Statkraft Hydrogen UK Holding Limited

Tagdale Green Ammonia Project

Scoping Report

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EXECUTIVE SUMMARY

Statkraft Hydrogen UK proposes the Tagdale Green Ammonia Project, a hydrogen to green ammonia facility of up to 80 MegaWatts (MW), located at Dales Voe, Shetland. The project will produce up to 185 tonnes/day of green ammonia for decarbonising fertiliser production, maritime fuels, and energy storage. Marine elements include a new 160 metre (m) export jetty and associated subsea/nearshore infrastructure below Mean High Water Spring (MHWS). These components require a Marine Licence under the Marine (Scotland) Act 2010, alongside planning consent for the shore based terrestrial infrastructure.

This Scoping Report establishes for all relevant marine topics a focused set of potential significant effects to be addressed within the Environmental Impact Assessment (EIA) Report to accompany the marine licence application. A formal Scoping Opinion is sought from Marine Directorate – Licensing Operations Team (MD-LOT) to inform the EIA Report. A parallel scoping exercise has been performed by the terrestrial EIA contractor with Shetland Islands Council (SIC).

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GLOSSARY OF TERMS

TERM	DEFINITION
Environmental Impact Assessment (EIA)	The statutory process of evaluating the likely significant effects of a proposed project or development. Assessment of the potential impact of the proposed Project on the physical, biological and human environment during construction, operation and maintenance.
European Protected Species (EPS)	Animals and plants (species listed in Annex IV of the Habitats Directive) that are afforded protection under the Habitats Regulations.
Marine Protected Area (MPA)	Marine Sites protected under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 between 12 – 200NM. In Scotland MPAs are areas of sea and seabed designated to protect significant and threatened marine habitats or species.
Mean High Water Springs	The height of Mean High Water Springs (MHWS) is the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
Mean Low Water Springs	The height of Mean Low Water Springs (MLWS) is the average throughout the year, of two successive low waters, during a 24-hour period in each month when the range of the tide is at its lowest.
Nature Conservation Marine Protected Area	A Marine Protected Area (MPA) designated by Scottish Ministers in the interests of nature conservation under the Marine (Scotland) Act 2010.
Tagdale Green Ammonia Project ('The Project')	The project is the term used to describe the Tagdale Green Ammonia Project. The Project is the construction of an electrolytic hydrogen to green ammonia production facility of up to 80 Megawatts (MW) located in Dales Voe sea loch. This will involve the construction of the green ammonia facility and associated infrastructure above MLWS and the construction of a jetty below MHWS for export of ammonia by ship. The Project is the focus of this Environmental Impact Assessment (EIA) Scoping Report.

LIST OF ACRONYMS

ACRONYM	DEFINITION
AA	Appropriate Assessment
AEZ	Archaeological Exclusion Zone
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
ATT	Admiralty Total Tide
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Survey
BODC	British Oceanographic Data Centre
CEA	Cumulative Effects Assessment
CEFAS	Centre for Environment, Fisheries, and Aquaculture Science
CEMP	Construction Environmental Management Plan
CES	Crown Estate Scotland
CIEEM	Chartered Institute of Ecology and Environmental Management
COWRIE	Collaborative Offshore Wind Research into the Environment
CSEMP	Clean Seas Environmental Monitoring Programme
DBA	Desk-Based Assessment
DECC	Department of Energy and Climate Change
EC	European Commission
EcIA	Ecological Impact Assessment
EEC	European Economic Community
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EPS	European Protected Species
EU	European Union
EUNIS	European Nature Information System
FAD	Fish Aggregation Device
FeAST	Feature Activity Sensitivity Tool
FPU	Floating Production Unit
FSA	Formal Safety Assessment

ACRONYM	DEFINITION
FU	Functional Unit
GPP	General Planning Principles
GHG	Greenhouse Gas
GPP	Guidance for Pollution Prevention
GIS	Geographic Information System
HAT	Highest Astronomical Tide
HEPS	Historic Environment Policy Statement for Scotland
HES	Historic Environment Scotland
HRA	Habitats Regulations Appraisal
HSE	Health and Safety Executive
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IAMMWG	Inter-Agency Marine Mammal Working Group
IBTS	International Bottom Trawl Survey
ICE	Institution of Civil Engineers
ICCI	In-combination Climate Change Impact
ICES	International Council for the Exploration of the Sea
IFG	Inshore Fisheries Group
IHLS	International Herring Larvae Survey
IMO	International Maritime Organization
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
IUCN	International Union for Conservation of Nature
JCDP	Joint Cetacean Data Programme
JNAPC	Joint Nautical Archaeology Policy Committee
JNCC	Joint Nature Conservation Committee
LNCS	Local Nature Conservation Site
LPG	Liquified Petroleum Gas
LSE	Likely Significant Effect
MAIB	Marine Accident Information Board
MA&D	Major Accidents and Disasters
MarLIN	Marine Life Information Network

ACRONYM	DEFINITION
MARPOL	International Convention for the Prevention of Pollution from Ships
MCA	Maritime and Coastguard Agency
MCCIP	Marine Climate Change Impacts Partnership
MD-LOT	Marine Directorate - Licensing Operations Team
MEHRA	Marine Environmental High-Risk Area
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MPA	Marine Protected Area
MPCP	Marine Pollution Contingency Plan
MSA	Merchant Shipping Act
MSFD	Marine Strategy Framework Directive
MW	Megawatt
NAS	No Alternative Solutions
NBN	National Biodiversity Network
NCCA	National Coastal Change Assessment
NCMPA	Nature Conservation Marine Protected Area
NLB	Northern Lighthouse Board
NM	Nautical Mile
NMP	National Marine Plan
NRA	Navigational Risk Assessment
NRHE	Record of the Historic Environment
NSP	Navigational Safety Plan
NTSLF	National Tidal and Sea Level Facility
OESEA	Offshore Energy Strategic Environmental Assessment
OSPAR	Convention for Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention 1992)
PAC	Pre-application Consultation
PAD	Protocol for Archaeological Discoveries
PAS	Publicly Available Specification

ACRONYM	DEFINITION
PMF	Priority Marine Feature
PSD	Particle-Size Distribution
psu	practical salinity units
RBMP	River Basin Management Plan
RIAA	Report to Inform Appropriate Assessment
RICS	Royal Institution of Chartered Surveyors
RNLI	Royal National Lifeboat Institution
RoW	Receiver of Wreck
RSPB	Royal Society for the Protection of Birds
RYA	Royal Yachting Association
SAC	Special Area of Conservation
SBRC	Shetland Biological Records Centre
SCANS	Small Cetaceans in the European Atlantic and North Sea
SCI	Site of Community Importance
SCOS	Special Committee on Seals
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SHA	Statutory Harbour Authority
SIC	Shetland Islands Council
SIRMP	Shetland Islands Regional Marine Plan
SLVIA	Seascape, Landscape and Visual Impact Assessment
SMRU	Sea Mammal Research Unit
SNH	Scottish Natural Heritage
SOLAS	International Regulations for the Safety of Life at Sea
SoM	Schedule of Mitigation
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
SSMO	Shetland Shellfish Management Organisation
SSSI	Site of Special Scientific Interest
SWPA	Shellfish Water Protected Area
UKCP	UK Climate Projections
UKHO	UK Hydrodynamic Office

ACRONYM	DEFINITION
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VMP	Vessel Management Plan
VMS	Vessel Monitoring System
VP	Vantage Point
WCA	Wildlife and Countryside Act
WEI	Wave Exposure Index
WFD	Water Framework Directive
WWTW	Waste Water Treatment Works
ZTV	Zone of Theoretical Visibility

1 INTRODUCTION

Statkraft Hydrogen UK Holding Limited (Statkraft) is proposing to develop a new green ammonia facility in Dales Voe sea loch. The site is located approximately 3.5 km to the north of the capital of Shetland, Lerwick, Mainland Shetland. The Tagdale Green Ammonia Project involves the construction of an electrolytic hydrogen to green ammonia production facility of up to 80 Megawatts (MW) (hereafter referred to as 'the Project'). The facility will utilise renewable energy to produce green hydrogen which will then be processed into green ammonia. The Project involves the construction of the green ammonia facility and associated infrastructure above Mean Low Water Springs (MLWS) and the construction of a jetty below Mean High Water Springs (MHWS) for export of ammonia by ship. The Project will produce up to 185 tonnes of ammonia per day that will be used within the existing ammonia market to decarbonise fertiliser production, as a sustainable fuel for marine shipping and sustainable power generation. Due to the marine and terrestrial components, the Project will require a marine licence under the Marine (Scotland) Act 2010 for infrastructure below MHWS and planning permission under the Town and Country Planning (Scotland) Act 1997 for aspects above MLWS.

