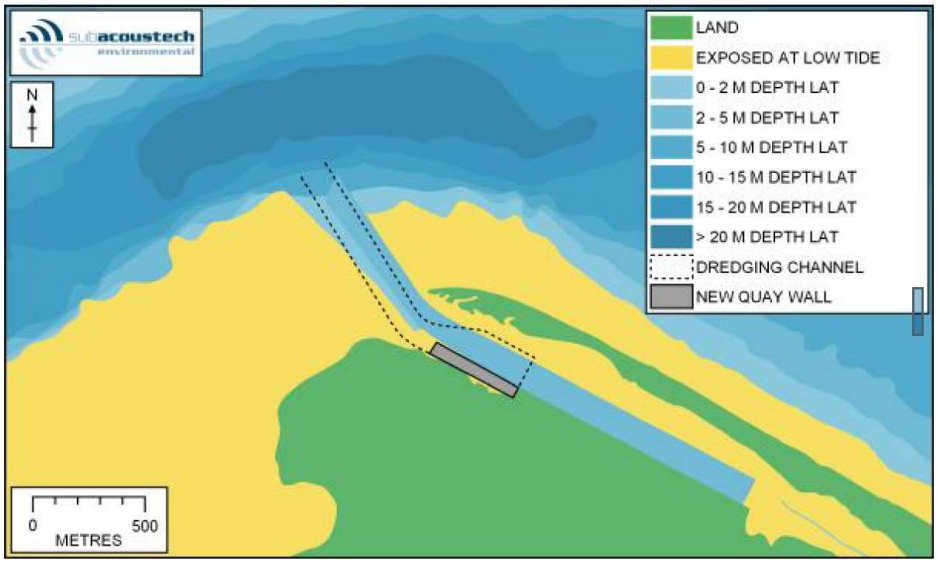
In 2013 Subacoustech Environmental undertook a study to model the likely subsea noise levels during the construction of the Proposed Development. The study covered noise from the dredging of a new channel leading into the port using a cutter-suction dredger and vibropiling to install the new quay wall.

Marine Scotland's Scoping Response (Technical Appendix 2.4) requested that an updated underwater noise assessment was undertaken. Since the study was completed in 2013, new criteria has been introduced to assess anthropogenic underwater noise and its effect of marine species. Specifically, the weightings applied to the different species groups and the thresholds at which the onset of an effect is predicted have been changed. The Chapter assesses the effects of the Proposed Development on underwater noise levels, in accordance with this new criteria.

10.03 **Potential Effects**

As detailed in Chapter 3, the Proposed Development will involve dredging of the channel leading into the port and vibropiling to install the new quay wall. The location of the proposed dredging and piling activities at Port of Ardersier is illustrated in Figure 10.1 below.

Figure 10.1: Sketch map of the Port of Ardersier site showing the location of dredging and vibropiling activities

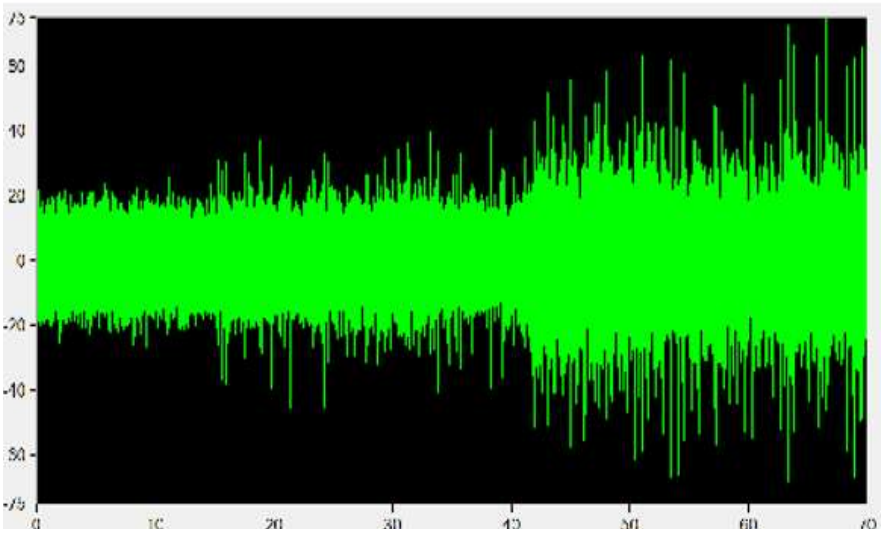


This Chapter presents the modelling results using assessment criteria for marine mammals from National Marine Fisheries Service (NMFS) (2018) and for fish from Popper *et al*. (2014). The two identified noise sources resulting from the Proposed Development are dredging and vibropiling. The noise level from these has been assessed using the Simple Propagation Estimator and Ranking (SPEAR) model.

Summary of Dredging Noise

Cutter suction dredging has been proposed to clear a 120m wide, 6.5m deep channel into the new facility. This process involves a rotating cutter head that loosens rocks and seabed, then a suction inlet that sucks up the loosened material up onto the vessel. A typical time history of dredging noise is shown in Figure 10.2, which indicates a fairly constant level of underwater pressure levels with very few transient increases or decreases for the first 40 seconds of the recording. After this point noise levels increase. It is thought that at this point the dredger may have reached a region of gravel or rocky material as noise similar to large aggregate rattling up the suction pipe is audible on the recording. This produces the numerous high level transient peaks in underwater pressure visible in Figure 10.2 between about 40 seconds and the end of the capture. It can be seen that there can be considerable variation in the noise levels and frequency components of noise from the suction dredger, which may be due to variations in engine speed as the vessel maintains its course, or in the suction force applied or there is change in the material being dredged.

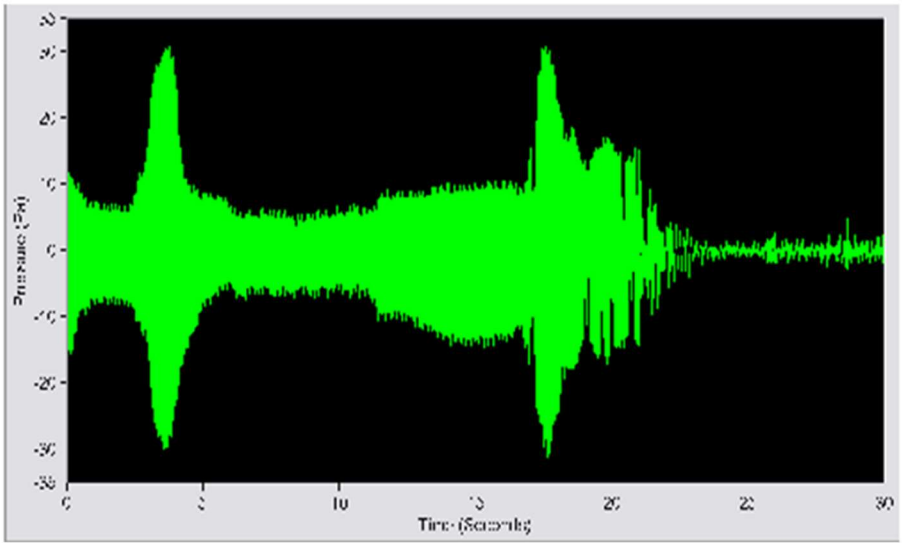
Figure 10.2: Pressure time history from suction dredging activity



Summary of Vibropiling Noise

Vibropiling is to be used as part of the construction process of a new quay wall at the port. The process of vibropiling involves installing tubular or sheet piles into the ground with a vibrating hammer rather than the high impact strike from the pile driving hammer used for impact piling. Vibropiling operations tend to generate underwater noise at a large range of levels unlike, for example, impact piling, where each strike is more or less the same level unless conditions change. To illustrate this, a typical recording of vibropiling noise is shown in Figure 10.3, it can be seen that the levels of noise increase considerably about 3 seconds into the recording before reducing down to a more constant level, increasing again for a short period of time before reducing down to background noise levels at which point the piling stopped. This variation has been incorporated into the modelling undertaken in this study to give a more realistic idea of the most likely noise levels from vibropiling.

Figure 10.3: A Typical Time History from Vibropiling



Measurement of Underwater Noise

This assessment considers criteria defined by NMFS (2018) to assess the effects of impulsive noise on marine mammals. The NMFS (2018) guidance puts marine mammal species into hearing groups and applies filters to the noise to approximate the hearing sensitivity of the receptor.

The hearing groups given in the NMFS (2018) guidance are summarised in Table 10.1. A further hearing group for Otariid Pinnipeds is also given for sea lions and fur seals, but this has not been used in this study as those species are not commonly found in the waters surrounding Great Britain.

Table 10.1: Marine mammal hearing groups (from NMFS, 2018)

Hearing Group	Example Species	Generalised Hearing Range
Low Frequency (LF) cetaceans	Baleen Whales	7 Hz to 35 kHz
Mid Frequency (MF) cetaceans	Dolphins, toothed whales, beaked whales, bottlenose whales (including bottlenose dolphin)	150 Hz to 160 kHz
High Frequency (HF) cetaceans	True porpoises (including harbour porpoise)	275 Hz to 160 kHz
Phocid Pinnipeds (PW) (underwater)	True Seals (including harbour seal)	50 Hz to 86 kHz

For non-impulsive noise like vibropiling and dredging, NMFS (2018) presents cumulative (i.e. noise received over a long period) weighted sound exposure criteria (SEL_{cum}) for both permanent threshold shift (PTS), where unrecoverable hearing damage may occur, and temporary threshold shift (TTS), where a temporary reduction in hearing sensitivity may occur in individual receptors.

Table 10.2 presents the NMFS (2018) criteria used in this study for each of the key marine mammal hearing groups.

Table 10.2: Assessment criteria for marine mammals from NMFS (2018) for non-impulsive noise

Non-impulsive noise Hearing group	PTS criteria SEL_{cum} (weighted) dB re 1 μPa^2s	TTS criteria SEL_{cum} (weighted) dB re 1 μPa^2s
LF Cetaceans	199	179
MF Cetaceans	198	178
HF Cetaceans	173	153
PW Pinnipeds	201	181

The Popper *et al*. (2014) criteria gives specific criteria for various stimuli, for which vibropiling and dredging fall into the 'Shipping and Other Continuous Noises' category. Species of fish are grouped by whether they have a swim bladder and whether that swim bladder is involved in its hearing. Unlike the marine mammal criteria defined in NMFS (2018), all values for fish have no frequency weighting for hearing sensitivity.

Where insufficient data is available (which is the case for most effects from continuous noise sources), qualitative criteria have been given, summarising the effect of the noise as having either a high, moderate of low effect on an individual in

either the near-field (tens of metres), intermediate-field (hundreds of metres), or far-field (thousands of metres). All the criteria are given in Table 10.3.

Table 10.3: Assessment criteria for species of fish from Popper *et al*. (2014) for shipping and other continuous noises

Type of animal	Mortality & potential mortal injury	Impairment			Behaviour
		Recoverable injury	TTS	Masking	
Fish: no swim bladder	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: swim bladder not involved in hearing	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: swim bladder involved in hearing	(N) Low (I) Low (F) Low	170 dB RMS for 48 hours	158 dB RMS for 12 hours	(N) High (I) High (F) High	(N) High (I) Moderate (F) Low
Eggs and larvae	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low	(N) Moderate (I) Moderate (F) Low

(for qualitative effects, N = Near-field, I = Intermediate-field, and F=Far-field)

The qualitative descriptions need not be considered further, but results are provided for the recoverable injury and TTS values for the most sensitive "fish with a swim bladder involved in hearing" category.

10.04 **Baseline Conditions**

The SPEAR model is based on Subacoustech Environmental substantial database of noise measurements from various noise sources and subsea activities. It can be used to predict typical levels of underwater noise generated by various activities.

Baseline Conditions

The source levels used for the modelling are summarised in terms of unweighted values and NMFS (2018) weighted values in Table 10.4 below.

Table 10.4: Summary of the source levels used for modelling

	Dredging	Vibropiling
Unweighted RMS (1s SEL)	186.0 dB re 1 µPa @ 1 m	193.0 dB re 1 µPa @ 1 m
Low Frequency (LF) Cetaceans	183.5 dB re 1 μPa^2s @ 1 m	190.6 dB re 1 μPa^2s @ 1 m
Mid Frequency (MF) Cetaceans	178.1 dB re 1 μPa^2s @ 1 m	177.0 dB re 1 μPa^2s @ 1 m
High Frequency (HF) Cetaceans	176.4 dB re 1 μPa^2s @ 1 m	172.2 dB re 1 μPa^2s @ 1 m
Phocid Pinnipeds (PW)	181.8 dB re 1 μPa^2s @ 1 m	188.6 dB re 1 μPa^2s @ 1 m

The NMFS (2018) criteria are based on cumulative received Sound Exposure Levels (SELs) and as such an estimate must be made as to how long each noise source will be present in any 24-hour period. To cover all eventualities, 3 scenarios have been used for this assessment:

- A most-likely -case of 8 hours;
- A worst-case of 12 hours; and
- A maximum-case of 24 hours.

Most of these time periods are highly unlikely but have been included to show the most precautionary estimates for impact ranges.

Where the Popper *et al*. (2014) guidance gives specific criteria for continuous noise (Table 10.3), the criteria are stated as an SPL_{RMS}, and cumulative noise exposure calculations, as per SEL_{cum} for the NMFS (2018) criteria, are not required for comparative purposes.

The SEL_{cum} results have been calculated for both a fleeing animal, where the receptor swims away from the noise source, and a worst-case stationary animal model, where the receptor remains still throughout the noise activity, have been used. The fleeing animal model assumes the receptor flees at a constant speed away from the noise source, for this, a constant speed of 3.25 ms^{-1} has been assumed for the low frequency (LF) cetaceans group based on data for minke whale (Blix and Folkow, 1995), all other receptors, are assumed to swim at a constant speed of 1.5 ms^{-1} (Otani *et al*. 2000). These are considered worst-case speeds (i.e. relatively slow, leading to greater exposures) as most species are expected to be able to swim much faster under stress conditions. This method has been taken in order to provide as realistic assessment as possible given a lack of sound sensitivity data available for this species group.

The cumulative SEL range modelled is the distance that a receptor must be at the start of the vibropiling or dredging noise, at which point the receptor flees, progressively gaining exposure (in the case of the fleeing animal model, for the stationary animal model it is assumed that the receptor stays at the same range of the noise for the entire duration). Where a receptor is inside this range at the start of the noisy activity, the defined threshold will be exceeded.

The stationary animal model can be considered unrealistic, as no receptor would remain still for hours, but is included as a precautionary theoretical worst-case scenario.

10.05 **Potential Effects**

The results from the modelling are summarised in Table 10.5 to Table 10.12 below, with impact ranges for dredging in Table 10.5 to Table 10.8 and vibropiling in Table 10.9 to Table 10.12.

Dredging

Tables 10.5, 10.6 and 10.7 below summarise the impact ranges for auditory injury (PTS and TTS) using criteria from NMFS (2018) for dredging (non-impulsive) noise over 8, 12 and 24 hours, respectively.

Table 10.8 shows a summary of the impact ranges for fish using criteria from Popper *et al*. (2014) for dredging (continuous) noise.

Table 10.5: Summary of the impact ranges for auditory injury using criteria from NMFS (2018) for dredging (non-impulsive) noise over 8 hours

Dredging	PTS criteria		TTS criteria	
NMFS (2018) - SEL_{cum} (8 hours)	Fleeing	Stationary	Fleeing	Stationary
Low Frequency (LF) Cetaceans	< 1 m	34 m	2 m	370 m
Mid Frequency (MF) Cetaceans	< 1 m	20 m	2 m	220 m
High Frequency (HF) Cetaceans	3 m	330 m	230 m	2.8 km
Phocid Pinnipeds (PW)	< 1 m	22 m	2 m	240 m

Table 10.6: Summary of the impact ranges for auditory injury using criteria from NMFS (2018) for dredging (non-impulsive) noise over 12 hours

Dredging	PTS criteria		TTS criteria	
NMFS (2018) - SEL_{cum} (12 hours)	Fleeing	Stationary	Fleeing	Stationary
Low Frequency (LF) Cetaceans	< 1 m	42 m	2 m	460 m
Mid Frequency (MF) Cetaceans	< 1 m	25 m	2 m	280 m
High Frequency (HF) Cetaceans	3 m	400 m	230 m	3.3 km
Phocid Pinnipeds (PW)	< 1 m	27 m	2 m	300 m

Table 10.7: Summary of the impact ranges for auditory injury using criteria from NMFS (2018) for dredging (non-impulsive) noise over 24 hours

Dredging	PTS criteria		TTS criteria	
NMFS (2018) - SEL_{cum} (24 hours)	Fleeing	Stationary	Fleeing	Stationary
Low Frequency (LF) Cetaceans	< 1 m	61 m	2 m	640 m
Mid Frequency (MF) Cetaceans	< 1 m	36 m	2 m	390 m
High Frequency (HF) Cetaceans	3 m	570 m	230 m	4.3 m
Phocid Pinnipeds (PW)	< 1 m	39 m	2 m	420 m

Table 10.8: Summary of the impact ranges for fish using criteria from Popper et al. (2014) for dredging (continuous) noise.

Dredging Popper *et al.* (2014) - RMS	Recoverable injury	TTS
Fish: swim bladder involved in hearing	7 m (48 hours)	30 m (12 hours)

Note: Fish must remain within this range for the time in parentheses to reach threshold.

Vibropiling

Tables 10.9, 10.10 and 10.11 below summarise the impact ranges for auditory injury (PTS and TTS) using criteria from NMFS (2018) for vibropiling (non-impulsive) noise over 8, 12 and 24 hours, respectively.

Table 10.12 shows the impact ranges for fish using criteria from Popper *et al*. (2014) for vibropiling (continuous) noise.

Table 10.9: Summary of the impact ranges for auditory injury using criteria from NMFS (2018) for vibropiling (non-impulsive) noise over 8 hours

Vibropiling	PTS criteria		TTS criteria	
NMFS (2018) - SEL_{cum} (8 hours)	Fleeing	Stationary	Fleeing	Stationary
Low Frequency (LF) Cetaceans	< 1 m	110 m	9 m	1.4 km
Mid Frequency (MF) Cetaceans	< 1 m	21 m	< 1 m	270 m
High Frequency (HF) Cetaceans	2 m	280 m	200 m	3.6 km
Phocid Pinnipeds (PW)	< 1 m	62 m	8 m	800 m

Table 10.10: Summary of the impact ranges for auditory injury using criteria from NMFS (2018) for vibropiling (non-impulsive) noise over 12 hours

Vibropiling	PTS criteria		TTS criteria	
NMFS (2018) - SEL_{cum} (12 hours)	Fleeing	Stationary	Fleeing	Stationary
Low Frequency (LF) Cetaceans	< 1 m	130 m	9 m	1.7 km
Mid Frequency (MF) Cetaceans	< 1 m	26 m	< 1 m	340 m
High Frequency (HF) Cetaceans	2 m	340 m	200 m	4.4 km
Phocid Pinnipeds (PW)	< 1 m	77 m	8 m	1.0 km

Table 10.11: Summary of the impact ranges for auditory injury using criteria from NMFS (2018) for vibropiling (non-impulsive) noise over 24 hours

Vibropiling	PTS criteria		TTS criteria	
NMFS (2018) - SEL_{cum} (24 hours)	Fleeing	Stationary	Fleeing	Stationary
Low Frequency (LF) Cetaceans	< 1 m	190 m	9 m	2.5 km
Mid Frequency (MF) Cetaceans	< 1 m	38 m	< 1 m	490 m
High Frequency (HF) Cetaceans	2 m	500 m	210 m	6.5 km
Phocid Pinnipeds (PW)	< 1 m	120 m	8 m	1.5 km

Table 10.12: Summary of the impact ranges for fish using criteria from Popper *et al*. (2014) for vibropiling (continuous) noise.