As the new ammonia export jetty is capable of accommodating vessels of over 1,350 tonnes, the Project is considered to be a Schedule 1 Project under article 8(2) of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Statkraft is going to conduct an Environmental Impact Assessment (EIA) for the Project and submit the terrestrial EIA Report alongside the planning permission application in the second half of 2026. Marine licence application under the Marine (Scotland) Act 2010 and the marine EIA Report under the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 will be submitted early 2027. Prior to the EIA preparation, Statkraft wishes to ascertain the scope and level of detail of information to be provided in the EIA Report, and is seeking a formal Scoping Opinion from the Scottish Government's Marine Directorate - Licensing Operations Team (MD-LOT) under Regulation 14 of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017. This EIA Scoping Report has been prepared to accompany the EIA Scoping Opinion request and details the marine components of the Project (i.e. licensable marine activities below MHWS, hereafter referred to as 'the Marine Project'). A separate Scoping Opinion request has been made to the terrestrial regulator, SIC, for the Project components above MLWS.

Statkraft intends to submit a separate EIA Report for the planning authority, SIC, and to MD-LOT for the terrestrial and marine components, respectively.

1.1 Purpose of this Report

This EIA Scoping Report has been generated to ensure that the relevant potentially significant environmental impacts of the Marine Project are taken forward for assessment and inclusion within the EIA Report. The aim of this Scoping Report is therefore to provide sufficient information to allow MD-LOT and relevant marine consultees to confirm the potential environmental impacts of the Marine Project that are to be considered within the EIA Report. This approach has been designed to result in a proportionate and efficient EIA, with effort focussed on topics which could be significant and require further consideration to understand their effects. This approach will facilitate the minimisation of any negative effects, as far as practicable, and the maximisation of beneficial effects.

This Scoping Report identifies the impact pathways and key sensitive receptors that will be considered in the EIA and aims to provide a structure for consultation and content in the EIA that will support the licensing application for the Project. Within this Scoping Report several environmental and human receptors are identified, and the predicted impacts of the Marine Project on these receptors are considered. Receptors have been scoped in or out of this report through an analysis of available data for the Marine Project, using professional judgement and through applying lessons learned from previous Scoping Opinions for energy developments in the marine environment in Scotland.

1.2 Document Structure

The Scoping Report follows the structure outlined in Table 1-1 and sets out the chapters and approach relevant to each EIA topic.

Table 1-1 Scoping Report Document Structure

SECTION	TITLE	OVERVIEW
1	Introduction	Provides an introduction to the applicant and the Project, outlines the objective of the Scoping Report and the methodology used.
2	Approach to Scoping and EIA	Outlines the approach taken for Scoping and the methodology proposed for the EIA.
3	Stakeholder Engagement	Outlines stakeholder consultation conducted to date and the proposed approach to further consultation.
4	Legislation and Policy	Sets out the need for the Project and the relevant policy and legislative context.
5	Project Description	Provides a description of the key components of the Project.
6-7	Physical Environment Topics – specific EIA Scoping chapters (Marine physical and coastal processes; Water and sediment quality; sections on designated sites for the conservation of geomorphological features have been included in relevant subchapters)	Topic specific sections cover: • An outline of the baseline characterisation; • Scoping of impacts, including embedded mitigation; and • An outline of the proposed approach to the EIA.
8-11	Biological Environmental Topics – specific EIA Scoping chapters (Benthic ecology; Fish and shellfish ecology; Marine mammals and other Megafauna; Ornithology; sections on designated sites for the conservation of habitats/species have been included in relevant subchapters)	

SECTION	TITLE	OVERVIEW
12-15	Human Environment Topics – specific EIA Scoping chapters (Other sea-users including fisheries and aquaculture; Shipping and navigation; Cultural heritage and marine archaeology; Climate and carbon)	
16	Summary of Potential Impacts	Summarises potential impacts scoped in for assessment within the EIA
17	Outline Schedule of Mitigation	Summarises proposed embedded and secondary mitigation
18	Suggested Structure of the EIA Report	Outlines the proposed structure of the EIA Report.
19	Concluding Remarks	Summarises the approach taken to Scoping and the key findings of the Report.
20	References	Presents a comprehensive list of all references cited

2 APPROACH TO SCOPING AND EIA

The scope of the EIA Scoping Report and EIA Report will include both the construction and operation and maintenance phases of the Marine Project. As the Marine Project infrastructure is intended to stay in place indefinitely, no assessment of the decommissioning impacts will be provided. All process, mechanical, electrical, control and utilities systems of the Project are designed for a minimum lifetime of 20 years, whereas the buildings, civil, concrete and major steel structures will be designed for a minimum lifetime of 40 years. Statkraft will be applying for planning permission in perpetuity and intend to operate indefinitely, whereas the marine licence will only cover the construction phase of the Marine Project. The ammonia export vessels and their operation do not require a planning permission or a marine licence, but where aspects of vessel operation may cause impacts, these will be considered as part of this Scoping Report (and the subsequent EIA) to provide a holistic assessment of the proposed future state.

2.1.1 Project Design Envelope

The Project boundary is shown in Figure 5 1. The Marine Project boundary is defined as the MHWS line within the red line boundary area of the Project and extends to the construction area of the 160 metres jetty in Dales Voe and will be further refined as the Marine Project design is developed prior to submission of the marine licence application.

To assist with technical uncertainty in the licence application process it is common practice to define what has become known as a 'Rochdale Envelope'[1];. The principle of Rochdale Envelope permits the developer or applicant to provide broad or alternative project engineering and construction parameters, of which one, or a selection of the scenarios or parameters, will ultimately be constructed. The 'realistic worst case' scenario assumes that one or other of the parameters will have a more significant adverse effect than the alternative. Where a range is provided the most detrimental is assessed in each case.

The design that could result in the most significant impact may be different for each receptor type. Understanding the cause and effect specific to each receptor leads to the definition of the appropriate Rochdale parameter for that receptor and, therefore, identifies the 'realistic worst case'. Taking the 'realistic worst case' scenario, it can be assumed if no significant impact is demonstrated at the 'realistic worst case', then no significant impact is likely for any scenario.