Vibropiling Popper *et al*. (2014) - RMS	Recoverable injury	TTS
Fish: swim bladder involved in hearing	19 m (48 hours)	88 m (12 hours)

Note: Fish must remain within this range for the time in parentheses to reach threshold.

Comparing like-for-like, vibropiling noise results in larger impact ranges than dredging, with the largest ranges expected for high frequency cetaceans. The ranges are exacerbated when considering long time periods or the case of a stationary animal.

It is also worth noting that the fleeing animal ranges barely change when comparing the different possible time periods. This is because after a certain point the receptor is at such a long range that the additional noise from the source has either fallen below background or is sufficiently low as to not further add to the received noise.

Effect of Underwater Noise on Cetaceans

The way in which noise affects marine mammals is dependent on several factors, including the type of noise generated, the noise level, the species of marine mammal and the distance between the animal and the source of the noise. The National Oceanic and Atmospheric Administration (NOAA) describes how different groups of marine mammals hear and are affected by sounds, which can be found in the *'Guidance for Assesing the Effects of Anthropogenic Sound on Marine Mammal Hearing*'. The effects can be described as either a Permanent Threshold Shift (PTS), where an animal experiences irreversible damage to their hearing which can in turn affect their ability to forage and reproduce and in extreme circumstances result in death; or a Temporary Threshold Shift (TTS) which an animal can recover from, but may experience 'masking' which reduces its ability to communicate with other animals and locate prey, resulting in fatigue.

10.06 **Cumulative Assessment**

Given the location of the relevant cumulative projects from the Proposed Development, it is not anticipated that the Proposed Development will result in any cumulative effects in relation to underwater noise.

10.07 **Mitigation**

The underwater noise model was run using three assumptions; vibropiling/dredging continuously for eight hours, 12 hours and a worst case scenario of 24 hours. The results are used to determine an appropriate mitigation zone in order to provide effective mitigation for marine mammals during underwater noise producing activities, i.e. the distance that is required between the noise source and the animal to prevent the risk of PTS. Although piling works are anticipated to be 09.00-17.00, the 12 hour assumption was used to determine the impacts, to account for any overrunning works and to reflect a worst-case scenario. The 24 hour scenario was used to determine the impacts from dredging.

Although bottlenose dolphin are a feature of the SAC, are present within the area year-round and are the species most likely to be encountered during works; they are not at high risk of PTS or TTS, with the maximum TTS range (when fleeing) of 2m from the source of the noise.

Harbour porpoise are the most sensitive marine mammal species to underwater noise, and display the largest PTS/TTS risk zones within the underwater noise modelling. The species of concern will therefore be harbour porpoise, to represent a worst-case scenario. It is considered that the mitigation suggested to protect them will be effective at protecting any other species present within the working area.

Vibropiling

The risk of PTS onset would only be present if a harbour porpoise were to stay within 500m of the vibropiling works for a 24 hour period, which is highly unlikely. The proposed Marine Mammal Observation (MMO) protocol is contained within the Marine Mammal Protection Plan (Volume 3 Technical Appendix 8.2). By implementing the MMO protocol (to determine no marine mammals are present within the mitigation zone prior to vibropiling commencing) and assuming a maximum (worst-case scenario) 12 hour working day, there will be no risk of PTS to marine mammals, including seals, once they have vacated the mitigation zone.

Assuming that animals will flee as soon as they hear the noise from the vibropiling, the PTS range for any species is a maximum of 2m from the source of the noise. Whilst following the MMO protocol, an animal will not be this close to the vibropiling activities when they commence.

The TTS limits are all within 200m when assuming animals will flee from the noise source. Harbour porpoise could experience TTS out to ranges of 3.6km, 4.4km and 6.5km, however this is assuming that an animal is stationary for the duration of the noise (eight hours, 12 hours and 24 hours respectively), which is unlikely. The above ground noise of vibropiling has the potential to cause disturbance to any seals hauled out at the Ardersier haul-out site.

Dredging

The risk of PTS onset would only be present if a harbour porpoise were to stay within 570m of the dredging works for a 24 hour period, which is highly unlikely. By implementing the MMO protocol, there will be no risk of PTS to marine mammals, including seals, once they have vacated the mitigation zone.

Assuming that animals will flee as soon as they hear the noise from the dredging, the PTS range for any species is a maximum of 3m from the source of the noise. Whilst following the MMO protocol, an animal will not be this close to the dredging activities when they commence.

The TTS limits are all within 230m (within 2m for all species when excluding harbour porpoise) when assuming animals will flee from the noise source. Harbour porpoise could experience TTS out to ranges of 2.8km, 3.3km and 4.3km however this is assuming that an animal is stationary for the duration of the noise (eight hours, 12 hours and 24 hours respectively) which is unlikely.

The proposed dredge storage site is adjacent to the Ardersier haul-out site. Dredging activities and the disposal of dredged material could cause disturbance to any seals that are hauled-out.

10.08 **Statement of Significance**

It has been assessed that the primary risk from the works is to harbour porpoise, with consideration given to bottlenose dolphin, minke whale, killer whale, common dolphin, humpback whale and grey and common seal. This will be temporary minor disturbance from underwater noise associated with vibropiling and dredging. The noise is not predicted to cause long term negative effects on the local populations of the aforementioned species due to its short duration and to adherence to the detailed Marine Mammal Observation Protocol (MMOP) in Technical Appendix 8.2.

Given the mitigation which will be employed and the short term nature of the works producing underwater noise, the number of individuals affected will be negligible and any disturbance which may occur will not fall under the JNCC (2008) definition of significant disturbance. Therefore, it is considered that the MMOP will be sufficient to prevent short term negative effects.

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http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm

JNCC UK Marine Noise Registry: Information Document available at:
http://jncc.defra.gov.uk/pdf/MNT_DraftInfoDoc_V1_20160808.pdf

11.00 Water Environment

11.01 Introduction

EnviroCentre has undertaken, on behalf of Ardersier Port Ltd (the Applicant), a coastal processes assessment for the Proposed Development. This will update previous coastal investigation undertaken by EnviroCentre for developments consented in 2007 and 2013 at the Site.

This Chapter of 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 development are provided in Chapter 3: The Proposed Development. The assessment will identify sensitive issues within the site by establishing the current baseline and examining the site within this context.

This Chapter builds on previous studies undertaken at the Site to investigate and assess the likely impacts of the proposed dredging requirements on the water environment, coastal processes and associated statutory designated sites in and around Ardersier Port.

This Chapter is supplemented by the following appendices within Volume 3 of this EIAR, along with the relevant figures within Volume 3:

- Technical Appendix 11.1: Topographic and Bathymetric Survey
- Technical Appendix 11.2: Coastal Processes Assessment
- Technical Appendix 11.3: Sediment Transport Monitoring Plan

11.02 Scoping and Consultation

Chapter 2: EIA Process and Methodology details the Scoping exercise undertaken. A summary of the relevant scoping responses is contained within Technical Appendix 2.5.

11.03 Policy, Legislation and Guidance

The assessment presented within this chapter of the EIAR has been undertaken with reference to the following planning policy, legislation and guidance:

Relevant Planning Policy

- Scottish Planning Policy (SPP) (2014);
- UK Marine Policy Statement (2011);
- Scotland's National Marine Plan (2015); and
- Inner Moray Firth Local Development Plan (2015).

Relevant Legislation

- Water Framework Directive (WFD) 2000;
- Marine (Scotland) Act 2010;
- Coast Protection Act 1949;
- Flood Risk Management (Scotland) Act 2009;
- Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR);
- 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 Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017; and
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

Relevant Guidance

- Guidelines for Water Pollution Prevention from Civil Engineering Contracts;
- Pollution Prevention Guidance 1 (PPG): General guide to the prevention of pollution;
- PPG 3: Use and design of oil separators in surface water drainage systems (to be read in conjunction with 'Oil Separator Manufacturers – Version 7 – November 19th 2007);
- PPG 6: Working at construction and demolition sites;
- PPG 7 Safe operation of refuelling facilities;
- PPG 18: Managing for water and major spillages;
- PPG 26: Storage & handling of drums & intermediate bulk containers;
- Guidance for Pollution Prevention (GPP) 2: Above ground oil storage tanks;
- GPP 5: Works and maintenance in or near water;
- GPP 8: Safe Storage and Disposal of Used Oil;
- GPP 13: Vehicle washing and cleaning;
- GPP 21: Pollution Incident Response Planning;
- WAT-SG-26: Good Practice Guide – Sediment Management; and
- WAT-SG-29: Good Practice Guide – Construction Methods.

11.04 **Methodology**

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 and coastal processes;

- Consultation with key stakeholders to obtain relevant information and to ensure their concerns are addressed within the study;
- Establishing the existing baseline conditions:
  - Review topography and ground conditions at the site and environs;
  - Review of hydrology, catchment characteristics, and water quality conditions;
  - Review of coastal processes including bathymetry, tidal levels, river and tidal flow currents, wave action, bed sediment type and distribution, sediment transport and deposition, geology (Technical Appendix 11.2);
  - Hydrodynamic, wave and sediment transport modelling study to establish baseline and design conditions (Technical Appendix 11.2); and
  - 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.

Potential impacts arising from the Proposed Development have been predicted and evaluated. The observed baseline data was used along with professional opinion to qualitatively assess the potential impacts and the significance to receptors.

Assessment Criteria

Table 11.2 sets out the criteria for assessing receptor sensitivity. This has then been applied to the assessment of the significance of effects criteria set out in Chapter 2 of this EIAR. 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).

Table 11.1: 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. • 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 Sensitivity	Description
	• 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. • 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.