2.1.2 Source-pathway-receptor methodology

Central to the assessment is the conceptual 'source-pathway-receptor' model. The 'source-pathway-receptor' model which defines those receptors considered to be at risk. Where there is no known 'pathway' then no impact is considered to occur. This highlights the event from which the effect arises (source), the potential receptor, and the

[1] *This is named after two legal cases relating to a proposed business park in Rochdale. The cases considered applications for outline planning consent in the context of preparing an EIA. The adoption of the Rochdale Envelope approach allows meaningful EIA to take place by defining a 'realistic worst case' scenario that decision makers can consider in determining the acceptability, or otherwise, of the environmental impacts of a project. As long as a project's technical and engineering parameters fall within the limits of the envelope and the EIA process has considered the impacts of that envelope and provides robust and justifiable conclusions, then flexibility within those parameters is deemed to be permissible within the terms of any consent granted, i.e., if consent is granted on the assessed maximum parameters of a development, any parameters equal or less than those assessed is permitted to be constructed.*

mechanism linking the effect and the receptor (pathway)[2]. This environmental impact chain model can be applied to local and distant impacts in the context of ongoing or background environmental changes. A range of 'sources' and 'pathways' can result in direct impacts on individual receptors, but also either indirectly or in conjunction with other impacts.

The activities related to the Marine Project occurring within the construction and operation and maintenance phases (i.e., the 'sources' of impacts) are described in Section 5. Environmental aspects related to specific receptor groups are then discussed on a topic by topic basis in Section 6 to Section 15 . For each environmental topic the baseline conditions are described from relevant publicly available data, scoping reports from other relevant projects and site-specific survey reports. Using expert professional opinion, potential impacts or effects which may occur during the construction and operational and maintenance phases of the Marine Project are identified and, where necessary, mitigation measures proposed to reduce or minimise effects or impacts[3] to the relevant receptor group.

Topic sections conclude by outlining proposed impacts to be scoped in and out of the EIA. In line with Institute of Environmental Management and Assessment (IEMA) guidance, topics will be proposed to be scoped in or scoped out of the EIA based on the credible potential for significant residual effects occurring after the implementation of mitigation (Institute of Environmental Management and Assessment (IEMA[4]) 2015, 2016, 2024). The summary of the topics scoped in or out is shown in Table 16-1.

Where a topic/receptor is proposed to be scoped out of the EIA on the basis of mitigation, that mitigation is clearly stated and included in the Schedule of Mitigation (SoM). The mitigation outlined in the initial SoM shall be transcribed into a Construction Environmental Management Plan (CEMP) that will be developed for the Project. Where a topic is proposed to be scoped into the EIA, consideration is also given to the proposed EIA methodology for each topic.

2.2 EIA Topics Covered by the Terrestrial EIA

As Statkraft's terrestrial programme for the Project is further advanced than the marine programme, the terrestrial EIA Scoping Report has been submitted to SIC for evaluation and adoption of the EIA Scoping Opinion under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. As Statkraft intends to submit a separate EIA Report for the planning authority, SIC, and to MD-LOT for the terrestrial and marine components, some overarching EIA topics covering both marine and terrestrial impacts will only be covered by one of the EIA Reports. As the majority of the potential impacts related to these topics will be a result of the terrestrial aspects of the Project, and any marine impacts are anticipated to be minimal, Statkraft intends to cover the following topics under the terrestrial EIA Scoping and EIA Report, and as such they are not considered further in this EIA Scoping Report[5]. The overarching Project topics that will be addressed in the terrestrial EIA Report are listed below:

[2] For example, an activity such as jetty construction (the source) could result in disturbed sediment being re-suspended into the water column. Tidal flow and currents (the pathway) could result in a receptor, such as a benthic organism, being smothered as the sediment resettles on the seabed (the impact). If no 'pathway' to a receptor exists, then the effect can be screened-out.

[3] For the purpose of this Scoping Report, the term 'impact' has been used to refer to the way in which an environmental resource/receptor is changed by the project proposal. 'Effect' is used to describe the consequence of the change to (or impact upon) an environmental resource/receptor.

[4] In 2025, IEMA rebranded to become the Institute of Sustainability and Environmental Professionals (ISEP).

[5] This approach has been discussed with MD-LOT during a meeting held on 14 January 2026.

- Seascape, Landscape and Visual Impact Assessment (SLVIA);
- Major Accidents and Disasters (MA&D);
- Socio-economics;
- Air Quality;
- Population and human health; and
- Disposal and Transport of Waste.

Furthermore, the following terrestrial topics will be covered by the terrestrial EIA Scoping Report and EIA Report:

- Onshore Ecology and Ornithology;
- Onshore Hydrology and Peat;
- Onshore Historic Environment;
- Onshore Traffic and Transport;
- Onshore Noise and Vibration;
- Onshore Water and Flood Risk; and
- Onshore Greenhouse Gases.

2.3 EIA Methodology

Once the Scoping Opinion has been adopted by MD-LOT, the studies required to assess impacts on the specific topics will be carried out for the preparation of the EIA Report. Statkraft intends to submit a separate EIA Report for the planning authority, SIC, and to MD-LOT for the terrestrial and marine components, respectively.

The EIA methodology will be conducted in a four-stage assessment summarised in the schematic diagram presented in Figure 2-1. The information and understanding attained from the assessment of the environmental baseline, updates to the project design, and stakeholder engagement will be applied through the assessment.

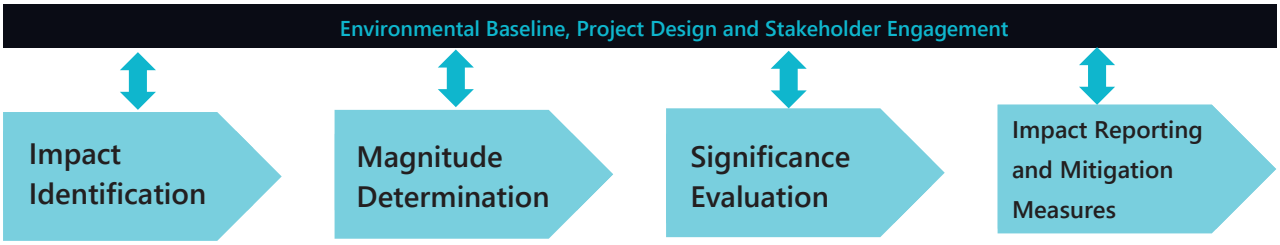

Figure 2-1 EIA Methodology Summary

Initially the impacts will be identified from the scoping process which will highlight the potentially significant impacts and effects, this will also take into consideration any secondary, indirect, cumulative, and/or transboundary effects. The second stage will be determining the magnitude of the identified impacts arising from the project activities. Determining this magnitude will take into account the potential impacts from the Project and the relevance to each receptor. The third stage will be evaluating the significance of the potential impact from the Project on the receptors. Stage four will be reporting the impacts and addressing any impacts which may require different or further mitigation measures. The evaluation will be standardised across the receptors using the significance matrix detailed in Table 2-1.

Table 2-1 EIA Methodology Significance Matrix

		MAGNITUDE OF IMPACT			
		Negligible	Low	Medium	High
Receptor sensitivity	Negligible	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Minor	Minor
	Medium	Negligible	Minor	Moderate	Moderate
	High	Negligible	Minor	Moderate	Major

2.4 Transboundary Effects

The impacts or zone of influence of the Project do not extend beyond the limits of Scottish territorial waters, and the Marine Project is not considered to lead to any transboundary effects. As there is no potential for transboundary impacts as a result of activities undertaken during the construction and operation and maintenance phases of the Marine Project, transboundary impacts have not been considered further within this Scoping Report.

2.5 Cumulative Effects

A Cumulative Effects Assessment (CEA) forms part of the EIA process. The EIA Regulations require that consideration is given to the potential impacts of the Project cumulatively with other plans and projects (developments) and activities within the marine environment which have the potential to result in a cumulative effect on a receptor or group.

The identification of cumulative projects adopts a staged approach. First, a 'long list' of cumulative projects will be collated using publicly accessible databases and in consultation with MD-LOT, based on defined areas of search specific to different types of plans, projects (developments) and activities. This long list will then be reduced to a 'short list' by taking receptor-specific potential pathways of impact (e.g. temporal and spatial overlap of impacts) into account through various 'screening tests'. Where plans, projects (developments) and activities identified in the long list pass these screening tests, they will be included within the short list of plans, projects (developments) and activities.

The EIA Report will consider projects which are defined as:

- Already constructed;
- Under construction;
- Permitted development(s), but not yet implemented;
- Submitted application(s) not yet determined; and,
- Plans and projects which are "reasonably foreseeable" (i.e. developments that are being planned).

3 STAKEHOLDER ENGAGEMENT

3.1 Consultation for marine EIA

Engagement with stakeholders is an important part of the development of any project; early and ongoing consultation is required throughout the lifecycle of the Project to allow for the integration of stakeholder feedback into the decision-making and design and environmental assessment process and for Statkraft to communicate progress.

Engagement with the statutory and non-statutory consultees, including members of the public, has already begun. Statkraft performed early project engagement with the public and relevant stakeholders in Shetland on the 19 and 20 November 2025.

On 14 January 2026 an introductory call was held between MD-LOT, Statkraft and Xodus. In the call an introduction to the Tagdale Green Ammonia Project was provided accompanied by an update on current programme, a summary of the work completed to date, a description of the marine works proposed, understanding of the permitting requirements for the marine works and identified key marine environmental sensitivities.

In addition to the Pre-application Consultation (PAC) process required for the planning permission, a marine PAC will also be required under the Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013. A summary of relevant consultation performed will be presented in the form of a PAC Report for submission as part of the marine licence application to MD-LOT. The PAC Report will also provide an audit trail of how the project has responded to stakeholder comments.

3.2 Consultation for terrestrial EIA

The terrestrial EIA Scoping Report (WSP, 2026) provides the following information in terms of consultation plans, engagement and feedback received so far split by EIA topic is presented below.

3.2.1 Landscape and visual impact assessment

Engagement with the Landscape Officer at SIC concluded with agreement on the scope of the SLVIA. This included agreement on the Zones of Theoretical Visibility (ZTV), viewpoint selection, their coverage and the extent of the study area, the methodology applied and the type of visualisations to be included.

3.2.2 Ecology/Ornithology

It is anticipated that, as a minimum, consultation with the following groups will be carried out:

- NatureScot;
- SIC;
- Royal Society for the Protection of Birds (RSPB) Scotland; and

- Scottish Environment Protection Agency (SEPA).

3.2.3 Ground conditions

A data request was made on 14 September 2025 to SIC requesting details of mineral sites and safeguarding areas, landfills (current and historical) and any potential sites defined as contaminated land. A response was received on 16 September 2025 signposting to the council's contaminated land inspection strategy. No significant changes in the area were known since issue of the strategy in 2010.

3.2.4 Traffic and transport

At a minimum, consultation will be undertaken with the SIC Roads team to discuss the access point with the A970 and the impacts of construction traffic on the local road network.

3.2.5 Air quality

Consultation will be undertaken with the Environmental Health Officer (EHO) at SIC in order to agree the scope of the air quality assessment methodology. Consultation will also be undertaken with NatureScot in order to agree the scope of the assessment of impacts on ecologically designated sites. Any additional consultation will be undertaken prior to the assessment with the relevant stakeholders as appropriate.

3.2.6 Water and flood risk

It has been identified that the main organisations that might hold views regarding the potential Water Environment effects of the Project include:

- SEPA;
- Scottish Government's Marine Directorate - Science, Evidence, Digital and Data team;
- SIC;
- Scottish Water; and,
- NatureScot.

Upon the completion and submission of the EIA Report, views and feedback would be sought from not just these organisations but all relevant parties and organisations. All consultation would be appreciated in order to ensure that the potential Water Environment effects of the Project are properly considered, and appropriate mitigation identified.

3.2.7 Major accidents and disasters

Consultation has not been undertaken to date to inform the proposed scope of the MA&D assessment. Consultation will be undertaken with the Health and Safety Executive (HSE) explosives inspectorate to confirm which site the explosives safeguarding zone is associated with and what potential impacts the presence of this safeguarding zone may have on the Project.

4 LEGISLATION AND POLICY

Construction of the proposed Project will fall under two main legislative acts, the Marine (Scotland) Act 2010 (marine licence) and the Town and Country Planning (Scotland) Act 1997 (planning permission). Further licences may also be required to support proposed works or survey activities performed below MHWS.

4.1 Legislative Requirements

4.1.1 Marine licensing

Part 4, Section 21 of the Marine (Scotland) Act 2010, lists the licensable marine activities. This confirms it is a licensable marine activity to construct, alter or improve any works within the Scottish marine area either, in or over the sea, or on or under the seabed. As the Marine Project includes the construction of a new jetty in the sea, a marine licence for the activity is required. Marine licences are granted by MD-LOT on behalf of the Scottish Ministers.

Through design[6], the current Marine Project does not include any other licensable marine activities beyond marine construction.

4.1.2 EIA

The EIA processes administered by the SIC and MD-LOT will be carried out under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 and Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, respectively.

As the new ammonia export jetty is capable of accommodating vessels of over 1,350 tonnes, the Project is considered to be a Schedule 1 Project under paragraph 8(2) of Schedule 1 of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations. . An EIA is therefore required for the Project.

4.1.3 PAC

In Scotland, certain activities taking place in the inshore region will require statutory public PAC to be carried out under the Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013, as mandated by the Marine (Scotland) Act 2010. Construction of any works (with the exception of a renewable energy structure) within the Scottish marine area either in or over the sea or on or under the seabed, where the total area in which such works are to be located exceeds 1000 m^2 in extent requires PAC, so these regulations are likely to apply to the Tagdale Project, should the jetty design exceed this threshold.

[6] *For example, the length of the jetty has been specifically designed to avoid the need for dredging and seabed preparation activities are being kept to a minimum.*

It is understood that terrestrial PAC under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 is also required for projects above MLWS and classified as 'Major Developments', such as the proposed Project.

4.1.4 Crown Estate Scotland Licence

Under the Scottish Crown Estate Act 2019, The Crown Estate Scotland (CES) owns the Scottish territorial seabed out to 12 Nautical Miles (NM). CES issues licences, leases, and consents for various marine works including marine construction works such as jetties. Authorisation from CES in the form of a Marine Works Licence may be required for the construction of Marine Project infrastructure.

4.1.5 SIC Marine Works Licence

Under the Zetland County Council Act (1974), any works in the sea, seabed or foreshore below MHWS and out to 12 NM requires a Works Licence issued by the SIC. Authorisation from SIC in the form of a Marine Works Licence will be required for the construction of Marine Project infrastructure.

4.1.6 Lerwick Port Authority Works Licence

The Marine Project site is located within Lerwick Port Authority's Statutory Harbour Authority (SHA) area. A Works Licence from the Lerwick Port Authority may be required for any construction works, and the requirements for this will be confirmed through consultation with the Port.

4.1.7 Nature Conservation Marine Protected Areas

Under Section 82 of the Marine (Scotland) Act 2010, Marine Scotland is required to consider whether a licensable marine activity is capable of affecting (other than insignificantly) a protected feature in a Nature Conservation Marine Protected Area (NCMPA), or any ecological or geomorphological process on which the conservation of any protected feature in an NCMPA is dependent. There are designated NCMPAs in Shetland and where potential impacts on these are identified in this Scoping Report, they will be considered as part of the Marine EIA.