11.05 **Baseline Conditions**

Designated Areas

The following designated sites, with designations associated to the contents of this EIAR, are located within 5km of the Site:

- The Site encompasses Whiteness Head Site of Special Scientific Interest (SSSI), which is designated for coastal geomorphology, coastal features (saltmarsh, sand dunes and shingle) and marine features (sandflats).
- The Site encompasses parts of the Inner Moray Firth Special Protection Area (SPA) at Whiteness Head and Whiteness Sands, with the SPA designated for breeding, non-breeding and foraging birds.
- The Site is within the Moray Firth Special Area of Conservation (SAC), which is designated for marine features (including marine mammals) (bottlenose dolphin (*Tursiops truncatus*) and subtidal sandbanks).
- The Site is within the Inner Moray Firth RAMSAR site and is designated for marine features (including marine mammals) (intertidal mudflats and sandflats) and coastal features (saltmarsh, sand dunes and shingle).
- The western part of the Site encompasses designated haul-out sites for Grey and Common/Harbour Seals (Protection of Seals Orders).

Further information on designated areas is presented within the Habitats Regulations Appraisal in Technical Appendix 7.6.

Topography and Bathymetry

A topographic and multi-beam bathymetric survey of the Site was conducted in May 2018. The survey included the tidal inlet, the terrestrial components of the Site and spit, the intertidal and subtidal areas to the north, east and west of the spit, including the proposed dredge zone, and the intertidal and subtidal Whiteness Sands.

Levels from the 2018 multibeam bathymetric survey have been extracted at both 1m and 3m resolution. Full details of the survey extent, methodology and results are presented in Technical Appendix 11.1.

Previous bathymetric surveys of the tidal inlet, areas to the north and west of the spit and the proposed dredge zone, have been undertaken in 2007, 2012 and 2016. The 2007 and 2012 surveys also included topographic survey of the terrestrial components of the spit. These surveys have been compared using ground modelling software to assess any net change in extents and volumes (Technical Appendix 11.2).

The 2012 survey collected survey transects along the spit, resulting in areas that were interpolated between the transects. The relative consistency of the beach transects both in 2007 and 2012 demonstrated that this was a valid approach for comparison, however the location of the transects can be observed by a slight distortion in levels at regular intervals.

Surveyed depths within the 2018 bathymetry range between 0 and -22 m Chart Datum (CD), with a deep channel extending along the western central areas of the survey, between Whiteness Head spit and Whiteness Sands. The bathymetry is shown along with further detail on the bathymetric survey methodology in Technical Appendix 11.1.

Existing ground levels within the proposed footprint of the port development are typically 4.6m above Ordnance Datum (AOD) across main development area, with the access road rising to 25.18mAOD where is meets the B9092. The coastal areas drop down to sea level, while the crest of the spit is typically 3.9mAOD.

Geology and Sediment

Bedrock Geology

The majority of Site is underlain by Alves Formation (sandstone, pebbly (gravelly)) (Late Devonian Epoch), with the southeast of the access route to the site underlain by sandstone of the Inverness Sandstone Group (Mid Devonian Epoch).

Superficial Geology

The area underlying the Site is made raised ground associated with the previous development (the former McDermott Fabrication Yard) and consisting of sands from dredge arisings.

Whiteness Spit, Whiteness Sands and channel areas to the north are formed in sand deposits, as confirmed through sediment sampling (detailed in Technical Appendix

11.2). Gravel forms a key component of the terrestrial and intertidal spit, with the sampling information available indicating that the bed sediments within the proposed dredge pocket consist of gravels (23%), sands (75%) and silt/clay (2%).

Along the access road to the A96, the area southeast of the B9092 is underlain by Alturlie Gravels Formation (Sand and Gravel) with small areas of raised tidal flat deposits (clay, silt and sand) (Late Devensian). Approximately 0.3km north of the B9092 the access route is underlain by Ardersier Silts Formation (sand and silt). To the north of this area, the site is underlain by blown sand and Raised Marine Deposits of Holocene age (sand and gravel).

Soils

There are minimal/no soils across the majority of the Site, as it is underlain predominately by reclaimed sands, whilst the spit is relatively recently formed from sands and gravels (as described above and within Technical Appendix 11.2).

The Map of Topsoil Organic Carbon Concentrations indicates that soils across the majority of the Site are mineral soils and have negligible organic carbon concentrations. Along the access road to the A96 in the south, this increases slightly but remains typically <5% organic carbon concentration), with a small area of Class 5 soil (peat soils) where the access route crosses a small watercourse between the road crossing of the B9092 and the intersection with the A96.

Hydrology and Hydrogeology

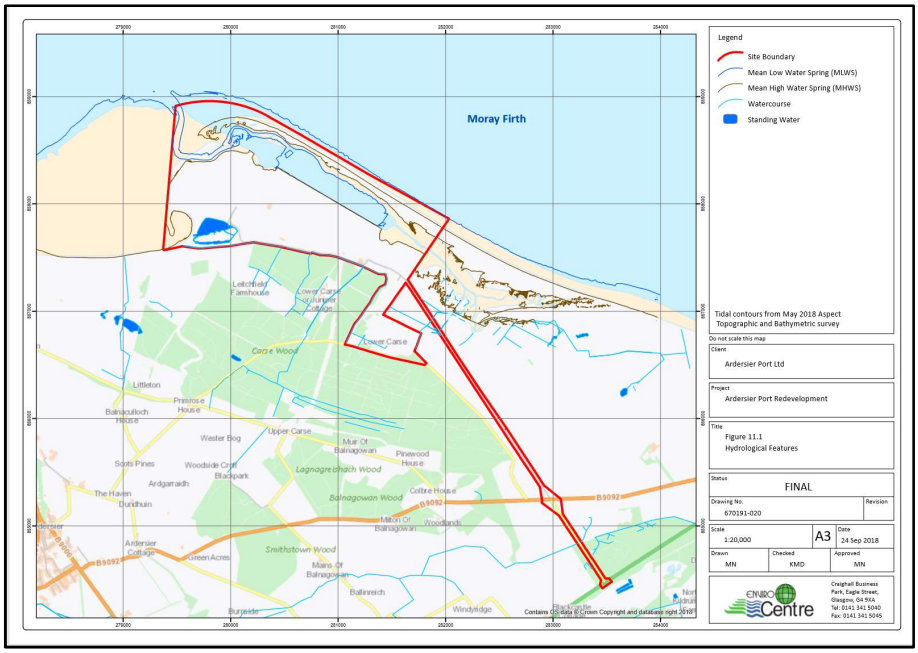
Hydrology

The inflows of freshwater to the tidal inlet to the southeast of Whiteness Head originate from springs to the southeast of the site, in the Carse of Delnies, and field drains to the south of the site, originating from the property of Blackpark and Carse Wood. As a result it is considered that the inflow of freshwater is insignificant relative to the much larger volume of seawater exchanged within the tidal inlet.

The majority of the Site is formed on reclaimed sand and previous drainage at the Site is generally considered to have been achieved through infiltration into the superficial deposits. Given the previous activity on the site and intrusive ground investigations, there is not expected to be any remnant active piped drainage systems within the previous development at the site.

The hydrological features in the vicinity of the Proposed Development are shown in Figure 11.1 below.

Figure 11.1: Hydrological Features



Hydrogeology

The bedrock aquifers of the Upper Old Red Sandstone and Middle Old Red Sandstone rock units, in the north and south of the Site, respectively, are both classified as being of moderate productivity in terms of groundwater yield (typically 1-10 l/s). The Upper Old Red Sandstone is a regionally important multi-layered aquifer with yields of up to 15 l/s to the south of Moray Firth. The Middle Old Red Sandstone is described as being flaggy in places, and consisting of siltstones, mudstones and conglomerates and interbedded lavas, which locally yields small amounts of groundwater.

<u>Water Quality, Sediment Quality and Coastal Waterbody Classification</u>

The coastal waters within the Site are classified under the Water Framework Directive (WFD) monitoring programme coastal waterbodies. SEPA's Water Environment Hub shows that there are two waterbodies that are within or are receiving waters from the site that contain WFD coastal water classifications, which are summarised in Table 11.3.

Table 11.3: WFD Coastal Water Classifications

Name (*SEPA ID*)	Water Body Type (Length/Area)	Classification (2016)
Hilton of Cadboll to Whiteness Head (*200501*)	Coastal waterbody (approximate area of 152.1km^2)	Overall: Good Overall Chemistry: Pass
Whiteness Head to Burghead (*200502*)	Coastal waterbody (approximate area of 173.3km^2)	Overall Good Overall Ecology: Good

Previous development proposals at the site, including dredging to reinstate the navigation channel and disposal of dredge arisings to land and sea, were consented in 2013 with the dredged sediment determined to be suitable for disposal to sea. No industrial activity has occurred at the site since this consent was granted. As a result, it is considered that the sediment remains of the same quality, and therefore suitable for disposal to land or sea.

Tidal Water Levels

Tidal levels at Ardersier Port (formerly McDermott base) as presented within the Admiralty Tide Tables are shown in Table 11.4. The mean tidal range at Ardersier Port is 3.3m during spring tides and 1.6m during neap tides.

Table 11.4: Tidal Water Levels – Ardersier Port

Tide Condition	Chart Datum (mCD)*	Ordnance Datum (mOD)
Highest Astronomical Tide (HAT)	4.8	+2.66
Mean High Water Spring (MHWS)	4.2	+2.06
Mean High Water Neap (MHWN)	3.3	+1.16
Mean Sea Level (MSL)	2.5	+0.36
Mean Low Water Neap (MLWN)	1.7	-0.44
Mean Low Water Spring (MLWS)	0.9	-1.24
Lowest Astronomical Tide (LAT)	0.2	-1.94

*Chart Datum correction for Ordnance Datum is -2.14m (relative to OD at Newlyn)

Extreme sea levels have been predicted around the whole UK coastline and published by the Environmental Agency/Department for Environmental Food and Rural Affairs report. These extreme levels include the effects of both tides and storm surge but not the effect of amplification within estuaries or sea lochs. In order to provide better estimates around the Scottish coastline, SEPA have updated the original estimates. As presented in Table **11Error**! No text of specified style in

document.. 11.5 the SEPA derived extreme sea levels, predicted at a point offshore from Ardersier Port, are 3.35m Above Ordnance Datum (AOD) for the 1 in 200 year return period event and 3.51mAOD for the 1 in 1,000 year return period event.

Table 11 Error! No text of specified style in document..**5: Ardersier Port Extreme Sea Levels (SEPA Dataset)**

Return Period (Years)	Water Level (mCD)	Water Level (mAOD)
2	0.77	2.91
5	0.86	3.00
10	0.93	3.07
50	1.08	3.22
100	1.15	3.29
200	1.21	3.35
1000	1.37	3.51

Tidal Currents

Hydrodynamic modelling undertaken for this assessment highlights the main tidal streams within the vicinity of the development Site. During the flood phase the main tidal stream passes from east to west, aligned with the spit closer in to shore, curving around the head of the spit into the tidal inlet, and spreading across Whiteness Sands from the north-east. During the ebb phase the main tidal stream reverses, passing generally from west to east, draining towards the north-eastern edge of Whiteness Sands, and turning east out of the tidal inlet around the head of the spit.

Modelled maximum current velocities at mid-flood during a spring tide occur in the main channel off the northern edge of Whiteness Sands (1m/s), and within the tidal inlet access channel adjacent to the spit head (0.85m/s). Across Whiteness Sands and within the tidal inlet observed current velocities are significantly lower.

Modelled maximum current velocities at mid-ebb during a spring tide again occur in the main channel off the northern edge of Whiteness Sands (1m/s), and within the tidal inlet access channel adjacent to the spit head (0.70m/s). Velocities across Whiteness Sands and within the tidal inlet are again significantly lower.

Modelled velocities generally reduce towards low and high tide across the Site and immediate surrounds, with localised variations in velocity determined by small scale bathymetric features and associated drainage patterns, particularly on Whiteness Sands.

Comparison of modelled peak flood and ebb spring tidal currents has been undertaken to examine residual current patterns within the vicinity of the development site (Technical Appendix 11.2). The results of this analysis highlight a dominant residual peak flood current extending from east to west around the head

of the spit across the north-eastern tip of Whiteness Sands, and also south into the tidal inlet. Further offshore a dominant residual peak ebb current is observed within deeper waters. Localised residual ebb current dominance is observed along the northern edge of Whiteness Sands.

Further details of tidal currents are presented within Technical Appendix 11.2.

Waves

In the Moray Firth the prevailing wind direction is from the southwest, whilst the offshore wave direction is predominantly from the northeast. Wind speeds in excess of 10m/s occur during winter months. Offshore significant wave heights (average height of the largest 1/3 of waves in a 15-20 minute dataset at 3 hour intervals) are typically less than 2m and rarely in excess of 3m.

Analysis of the Met Office offshore wind and wave data, shows the estimated 1 in 200 year return period offshore significant wave height is 5.18m, whilst the 1 in 2 year return period offshore significant wave height is 2.56m. Maximum wave heights are not included in the data, however, using a conservative approximation of maximum wave height being 2 times the significant wave height, the corresponding 200 and 2 year return period maximum wave heights would be in the order 10.4m and 5.1m respectively.

The nearshore wave climate in the vicinity of the development site has been examined by transformation of offshore wave conditions using Mike 21 FM SW (Flexible Mesh Spectral Wave Model) software as part of the coastal modelling study undertaken for this EIAR (see Technical Appendix 11.2). Significant wave height is typically less than 2m in the nearshore environment, with modelled significant wave heights generally slightly greater than half the corresponding offshore wave height.

Model results indicate that nearshore wave heights are greatest along the exposed eastern frontage of the spit, reducing around the head of the spit and into the more sheltered waters of Whiteness Sands.

Further details of wave climate and hydraulic modelling undertaken are presented within Technical Appendix 11.2.

A previous assessment of wave overtopping at Whiteness Spit (Technical Appendix 11.2) indicated that for the majority of the time, overtopping rates are relatively low and in the cases considered would not be a hazard. Some combinations of high water and more extreme waves will generate overtopping rates that are hazardous to pedestrians.

Coastal Processes and Sediment Transport

Recently collected data, including 2018 topographic and bathymetric survey (Technical Appendix 11.1), has been used along with previous assessments to update the coastal processes assessment. A detailed appraisal is contained in Technical Appendix 11.2 and the key findings are detailed in the following sections.

A review of historic maps (1845 – 2001) shows that generally the intertidal area of Whiteness Sands has remained stable over the period. Some localised changes are observed in offshore shoal zones. To the southeast of the development Site, around

the root of the spit, significant shoreline retreat is observed between 1845 and 1890, coincident with the initial extensions of the spit. Continued marginal erosion can be observed in this location throughout the map record. Progressive spit extension in a northwest direction is shown throughout the map record, with saltmarsh development to the lee of the spit. Following construction of the McDermott base, including the navigation channel, in 1972 a marked northwards extension of the most northerly portion of Whiteness Sands is observed. The navigation channel and harbour were subject to maintenance dredging until 2001-02. Further details are presented in section 3.5.1, Technical Appendix 11.2.

Comparison and analysis of successive bathymetric and topographic surveys from 2007, 2012, 2016 and 2018 allows investigation of the recent morphological evolution of Whiteness Head spit, Whiteness Sands and surrounds (section 3.5.2, Technical Appendix 11.2).

Away from the spit head, the eastern face of the spit around mean high water spring (MHWS) tide level appears to have experienced continuing retreat over recent years, with a general shallowing of the seaward cross-sectional profile. Estimated rates of retreat are between 1.4 to 2.6 metres per year (see Figure 3.20, Technical Appendix 11.2). This is consistent with the findings of the National Coastal Change Assessment (NCCA) recently commissioned by the Scottish Government.

The head of the spit continues to extend in both a north-westerly and westerly direction. Estimated rates of MHWS movement are between 10 – 24 metres per year. Below MHWS significant accumulation within the intertidal and subtidal zone is also observed between 2012 and 2018 (see Figure 3.19, Technical Appendix 11.2).

The former dredged channel has migrated in response to ongoing sedimentation, developing increased sinuosity, particularly since 2016. The channel is also observed to have both narrowed and deepened. The movement of the channel, and increase in sinuosity, has resulted in erosion to the eastern edge of Whiteness Sands in the immediate vicinity, as well as the development of some localised depositional features (Figure 3.18, Technical Appendix 11.2).

Within the tidal inlet significant deposition is observed along the north-western extent of the former quay face, extending south into the former berth areas. This deposition has resulted in the migration of the former dredged channel east towards the spit, with localised scour observed on the bed, and some erosion to the intertidal spit face.

To the northwest of the tidal inlet and spit head, some localised erosion is observed to the north-eastern tip of Whiteness Sands around the mean low water spring (MLWS) tide level. A corresponding accumulation of subtidal levels is observed further to the north-west.

As described within Technical Appendix 11.2, gravel forms a key component of the spit. Eroding from ancient deposits exposed on the open coast beach and subtidal areas. Individual clasts move under wave action alone, only in the intertidal area. Residual motion is always westwards and always towards the shore. As a body, this deposit is extending westwards by forming a thin gravel layer over the pre-existing sand deposits that form the bulk of the spit. The steady westward growth over the last century seems to relate to increased release of gravel in areas of up-drift coastal retreat. At its westward (growing) tip, where the underlying sand spit falls away,

wave refraction created a southward recurvature of the feature (sand with some shingle), which has moved over the former McDermott base navigation channel zone.

Sand transport modelling has been undertaken to further examine existing sediment transport patterns and pathways (see Technical Appendix 11.2). Model runs simulating 18 months of sand transport under present day (2018) conditions have been carried out.

The results highlight the north-western longshore transport of sand along the eastern face of the spit, driven by wave action and residual flood tidal currents, with the resultant subtidal build out of the spit head to the northwest. Examination of sand transport pathways highlights a north-western continuity of transport from the subtidal spit head to the northern subtidal fringe of Whiteness Sands, along with a feed of sand from the intertidal and subtidal spit head north into deeper offshore waters. A returning eastwards transport pathway from the northern edge of Whiteness Sands is highlighted further offshore, with an associated feed of material into the former dredged channel. An exchange of material between the intertidal and subtidal zones on the eastern face of the spit is observed. The model also shows the ongoing deposition of sand within the tidal inlet.

Towards the northern margin of Whiteness Sands the model runs indicate localised areas of erosion around the MLWS level, with material depositing immediately to the north in the subtidal zone. Across the vast majority of Whiteness Sands, particularly within central areas, the model runs indicate the sands are stable, with no significant movement of sediment observed. Along the southern shoreline of Whiteness Sands a clockwise transport of sand is highlighted, with deposition indicated to the southwestern corner.

A conceptual understanding of sediment transport and coastal morphology within the local coastal system (see Technical Appendix 11.2) has been developed through review of observed and historic changes, supplemented by hydraulic modelling. This conceptual model includes the longshore transport of sand and gravel along the eastern shore of Whiteness Head spit resulting continued spit extension, a continuity of this transport pathway both offshore to deeper waters, and west to the north-eastern intertidal and subtidal margin of Whiteness Sands. The conceptual model includes offshore movement of sand from the northern margin of Whiteness Sands, and a returning eastern transport pathway further offshore, which also contributes sediment to the tidal inlet, and the southern coastline of Whiteness Sands. Central areas of Whiteness Sands are considered to be generally stable.

This local coastal system has been subject to modification in the form of dredging for McDermott Fabrication Yard from the early 1970's until around 2002. This Site history remains an influence on present day processes, particularly on the extent and direction of spit head recurve, and on the volume of water exchanged within the tidal inlet. These have resultant localised impacts on currents and associated sediment transport processes, while the wider scale processes continue uninterrupted.

Flood Risk

The majority of the Site intended to be used as a port is shown as not being at risk of flooding. SEPA flood mapping indicates that the north eastern fringe of the Site

lies partly within the high likelihood (10% annual exceedance probability (AEP) or 1 in 10 year return period) coastal flood extent, and may therefore be at high risk of coastal flooding – with the areas shown as high likelihood located in the tidal zone. However, as outlined in the scoping response received from SEPA (Technical Appendix 2.3), given the coastal nature of the Site, water compatible nature of the development, and taking consideration of the results of previous flood risk assessments conducted for the Site, flood risk has been scoped out of the assessment.