4.1.8 Seal Haul-Out Sites

Seal haul-out sites, designated under The Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014 (as amended), are protected under Section 117 of the Marine (Scotland) Act 2010. There are no designated seal haul-outs or grey seal breeding sites that overlap with, or are located in, the vicinity of the Marine Project.

4.1.9 The Habitats and Birds Directive and Associated Regulations

The European Directive 92/43/EEC (the Habitats Directive) on the conservation of natural habitats and of wild fauna and flora has the primary aim of maintaining biodiversity within European Union (EU) Member States, and meet their obligations under the Bern Convention. The aim of the Habitats Directive is to maintain or restore natural habitats

and wild species listed on the Annexes at a favourable conservation status. This protection is granted through the designation of Special Areas of Conservation (SAC) and European Protected Species (EPS). The Habitats Directive is transposed into Scottish law within 12 NM by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland), known as the 'Habitats Regulations'.

SACs and Sites of Community Importance (SCIs) are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas (SPAs) are designated under the Wild Birds Directive in order to protect rare, vulnerable and migratory birds. These designated sites together create a European-wide 'Natura 2000' network of designated sites. Furthermore, Scottish Government (2025c) considers that listed Ramsar sites in Scotland designated under The International Convention on Wetlands of International Importance ('Ramsar Convention') should be treated as if they were European sites. Compliance with this policy means that any plan or project which could affect a Ramsar site will involve undertaking a HRA to determine whether the proposal is likely to have a significant effect on the notified natural features of the site.

Among other things, the Habitats Regulations define the process (Habitats Regulation Appraisal (HRA)) for the assessment of the implications of plans or projects on European sites. The HRA is a staged process, as follows:

- HRA Stage 1 – Screening for Likely Significant Effect (LSE): The first stage of the HRA process is to assess whether the plan or project will have an LSE on any European site either alone or in combination with any other plan or project. This is called the screening or LSE assessment. The screening assessment is only required if the plan or project is not directly connected with or necessary to the management of the European site concerned. If there is no LSE identified for any European site considered, the report will take the form of a No Significant Effects Report and HRA stages 2-3 will not be required.
- HRA Stage 2 – Appropriate Assessment (AA): If Stage 1 identifies an LSE of the plan or project on any European site, an assessment of the implications of the plan or project is needed in view of the European site(s) conservation objectives. Subject to HRA Stage 3, the competent authority may then only agree to the plan or project if it has been ascertained that it will not adversely affect the integrity of any European site alone, or in combination, with other plans or projects. If Stage 2 concludes that the plan or project will, or may, adversely affect the integrity of any European site then the plan or project requires Stage 3 assessment.
- HRA Stage 3 - HRA Stage 3 Derogation ('Stage 3 Derogation'): If the Stage 2 AA concludes that the plan or project will, or may, adversely affect the integrity of any European / Ramsar site then the plan or project may only proceed if the three HRA derogation tests are met. These are that (i) there are No Alternative Solutions ('NAS'); (ii) the plan or project must be carried out for Imperative Reasons of Overriding Public Interest ('IROPI'); and (iii) any necessary compensatory measures are taken to ensure that the overall coherence of the National Site Network (NSN) is protected.

Together SACs and SPAs, known as European Sites, formed the United Kingdom's 'NSN'[7].

The Habitats Regulations require that where a plan or project that is not directly connected with, or necessary to, the management of a European site, but is likely to have a significant effect, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's

[7] *The UK NSN is made up of SACs and SPAs designated at various points in time before exit day (i.e., UK sites that formed part of the EU's Natura 2000 network prior to exit day), and any sites designated under the Habitats Regulations after exit day.*

conservation objectives. Where an impact pathway has been identified in this EIA Scoping Report, a full consideration of the European Sites which fall within the relevant zone of influence will be considered within the Marine EIA.

In addition, the Habitats Regulations make it an offence to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, known as European Protected Species (EPS). Actions in relation to EPS can be made lawful through the granting of derogation licences (see Section 4.1.10).

4.1.10 EPS Licensing

EPS are animals and plants (species listed in Annex IV of the Habitats Directive) that are afforded protection under the Habitats Regulations. The marine EPS which could be impacted by the Marine Project and as such must be considered in the EIA scoping include all species of cetaceans (whales and dolphins) that are found in the vicinity of the Project. If any activity is likely to cause disturbance or injury to an EPS (cetacean), a derogation licence is required to undertake the activity legally. An EPS licence will only be granted if it can be demonstrated that:

- The Project has a licensable purpose, e.g. preserving public health or public safety or other IROPI including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- There are no satisfactory alternatives; and
- The proposed action must not be detrimental to the maintenance of the species at 'favourable conservation status'.

4.1.11 Basking Shark Licensing

Basking sharks (*Cetorhinus maximus*) are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (WCA 1981), which prohibits the killing, injuring, or taking by any method of those wild animals listed on Schedule 5. When basking sharks are present, licences to permit activities that will affect them can only be granted when the relevant tests are met. It is however not anticipated that a basking shark derogation licence is required for the Marine Project as basking sharks are rarely present in Shetland Island waters.

4.1.12 Water Framework Directive

The Water Framework Directive (WFD) (Directive 2000/60/EC of the European Parliament) is transposed into Scottish law through the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act). The directive aims to achieve a 'good' quality status for all rivers, lochs, transitional waters (estuaries), coastal waters, groundwater and groundwater dependant wetlands. As such, the main aims of the WFD are to:

- Prevent deterioration and enhance the status of aquatic ecosystems, including ground water;
- Promote sustainable water use;
- Reduce pollution; and,
- Contribute to the mitigation of floods and droughts.

The WFD objectives are to ensure that any Project will not cause or contribute to the deterioration of the current status of the water body, or jeopardise the water body achieving 'good' status. The following key receptors which contribute to the status of a waterbody were considered as part of the WFD assessment:

- Hydromorphology;
- Biology – sensitive habitats and species;
- Water quality;
- Protected areas; and
- Invasive Non-Native Species (INNS).

4.2 Policy Context

4.2.1 UK Marine Policy Statement (MPS)

The UK MPS sets out a single, UK-wide framework for how the seas should be managed, guiding all marine planning and licensing decisions across each UK Administration. The MPS applies to all UK waters and provides policy context for the assurance of consistency in marine planning across the UK marine area, underpinning which national and sub-national marine plans are developed, implemented, monitored and amended (UK Government, 2011). In Scotland, this is through Scotland's National Marine Plan (NMP) (see Section 3.2.2). All national and sub-national marine plans must be developed in accordance with the UK MPS.

4.2.2 Scotland's NMP

The Scottish Government published Scotland's NMP in 2015[8], as required by the Marine (Scotland) Act 2010. The NMP sets out the Scottish Minister's policies for the sustainable development of Scotland's seas. The plan provides General Planning Principles (GPPs) and sector-specific policies. As the Project is located within the Scottish inshore waters (out to 12 NM), the EIA must consider the NMP policies. The relevant policies are considered for each topic chapter of this Scoping Report.

4.2.3 Shetland Islands Regional Marine Plan

Regional marine plans are prepared by Marine Planning Partnerships (MPPs) representing the economic, community, environmental and recreational interests within a local marine region as required under the Marine (Scotland) Act 2010. MPPs are established to enable local ownership of policy development and decision making taking account of local circumstances.

The Shetland Islands Regional Marine Plan was published in 2025. The overarching objective of the Shetland Islands Regional Marine Plan is to ensure the sustainable development, protection, and enhancement of the Shetland Marine Region, whilst accommodating the mitigation of, and adaptation to, climate change (SIC, 2025). The relevant policies are considered for each topic chapter of this Scoping Report.

[8] *Scotland's NMP 2 is currently under preparation by the Scottish Government. The Project team will continue to monitor the adoption of this plan, and consider any new or changed policies once the plan has been published if within the timeline of the application.*

4.2.4 Energy and Climate Change

The Tagdale Green Ammonia Project uses renewable energy to produce green hydrogen, which is then converted to green ammonia. Green ammonia is needed as a zero-carbon solution to decarbonise heavy industries, serving as a sustainable fertiliser, chemical production, a clean fuel for shipping and transport, and a more efficient way to store and transport renewable hydrogen. This supports efforts to tackle climate change by replacing fossil fuels in "hard-to-abate" sectors like agriculture, maritime, and energy storage. Developing the green hydrogen and ammonia industries enables the UK, Scotland and Shetland Islands to reduce the greenhouse gas emissions from these industries, contributing to the goals set out in the policies below.

Kyoto Protocol to the United Nations Framework Convention on Climate Change

The UK is a signatory to the Kyoto Protocol which commits state parties to reduce greenhouse gas emissions, which came into effect in 2005. Its commitments were transposed into UK law by the Climate Change Act 2008, which requires the net UK carbon account for the year 2050 to be 80% lower than the 1990 baseline.

European Union Renewable Energy Directive

To maintain the EU as a global leader in renewables the Revised Renewable Energy Directive (2018/2001/EU) entered into force in 2018. This, in turn, helps the EU to meet its emissions reduction commitments under the Paris Agreement. The revised Renewable Energy Directive set the following targets:

- A minimum of 32% share of renewable energy consumption within the EU; and
- Member States to commit to the renewable energy consumption target as part of integrated national energy and climate plans, pursuant to Regulation (EU) 2018/1999 of the European Parliament and of the Council.

Since formally leaving the EU, the UK Government has committed to implement international environmental obligations in accordance with the EU (Withdrawal) Act 2018 and to maintain environmental commitments and legislation already made. On this basis, the existing EU renewable energy targets for the UK, including the EU Renewable Energy Directive 2009/28/EC remain applicable.

UK Hydrogen Strategy

The UK Hydrogen Strategy takes a holistic approach to developing a thriving UK hydrogen sector. It sets out what needs to happen to enable the production, distribution, storage and use of hydrogen and the steps necessary to secure economic opportunities for industrial heartlands across the UK. The UK Hydrogen Strategy sets out how the UK will deliver its 5 GW production ambition by 2030 and position hydrogen to help meet the UK's Sixth Carbon Budget and net zero commitments.

Climate Change Act

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets commitments for Scotland to reach Net Zero by 2045.

The Scottish Energy Strategy: The Future of Energy in Scotland

This Strategy sets out the Scottish Government 2050 vision for energy in Scotland. There are six visions for 2050, one of which includes renewable and low carbon solutions, specifically championing and exploring Scotland's huge renewable energy resources and ability to support energy targets.

Scotland's Emission Reduction Targets

Scotland has its own targets to reduce greenhouse gas emissions, which are set out in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. This Act aims to ensure Scotland contributes appropriately to the world's efforts to deliver on the Paris Agreement, reached at the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change. The Emissions Reduction Targets includes a reduction of all greenhouse gases to net-zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030 and 90% by 2040.

Scottish Government's Hydrogen Action Plan

The Hydrogen Action Plan was published in December 2022 and sets out the actions that will be taken between 2023 and 2027 to support the development of a hydrogen economy to further efforts to reduce greenhouse gas emissions from Scotland's energy system, while ensuring a just transition.

5 PROJECT DESCRIPTION

5.1 Project location

The Project is located in the Dales Voe sea loch to the south of the Dales Voe decommissioning base. The site is located approximately 3.5 km to the north of the capital of Shetland, Lerwick, and close to the industrial area of Gremista (approximately 2 km away by land). Other settlements nearby the Site in Shetland's Central mainland include Gott (2 km to the west, located across Dales Voe), Holmsgarth (2.2 km to the south) and Veensgarth (2.4 km to the southwest). The Dales Voe sea loch is about 5 km in length and covers an area of approximately 3.4 km^2 (SEPA, 2025). Where the Marine Project is located, the width of the loch is approximately 480 metres. Dales Voe is orientated broadly southwest to northeast, between Kebister Ness to the south and Fora Ness to the north. Dales Voe is closed at its southern end which is located <1 km away from the red line boundary, and connected to the open ocean (North Sea) at its northern end. The Marine Project site is located within Lerwick Port Authority's SHA area. The project location and layout, overlain a google earth images is presented in Figure 5 1.

It is considered that the site is favourably positioned for the development of a local green hydrogen and green ammonia industry, this is because:

- It is resource rich with significant renewable projects in the pipeline with constrained access to grid. This will alleviate significant grid infrastructure investment circa (£2 billion) as the renewable energy demand is utilised in Shetland;
- It has established oil and gas infrastructure which could be repurposed as identified by the Net Zero Technology Centre report Hydrogen Backbone Link: Connecting Scotland to Europe;
- It has a knowledgeable and skilled workforce in the energy and marine sectors that are estimated to be around 1,000 plus individuals;
- It has forward looking political leadership;
- It is an existing industry with a need to transition to low carbon sources, which would provide a domestic offtake within Scotland and wider UK for the initial phases of development of hydrogen derived fuels; and
- Ideally located for international collaboration in the development of our shared hydrogen economy to fully explore our hydrogen / ammonia export potential