11.06 **Potential Effects**

Scope of Assessment

The following topics have been scoped out of further assessment on the basis of consultation responses (Technical Appendix 2.3) and the baseline assessment:

- Hydrology;
- Hydrogeology;
- Geology (including soils); and
- Flood risk

Sensitive Receptors

The sensitive receptors (SR) to potential impacts on the water environment and coastal processes have been identified as the coastal waters of Whiteness Head and Whiteness Sands, Whiteness Head spit, Whiteness Sands, and the waters and sediment of the wider Moray Firth.

On the basis of the baseline assessment, Table 11.6 identifies the receptor sensitivity using the criteria outlined in Table 11.2.

Table 11.6: Receptor Sensitivity

Receptor	Sensitivity	Comment
Coastal Waters	High	Internationally or nationally designated site.
Whiteness Head Spit	High	Internationally or nationally designated site.
Whiteness Sands	High	Internationally or nationally designated site.
Wider Moray Firth	High	Internationally or nationally designated site.

Potential Impacts

This section identifies the potential environmental impacts on the water environment and coastal processes, at and around the Site, during the construction and operational phases of the Proposed Development.

The proposed works will involve the following key activities which have the potential to impact the water environment within the site and environs:

- Capital dredging of navigation channel and berths;
- Construction activities (port infrastructure including quay upgrades);
- Site surface water drainage; and
- Port operations.

The potential impacts on the water environment and coastal processes include:

- Water Environment:
  - Contamination of coastal water and sediments through spillages, leakages and/or sediment transfer (oils, fuels, welfare facilities and suspended solids).
  - Changes to surface run-off.
- Coastal Processes:
  - Changes in local wave climate.
  - Changes in local tidal regime.
  - Changes in local sediment transport regime (coastal morphology).

The potential interactions between water environment impacts and ecology are assessed within Chapter 7: Terrestrial Ecology and Ornithology, and Chapter 8: Marine Ecology.

The following sections consider the potential impacts and provide an assessment of likely level of significance.

Construction Phase

The potential impacts identified are assessed under the following headings:

- Surface Water Runoff;
- Water and Sediment Quality - Sediment Discharge and Dispersion from Dredging Works;
- Water and Sediment Quality - Pollution Incidences;
- Tidal Regime;
- Wave Climate; and
- Sediment Transport (Coastal morphology).

The degree of potential environmental impact is provided as appropriate.

Surface Water Runoff

During construction there is potential for increased runoff due to the introduction of impermeable and semi-permeable surfaces arising from the disturbance of existing ground cover and construction of proposed infrastructure. This could reduce the infiltration capacity and increase the rate and volume of direct surface runoff. The potential environmental effect of this is to increase or alter flow rates and routes, potentially leading to increases in erosion, sediment transport and associated hydro morphological impacts.

Given the coastal location of the Proposed Development, the permeable nature of the existing surfaces, permeable nature of the proposed surfaces, and the absence of draining watercourses, the potential impacts of surface water flow alterations and increased runoff are considered to be of a negligible magnitude prior to mitigation.

Water and Sediment Quality - Sediment Discharge and Dispersion from Dredging Works

The proposed dredging works could potentially cause plumes of suspended solids and a reduction in water quality with a resultant impact on aquatic life.

The dredge volume is estimated to be 2,300,000m^3, based on the 2018 bathymetry survey and proposed channel design. The sediment within the dredge pocket consists predominantly of sands, with gravel also present and only around 2% silt / clay.

Given the relatively coarse nature of the dredge budget it is considered that any plumes generated as a result of the dredging works will be very localised and short term in duration.

Overall it is considered that prior to mitigation the magnitude of impact of sediment discharge and dispersion from dredging works will be low within the immediate dredge area, and negligible out with this area in the wider Moray Firth.

Water and Sediment Quality - Pollution Incidences

During construction there is a risk of accidental pollution incidences affecting the water environment (i.e. coastal waters and sediment) 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 and 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 sediment could be detrimental to water/sediment quality, fauna and flora.

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 prior to mitigation may range from low to high.

Tidal Regime

The proposed construction works, including the proposed capital dredge requirement, could result in alterations to the local tidal regime. Hydrodynamic modelling has been undertaken using the MIKE by DHI software platform, to simulate up to six months of tidal conditions with and without the proposed development, to inform the assessment of the likely impact on tidal regime (Technical Appendix 11.2).

Details of tidal water levels within the Moray Firth in the vicinity of the Site are presented in Table 11.6 and Technical Appendix 11.2. Comparison of the modelling results with and without the proposed development (Technical Appendix 11.2) highlights that there will be no significant impact on tidal levels.

Hydrodynamic modelling results allow comparison of both flood and ebb tidal currents during a spring tidal cycle, with and without the Proposed Development. Comparison of the model results for the mid flood spring tidal currents (Technical Appendix 11.2) indicates that there would be localised reductions in tidal velocity (up to 0.5 m/s) within the immediate vicinity of the proposed dredge channel, and within the former the former dredged channel (up to 0.8 m/s) which will remain in situ post dredge. Further outside the immediate vicinity of the proposed dredge zone, comparison of modelling results indicates there would be no significant impact on tidal velocities during the flood tide.

Similarly, on the ebb tide comparison of modelling results (Technical Appendix 11.2) indicates reductions in current velocity (up to 0.4 m/s) within, and immediately adjacent to, the dredged channel, and within the former the former dredged channel (up to 0.6 m/s). Again, outside the immediate vicinity of the proposed dredge zone comparison of modelling results indicates there would be no significant impact on tidal velocities during the ebb tide.

Whilst the modelling results presented above indicate that the Proposed Development will produce localised changes in current velocities. It is considered that these variations are insignificant in terms of the wider hydrodynamic regime of the Moray Firth.

Overall, the impact of the Proposed Development on the tidal regime is considered to be of medium magnitude within the immediate vicinity of the site, low magnitude in the surrounds and negligible magnitude within the wider Moray Firth.

Wave Climate

The Proposed Development, including the proposed capital dredge requirement, could result in alterations to local wave climate within the site, and the wider Moray Firth. Spectral wave modelling has been undertaken using the MIKE by DHI software platform, to inform the assessment of the likely impact on the wave climate (Technical Appendix 11.2).

The Proposed Development site is most exposed to waves originating from the Outer Moray Firth to the north-east. Modelling results show that during a typical winter period storm from the north-east the proposed development results in a slight increase in significant wave height within the dredge zone and immediate vicinity (Technical Appendix 11.2). Outside the immediate vicinity of the proposed dredge zone the modelling indicates that the Proposed Development will have no significant impact on wave climate.

Overall, the impact of the Proposed Development on the wave climate is considered to be of medium magnitude within the dredge zone and immediate vicinity, low magnitude in the surrounds and negligible magnitude within the wider Moray Firth.

Sediment Transport (Coastal Morphology)

As outlined above and further described within Technical Appendix 11.2, sand transport modelling has investigated existing transport patterns and pathways in the vicinity of the development site under present day conditions.

Additional model runs have been undertaken to simulate sand transport patterns and pathways over an 18 month period following completion of dredging and construction works. The results of these model runs indicate that the longshore transport of sand along the eastern face of the spit will continue unaffected by the Proposed Development. The modelling highlights that whilst the north-western intertidal and subtidal build out of the spit will continue to the east of the dredged navigation channel, the channel will act as a trap to the further westward transport of sediment.

To the west of the new channel the model runs indicate that the remaining intertidal and subtidal head of the spit will be subject to ongoing erosion, with sand predominantly being transported further west into the existing the former dredged channel, and across the north-eastern fringe of Whiteness Sands, in line with present day processes. A smaller amount of sand is shown to move east into the new navigation channel immediately to the north of the remaining terrestrial spit head, which will remain as an island post dredging. Further south within the former dredged channel, the post-development lower energy conditions are predicted to result in increased deposition, particularly to the south-western lee of the remaining terrestrial spit head.

Further west across central parts of Whiteness Sands the model runs show limited movement, consistent with observed data and the conceptual understanding of transport in this area. The model runs indicate that present day processes will continue relatively unaffected by the development across Whiteness Sands. The model highlights the continued easterly subtidal transport pathway from the northern margin of Whiteness Sands, and a circulation of material into the remaining the former dredged channel.

Due to the large volume of sediment currently available within the local coastal system, it is considered that the removal of the proposed dredge budget to land will not be significant in terms of the wider system. Observed trends, model results and the conceptual understanding of local sediment transport processes (Technical Appendix 11.2) all indicate that potential impacts to sediment transport and coastal morphology will be localised in extent. It is considered that the longshore feed of sediment along the spit will continue, with change limited to the footprint and immediate vicinity of the dredge channel, and the north-eastern fringe of Whiteness Sands.

It is considered that the impact of the Proposed Development on sediment transport and coastal morphology within the immediate vicinity of the proposed dredge zone will be of medium magnitude, low magnitude in the surrounds and further from the reinstated navigation channel the magnitude will be negligible.

<u>Operational Phase</u>

The potential impacts identified are assessed under the following headings:

- Surface Water Runoff

- Water and Sediment Quality - Sediment Discharge and Dispersion from Dredging Works
- Water and Sediment Quality - Pollution Incidences
- Tidal Regime
- Wave Climate, and
- Sediment Transport (Coastal Morphology)

The degree of potential environmental impact is provided as appropriate.

Surface Water Runoff

As during construction, there is potential for increased runoff due to the presence of impermeable and semi-permeable surfaces. The impact of surface water flow alterations and increased runoff would be of a negligible magnitude prior to mitigation measures due to the coastal location of the development.

Water and Sediment Quality

Maintenance dredging will be required, the likely effects of which would be of a similar nature, albeit lower order, than that of the capital dredge during construction.