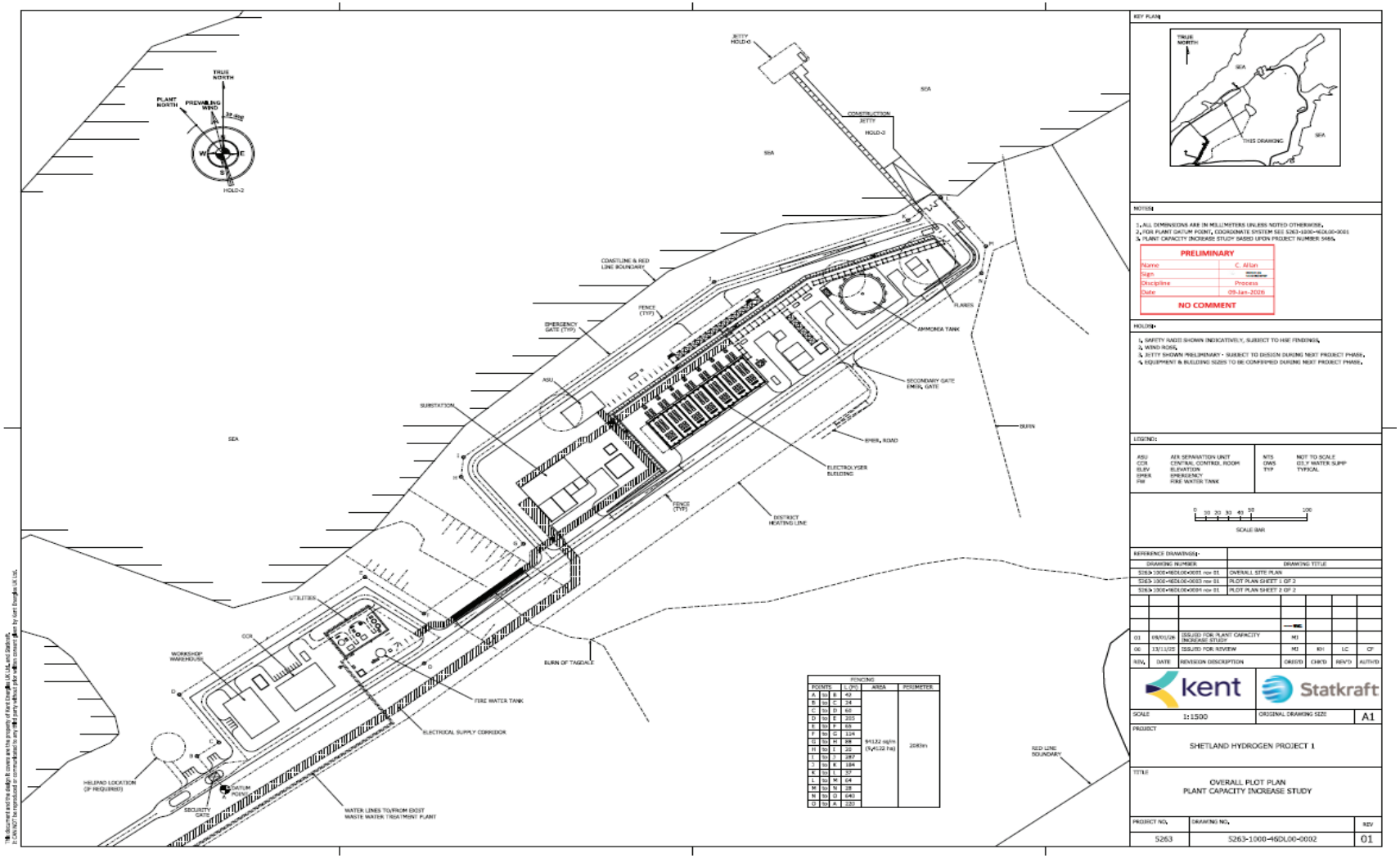

Figure 5-1 Project location and layout. Source: Kent.

A simplified version of the overall Tagdale Green Ammonia Project's ammonia production process is presented in the flow diagram in Figure 5-2, and are described briefly below.

Once constructed, the Tagdale facility will comprise of up to 70 MW electrolyser units (approximately 80 MW total energy requirement). The feed streams to the process are air, water and power. The process uses electrolysis to produce hydrogen from the water feed. Atmospheric air is fed to an air separation unit to produce nitrogen. The hydrogen and nitrogen are then reacted together within the Haber-Bosch process which produces ammonia. Within the ammonia synthesis system, heat may be recovered via a steam production system. The gaseous ammonia produced is then cooled to create a liquid product, which is routed to a storage tank[9] at the jetty site. The Ammonia Storage Tank shall be sized to accommodate a ship offtake capacity of 15,000 t (~22,100 m^3), with allowance for buffer and vapour space as required. The produced ammonia will be periodically transferred from the Ammonia Storage Tank to the new build jetty for export by ship via the export line and loading arm (Kent, 2025a). The production facility will produce up to 185 tonnes of green ammonia per day (WSP, 2026). It is estimated that the ammonia offloading operation will occur every 15 weeks and take approximately 24 hours (20 hours pumping) per offload.

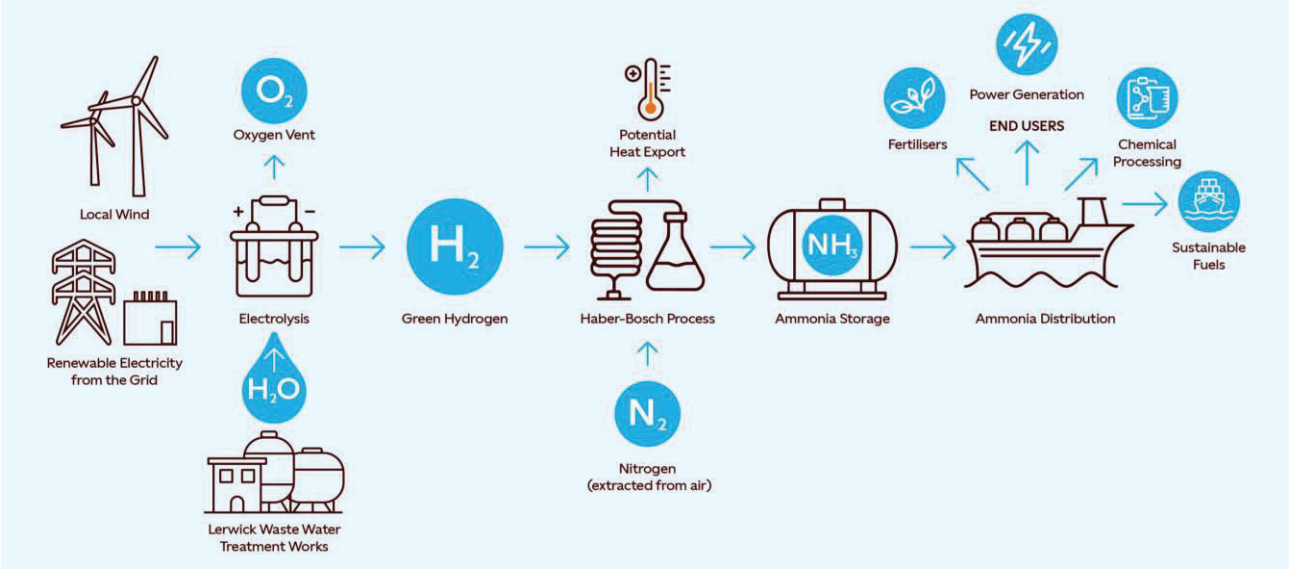

Figure 5-2 Ammonia production and transportation process

The water supply for the hydrogen production will be sourced from the Lerwick's Waste Water Treatment Works (WWTW), located approximately 1.5 km to the east of the site. An air separation unit will supply nitrogen to the Project, which will be extracted from the atmosphere. Due to the nature of the works proposed, the site will be required to operate on a 24/7 basis throughout the year. Lighting will be needed for operational activities during the hours of darkness and a detailed lighting scheme will be developed to ensure that this is controlled and managed to the minimum required for operational safety. The Project also proposes to capture the heat from the ammonia

[9] *Ammonia produced in the Ammonia Synthesis Plant will be stored in the atmospheric Ammonia Storage Tank located at the new jetty area. The Boil Off Gas (BOG) from the tank will be managed by the BOG Package where it is reliquefied and returned to the tank.*

synthesis process, with the intention of utilising this heat to support the expansion of the Lerwick District Heating Scheme.

5.2 Marine Project Description

The Marine Project will consist of the construction of a new 160 metre ammonia export jetty, orientated broadly perpendicular to the coastline with dolphin moorings at the seaward end. The jetty will be located near the north-east boundary of the site on the coastal side (Figure 5 1). An indicative design of a similar jetty to what is proposed for the Marine Project is shown in Figure 5-4.

The ammonia will be transported via an above ground pipeline to the offloading site, which is located below MHWS adjacent to the main production site. The pipe used to transfer ammonia will run along the length of the jetty to a loading arm. The loading arm will be connected to the ammonia transport vessel during transfer. The dolphin mooring setup provides fendering and mooring points for the vessels. It is proposed that the jetty will be sized to accommodate a ship offtake capacity of 15,000 t (~22,100 m^3), with allowance for buffer and vapour space as required.

The jetty width (breadth) will be up to 8 metres. This assumes 5 metres breadth for the access way and 3 metres breadth for the pipelines to run alongside. The height of the jetty above the seabed has been estimated to ensure sufficient clearance from the water surface to the underside of the jetty structure. The water depth, Highest Astronomical Tide (HAT) and approximate values for storm surge and clearance have been summed to estimate a jetty height of 18.3 metres from the seabed to the underside of the jetty at the deepest point (Figure 5-3). Due to the water depth at the location of the jetty, no dredging is proposed. The overall marine footprint and working area is not yet known.