There is unlikely to be any groundworks during the operational phase, and therefore the risk of erosion and sedimentation will be much lower than during construction. The potential risk of pollution from spillages will however remain during the operational phase. Additionally, there is the potential risk of contamination of surface water runoff from the development platform, as well as contamination of coastal waters as a result of discharges from visiting boats.

The impacts on water quality would therefore range from low to high magnitude prior to mitigation measures.

Tidal Regime

The impact of the Proposed Development during the operational phase on the tidal regime within the Site is considered to be the same as during the construction phase. Therefore the magnitude of impact on the tidal regime is considered to be of medium magnitude within the immediate vicinity of the Site, low magnitude in the surrounds and negligible magnitude within the wider Moray Firth.

Wave Climate

The impact of the Proposed Development during the operational phase on the wave climate within the Site is considered to be the same as during the construction phase. Therefore the magnitude of impact on the wave climate is considered to be of medium magnitude within the immediate vicinity of the Site, low magnitude in the surrounds and negligible magnitude within the wider Moray Firth.

Sediment Transport

The impact of the Proposed Development during the operational phase on sediment transport within the Site is considered to be the same as during the construction phase. Therefore the magnitude of impact on sediment transport is considered to

be of medium magnitude within the immediate vicinity of the Site, low magnitude in the surrounds and negligible magnitude within the wider Moray Firth.

11.07 **Cumulative Assessment**

From the sites identified in the cumulative effects section in Chapter 2 of the EIAR, the Proposed Development is not predicted to add to the associated impacts from any of these sites, due to the localised nature of predicted impacts and the distance between the Site and those sites considered in the cumulative assessment.

11.08 **Mitigation**

Mitigation aims to avoid, manage, control and further minimise environmental impacts. Forms of mitigation applicable to the potential impacts predicted are:

- Design led active mitigation; and
- Procedural and best practice mitigation (CEMD, Technical Appendix 3.3); and
- Sediment monitoring to inform future works as outlined in Technical Appendix 11.3.

Design Mitigation

Design led mitigation that has been applied can be summarised as follows:

- No dredging to take place during November to March to avoid the wintering birds season. If dredging is required in October this can only occur with the approval of Marine Scotland in consultation with SNH.
- Site investigation has determined the nature of dredge sediments, dredge material will be initially being deposited directly via a discharge pipeline to the inner channel as reinstatement to the inner face of the spit in the location of former turning circle excavation (200,000 m^3). Following this, dredge sediments (2,100,000 m^3) will be deposited onshore to designated areas within the site boundary for subsequent re-use. Further details of site investigation and dredge disposal are presented in the Best Practicable Environmental Option (BPEO) report (Technical Appendix 3.9).
- Hydrodynamic, wave and sediment transport modelling has been undertaken to assess the impact of the design of the proposed development.

Construction Phase Mitigation

General Management

A Construction Environmental Management Document (CEMD) has been developed as Technical Appendix 3.3 to ensure that the mitigation measures outlined in the EIAR are followed during the proposed construction works. The CEMD includes surface water management and pollution prevention measures (e.g. Pollution Prevention Plan), and will be in place during construction and operation.

The CEMD will remain a live document and will be continually updated as the work progresses. The CEMD 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 CEMD 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, 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 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.

Dredged Material

When the dredged material is placed on land, mitigation measures will be required to control runoff from the deposited material due to the water content in the material pumped ashore. This will be achieved by using bunds to contain the pumped material, formed from dredged arisings, with surplus water allowed to seep back into the surrounding ground or be piped by gravity back to the shore. 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.

Surface Water Management

The surface water drainage will be designed to ensure that there are no untreated surface water discharges directly to surrounding coastal waters. It is proposed to 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.

Site Compounds

Runoff from compounds will be captured and passed through construction drainage features prior to discharge. Foul drainage will either be contained in a closed system and disposed of at a suitable off-site facility or where possible directed via a connection to the Scottish Water foul drainage system.

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 PPG6:

- 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 CEMD 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.

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 PPG and GPP 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 be not permitted.
  - The bund 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.
  - 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.

Operational Phase Mitigation

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.

Dredged Material

Longer term management of runoff from the land based stockpile of material will adopt a similar approach to the active deposition phase, while the risk of windblown sediments being mobilised will be mitigated against by a suppressant system to the surface of the stockpile. These longer term mitigation measures will be organised by Ardersier Port.

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 (refer to section 11.03).

Oil, Fuel, Site Vehicle Use and Storage

The Site'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.

Monitoring and Enhancement

Ardersier Port Limited 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 and Marine Scotland.

A Sediment Transport Monitoring Plan (Technical Appendix 11.3) will be adopted to provide relevant information on sediment transport, erosion and deposition within the area of Whiteness Spit, Whiteness Sands and Ardersier Port, to inform future maintenance dredge works. The objectives of this plan are to:

- Define the scope of the type and frequency of monitoring that will be undertaken;
- Define areas that will be monitored to assess sediment transport;
- Collect data to compare with modelling predictions for dredged material deposited at the spoil ground;
- Provide data for analysis or modelling to design future maintenance dredge operations; and
- Inform the Natural Heritage Management Plan (Technical Appendix 7.7).

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, CEMP, 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).

11.09 **Residual Effects**

The residual effects expected to arise following implementation of the mitigation measures detailed above are summarised within Table 11.7. 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 either major, moderate or negligible.

Table11 Error! No text of specified style in document.**.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									
Surface Water Runoff	Coastal Waters of Whiteness Head and Sands	High	Terrestrial construction works	Negative	Short - Permanent	Possible	Negligible	Negligible	Negligible
	Whiteness Head Spit	High	Terrestrial construction works	Negative	Short	Possible	Negligible	Negligible	Negligible
	Whiteness Sands	High	Terrestrial construction works	Negative	Short	Possible	Negligible	Negligible	Negligible
	Wider Moray Firth	High	Terrestrial construction works	Negative	Short	Possible	Negligible	Negligible	Negligible
Sediment discharge and dispersion	Coastal Waters of Whiteness Head and Sands	High	Construction including capital dredge	Negative	Short	Likely	Low	Low	Moderate
	Whiteness Head Spit	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)
	Whiteness Sands	High	Construction including capital dredge	Negative	Short	Unlikely	Low	Low	Moderate
	Wider Moray Firth	High	Construction including capital dredge	Negative	Short	Unlikely	Negligible	Negligible	Negligible
Pollution incidences	Coastal Waters of Whiteness Head and Sands	High	Construction oils, fuels & concrete	Negative	Short	Possible	Low - High	Low	Moderate
	Whiteness Head Spit	High	Construction oils, fuels & concrete	Negative	Short	Possible	Low – High	Low	Moderate
	Whiteness Sands	High	Construction oils, fuels & concrete	Negative	Short	Possible	Low – High	Low	Moderate
	Wider Moray Firth	High	Construction oils, fuels & concrete	Negative	Short	Possible	Low – High	Low	Moderate
Changes to tidal regime	Whiteness Head Spit	High	Construction including capital dredge	Negative	Long	Certain	Medium	Medium	Major

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)
	Whiteness Sands	High	Construction including capital dredge	Negative	Long	Certain	Low	Low	Moderate
	Wider Moray Firth	High	Construction including capital dredge	Negative	Long	Certain	Negligible	Negligible	Negligible
Changes to wave climate	Whiteness Head Spit	High	Construction including capital dredge	Negative	Long	Certain	Medium	Medium	Major
	Whiteness Sands	High	Construction including capital dredge	Negative	Long	Certain	Low	Low	Moderate
	Wider Moray Firth	High	Construction including capital dredge	Negative	Long	Certain	Negligible	Negligible	Negligible
Changes to sediment transport (coastal morphology)	Whiteness Head Spit	High	Construction including capital dredge	Negative	Long	Certain	Medium	Medium	Major

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)
	Whiteness Sands	High	Construction including capital dredge	Negative	Long	Certain	Low	Low	Moderate
	Wider Moray Firth	High	Construction including capital dredge	Negative	Long	Certain	Negligible	Negligible	Negligible
Operational Phase									
Surface Water Runoff	Coastal Waters of Whiteness Head and Sands	High	Operational activities	Negative	Short - Permanent	Possible	Negligible	Negligible	Negligible
	Whiteness Head Spit	High	Operational activities	Negative	Short	Possible	Negligible	Negligible	Negligible
	Whiteness Sands	High	Operational activities	Negative	Short	Possible	Negligible	Negligible	Negligible
	Wider Moray Firth	High	Operational activities	Negative	Short	Possible	Negligible	Negligible	Negligible
Sediment discharge and dispersion	Coastal Waters of Whiteness Head and Sands	High	Operational activities including any maintenance	Negative	Short	Likely	Low	Low	Moderate

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)
			dredge requirements						
	Whiteness Head Spit	High	Operational activities including any maintenance dredge requirements	Negative	Short	Unlikely	Negligible	Negligible	Negligible
	Whiteness Sands	High	Operational activities including any maintenance dredge requirements	Negative	Short	Unlikely	Low	Low	Moderate
	Wider Moray Firth	High	Operational activities including any maintenance dredge requirements	Negative	Short	Unlikely	Negligible	Negligible	Negligible
Pollution incidences	Coastal Waters of Whiteness Head and Sands	High	Operation oils and fuels	Negative	Short	Possible	Low - High	Low	Moderate
	Whiteness Head Spit	High	Operation oils and fuels	Negative	Short	Possible	Low – High	Low	Moderate

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)
	Whiteness Sands	High	Operation oils and fuels	Negative	Short	Possible	Low – High	Low	Moderate
	Wider Moray Firth	High	Operation oils and fuels	Negative	Short	Possible	Low – High	Low	Moderate
Changes to tidal regime	Whiteness Head Spit	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Medium	Medium	Major
	Whiteness Sands	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Low	Low	Moderate
	Wider Moray Firth	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Negligible	Negligible	Negligible
Changes to wave climate	Whiteness Head Spit	High	Operational port including any maintenance	Negative	Long	Certain	Medium	Medium	Major

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)
			dredge requirements						
	Whiteness Sands	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Low	Low	Moderate
	Wider Moray Firth	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Negligible	Negligible	Negligible
Changes to sediment transport (coastal morphology)	Whiteness Head Spit	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Medium	Medium	Major
	Whiteness Sands	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Low	Low	Moderate

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)
	Wider Moray Firth	High	Operational port including any maintenance dredge requirements	Negative	Long	Certain	Negligible	Negligible	Negligible

11.10 **Statement of Significance**

There are residual effects that are considered to be of major and moderate significance, therefore under the EIA regulations these effects are considered to be significant.

The residual effects considered to be major relate to Whiteness Head Spit and the associated designations. The residual effects are concentrated at the head of the spit where the navigation channel will be reinstated. The 4.6 km SSSI designated length of spit to the east of the navigation channel (over 90% of the designated feature) will be subject to negligible impact. This area of the spit around the navigation channel was previously actively maintained from 1972-2001 and the impacts will be similar to those previously experienced during that time.

The residual effects considered to be moderate relate to Whiteness Sands and localised sediment disturbance from dredging and possible pollution incidents. The significance of these effects is due to the designations of the receptors identified. The residual effects are limited to the north eastern area of Whiteness Sands, resulting in the majority of the designated areas of the sands being subject to negligible impact.

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12.00 Mitigation

12.01 **Introduction**

Where significant adverse effects have been identified, mitigation measures are proposed to prevent, reduce or offset these effects. Mitigation measures have been identified within each of the technical chapters within the EIAR (Chapter 6 – 11).

Table 12.1 below details a Schedule of Mitigation. This schedule has been prepared to provide to provide a clear and concise summary of all mitigation measures proposed.

A Schedule of Mitigation is included within the CEMD included within Technical Appendix 3.3.

12.02 **Mitigation Schedule**

The Mitigation Schedule details the mitigation measures and environmental commitments that have been identified in each of the EIAR technical assessments. The schedule also identifies the timing of the implementation of the mitigation measures as:

- Pre-construction: The design, planning and preparation phase before any physical activity is undertaken on site
- Construction: Undertaking physical works to construct the Proposed Development.
- Operation: When the Proposed Development is fully operational as a port and for port related services.

Table 12.1: Schedule of Mitigation

Relevant Environmental Topic	Mitigation Measure	Timing/Status
General	Maintain a Construction Environmental Management Document (CEMD).	Pre-construction/ Construction. CEMD has been prepared and included in Technical Appendix 3.3
General	Maintain updated Schedule of Mitigation to include all mitigation proposed in support of the Harbour Revision Order, marine licenses and planning conditions (Table 12.1 Schedule of Mitigation and Technical Appendix 3.3).	Pre-construction/ Construction and Operation. Schedule of Mitigation has been prepared and included within CEMD in Technical Appendix 3.3.
General	Appoint an Environmental Clerk of Works (ECoW).	Pre-construction/ Construction. EcoW has been identified.

Relevant Environmental Topic	Mitigation Measure	Timing/Status
General	Establish an Ecological Management Group (EMG) to advise and support the design and implementation of mitigation measures and to undertake ongoing monitoring of designated sites and protected species. Composition of the group is as stated in the Statutory Approvals.	Pre-construction. An Ecological Management Group has been established.
General	Develop and implement a Reporting Protocol which sets out what the Licensee must do on discovering any marine archaeology.	Construction. Protocol has been prepared and included in CEMD in Technical Appendix 3.3.
General	Pollution Prevention Plan mitigation measures undertaken in accordance with best practice.	Construction/ Operation. Pollution Prevention Plan has been prepared and is included in the CEMD in Technical Appendix 3.3.
General	Dust management mitigation measures undertaken in accordance with best practice.	Construction/ Operation. Dust Management Plan has been prepared and is included in the CEMD in Technical Appendix 3.3.
General	Waste management mitigation measures undertaken in accordance with best practice.	Construction/ Operation. Waste Management Plan has been prepared and is included in the CEMD in Technical Appendix 3.3.
General	Construction Traffic Management Plan	Construction. To be developed by appointed contractor.
Shipping and Navigation	Construction Risk Assessment: a) Preparation of detailed Construction and Environmental Plans prior to specific elements of work commencing and to be agreed with SEPA and SNH. b) Preparation of detailed risk assessment and health and safety plans in advance of dredging operations. Notices to Mariners and notification to stakeholders to be issued in advance of marine constructions works commencing	Construction. To be developed by appointed contractor.
Shipping and Navigation	Develop Operational Risk Assessment and procedures in accordance with statutory requirements.	Operation. To be developed by appointed Harbourmaster.

Relevant Environmental Topic	Mitigation Measure	Timing/Status
Terrestrial Ecology and Ornithology	Prepare a Natural Heritage Management Plan	Pre-construction. This has been prepared and is included in Technical Appendix 7.7.
Terrestrial Ecology and Ornithology	Implement habitat enhancement measures appropriate to the stage of the development.	Construction. Habitat enhancement measures have been identified in the CEMD in Technical Appendix 3.3.
Terrestrial Ecology and Ornithology	Implementation of General Ecological Mitigation Measures detailed within the CEMD.	Pre-construction/ Construction. Ecological mitigation measures contained within the CEMD in Technical Appendix 3.3.
Terrestrial Ecology and Ornithology	Formation of the Storage Area Bunds A Permanent bund will be constructed to provide screening of potential coastal bird roost sites.	Pre-construction/ Construction. Details included within the Natural Heritage Management Plan contained within Technical Appendix 7.7.
Marine Ecology	Implementation of mitigation measures against the introduction of non-native species.	Construction. Details of measures to mitigate against the introduction of non-native species are contained within the CEMD in Technical Appendix 3.3.
Marine Ecology	Implementation of Marine Mammal Protection Plan (MMPP)	Pre-Construction/Construction. A Marine Mammal Protection plan has been prepared and is included in Technical Appendix 8.2.
Marine Ecology	Implement a Seal Injury Avoidance Scheme ("SIAS")	Pre-construction and Construction. A Marine Mammal Protection plan has been prepared and is included in Technical Appendix 8.2.
Marine Ecology	No dredging operations take place during November to March	Construction/ Operation
Airborne Noise and Groundborne Vibration	Implement Noise and Vibration Plan.	Pre-construction and Construction. Noise and Vibration Plan included within CEMD in Technical Appendix 3.3.
Underwater Noise	Addressed under general mitigation measures and marine ecology mitigation detailed above	Construction/ Operation

Relevant Environmental Topic	Mitigation Measure	Timing/Status
Water Environment	Adoption of Sediment Transport Monitoring Plan Other mitigation measures applicable to the water environment are addressed above through the adoption of the Pollution Prevention Plan and restriction on timescales for dredging works.	Construction/ Operation

13.00 Summary of Residual Effects

13.1 Summary of Residual Effects

This EIAR has been prepared to identify if significant effects are likely to occur as a result of the Proposed Development. Where significant effects have been identified, mitigation measures have been proposed. Mitigation measures have also been proposed to promote best practice. The mitigation measures proposed are identified within the relevant technical Chapters and accompanying Technical Appendices. A Schedule of Mitigation is contained within Chapter 12.

Residual effects are the significant effects that remain after the mitigation measures have been implemented. An assessment of residual effects is contained within the relevant technical Chapters (Chapter 6 – 11). Table 13.1 below provides a summary overview of the residential effects of the Proposed Development, following mitigation.

Table 13.1: Summary of Residual Effects

Relevant Environmental Topic	Residual Effect	Commentary
Shipping and Navigation	Negligible	
Terrestrial Ecology and Ornithology	Moderate	Following the effective implementation of mitigation measures, which have been designed following review of the engineering design and construction techniques, significant adverse effects from the construction phase will be suffered by the Lichen Assemblage. These effects are as a result of the habitat loss during the proposed capital dredge, and are assessed as of Local significance. Adverse effects on all other IEFs pertaining to terrestrial ecology and ornithology will not be significant. Relevant legislation and planning policies will be adhered to, and local and UKBAP targets will remain unaffected, and the integrity of all designated sites will remain intact. It is also concluded that there are significant positive effects from the construction phase will benefit qualifying species of the locally designated sites, and bird aggregations in the area, through the creation of a new island which will enable birds to roost, and potentially breed, without disturbance or land predation. These effects are assessed as of Regional significance.
Marine Ecology	Negligible	
Airborne Noise and Groundborne Vibration	Negligible	
Underwater Noise	Negligible	

Relevant Environmental Topic	Residual Effect	Commentary
Water Environment	Major/Moderate	Moderate residual effect on coastal waters, Whiteness Head Spit and Whiteness Sands from sediment discharge and dispersion and from pollution incidences. Major residual effect on Whiteness Head Spit and moderate residual effect on Whiteness Sands from changes to tidal regime. Major residual effect on Whiteness Head Spit and moderate residual effect on Whiteness Sands from changes to wave climate. Major effect on Whiteness Head Spit and moderate effect on Whiteness Sands from changes to sediment (coastal morphology). The residual effects considered to be major relate to Whiteness Head Spit and the associated designations. The residual effects are concentrated at the head of the spit where the navigation channel will be reinstated. The 4.6 km SSSI designated length of spit to the east of the navigation channel (over 90% of the designated feature) will be subject to negligible impact. This area of the spit around the navigation channel was previously actively maintained from 1972-2001 and the impacts will be similar to those previously experienced during that time. The residual effects considered to be moderate relate to Whiteness Sands and localised sediment disturbance from dredging and possible pollution incidents. The significance of these effects is due to the designations of the receptors identified. The residual effects are limited to the north eastern area of Whiteness Sands, resulting in the majority of the designated areas of the sands being subject to negligible impact.

13.2 Summary of Cumulative Effects

No significant cumulative effects are predicted to arise as a result of the combined effects of the Proposed Development on different environmental discipline specific effects on a single receptor/resource.

No significant cumulative effects are predicted in relation to the construction and operation of the Proposed Development in combination with the other existing or committed projects and developments within the vicinity of the Site.