Dolphin moorings are considered to be the most suitable arrangement for securing vessels at the jetty. The mooring dolphins only have mooring points and are set inland of the breasting dolphins to reduce the possibility of the ship impacting them. Mooring dolphins will be arranged to facilitate breast and sprint mooring lines. The jetty shall be fitted with navigational signage and lighting which adheres to local and national regulations. In addition, the jetty shall have sufficient lighting to illuminate the offloading operation to allow continuous observation of the operation.

The studies undertaken thus far have not included consideration of geotechnical or structural design of the connection of the jetty to the seabed. It has been assumed that steel piles would be suitable which would typically be installed by a crane on a floating pontoon/barge, but at this stage it is not known whether rotary or impact piling will be used, and how many piles are required. Requirements for other seabed preparations such as boulder removal for marine civil works have not been considered at this design stage. There is no requirement for direct water extraction from, or proposed discharge to, the marine environment from the Tagdale facility. Any discharges will be made through the Lerwick WWTW.

During construction, it is proposed to utilise the existing Dales Voe Base for delivery of construction materials, but the number of construction and material transport vessels is currently not known. Subject to granting of the required permits, terrestrial and marine construction works will commence in late 2027 and last for approximately two years. The exact duration of the marine construction works is not yet known. Early plant operations are planned for late 2029, with first ammonia export from the jetty taking place in early 2030.

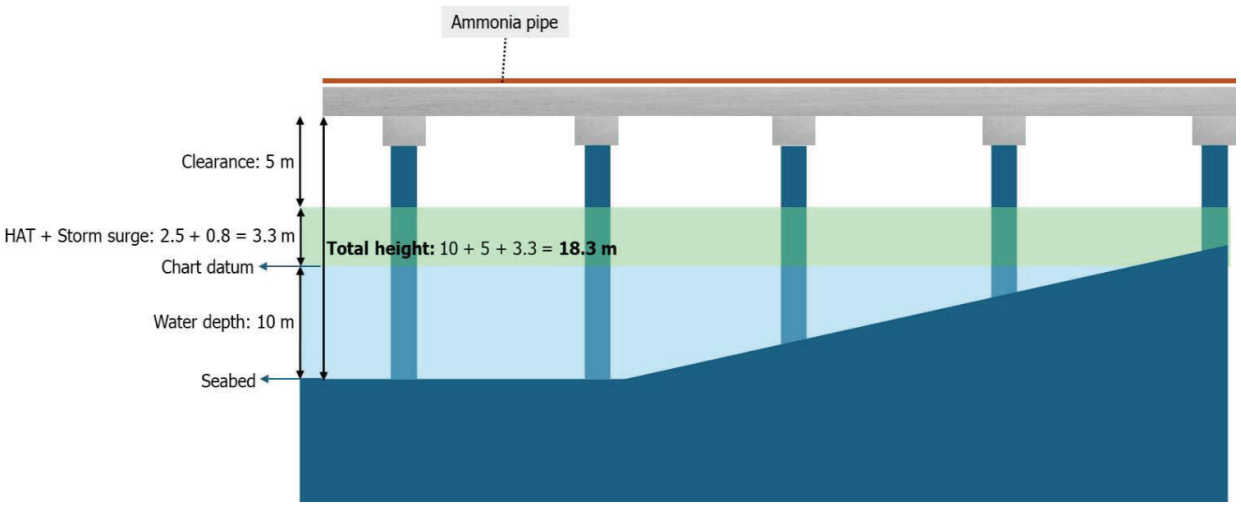

Figure 5-3 Diagram showing the approximate calculation of jetty height relative to chart datum and the seabed. Source: Kent (2025c)

Figure 5-4 Labelled aerial photo of Sullom Voe Oil Terminal showing a similar jetty and typical jetty components. Source: Kent (2025c)

5.3 Operation and Maintenance

5.3.1 Project lifetime and operation

All process, mechanical, electrical, control and utilities systems shall be designed for a minimum lifetime of 20 years. Buildings, civil, concrete, and major steel structures shall be designed for a minimum lifetime of 40 years.

The Project will produce up to 185 tonnes of ammonia per day. It is estimated that the ammonia offloading operation will occur every 15 weeks and take approximately 24 hours (20 hours pumping) per offload, and one vessel per offload will be used.

It is currently assumed that the jetty will only be used for offloading, though future discussions regarding construction requirements could alter the jetty requirements. For instance, if large packages will be transported by sea to the production site for construction and/or ongoing part replacement or necessary maintenance activities.

5.3.2 Maintenance schedule and techniques

The different components of the jetty and vessel mooring system will be subject to a range of maintenance schedules and techniques: The following are estimates of required inspections:

Per use/daily inspections:

- Visual checks for damage to jetty from vessel impacts and vice versa;
- Visual checks for any general wear and tear, e.g. to safety ladders, handrails, grating etc.;
- Visual checks of mooring bollards, fenders, and winches; and
- Any debris/build-up on the jetty which could be a slip/trip hazard.

Annual inspections:

- The underwater structure will be subject to a regular inspection schedule which could include visual surveys, underwater surveys and/or non-destructive testing. Underwater surveys could require divers or unmanned underwater vehicles to look for damage, corrosion, scour etc.;
- The berth and approaching channels will be checked to ensure adequate depth is maintained; and
- Professional servicing of individual components to ensure regulatory compliance. This might apply to fire extinguishers, lifebelts, offloading arms or mooring components for instance.

5.4 Decommissioning

As described in Section 5.3.1, the designed lifetime of the Marine Project is a minimum of 40 years. As the Marine Project infrastructure is intended to stay in place indefinitely, no assessment of the decommissioning impacts has been provided and it is proposed to scope this phase out of the EIA. Statkraft however, will be applying for planning permission in perpetuity and intend to operate indefinitely, whereas the marine licence will only cover the construction and Operation and Maintenance phase of the Marine Project.

6 MARINE PHYSICAL AND COASTAL PROCESSES

6.1 Introduction

This chapter provides an overview of the sensitivities associated with the hydrodynamic, sedimentological, geological, bathymetric and geomorphological receptors of the Marine Project. An overview of the potential impacts of the Marine Project on the marine physical environment, including during the construction and operation and maintenance phase, are also discussed.

Within this chapter, marine physical and coastal processes is a collective term for the following:

- Hydrodynamic regime comprising water levels and currents;
- Waves (and winds);
- Water column stratification and frontal systems;
- Sediments and geology (including seabed sediment distribution and sediment transport);
- Seabed morphology; and,
- Coastal morphology.

In addition to the above, the chapter also considers Designated Sites and interest features that have the potential to interact with the Project.

In most cases marine physical processes are not in themselves receptors but pathways for impacts to other potential receptors, including physical, ecological and human receptors. As pathways, marine physical processes have the potential to lead to changes in associated receptors, including:

- Water and sediment quality (Section 7);
- Benthic ecology (Section 8);
- Fish and shellfish ecology (Section 9);
- Marine mammals (Section 10);
- Ornithology (Section 11);
- Other users of the marine environment (Section 12);
- Shipping and navigation (Section 13);
- Cultural heritage and marine archaeology and (Section 14).

6.2 Legislation, Policy and Guidance

In addition to the relevant policy and legislation described in Section 4, the following guidance will be taken into consideration as part of the scoping of potential impacts on the marine physical processes within the Project.

No specific legislative controls exist in Scotland for the marine physical environment impact assessment. There are however relevant policies that consider properties of the marine physical environment and best practice guidance on completing assessments, which are summarised below.

6.2.1 Policy and legislation

- Scotland's National Marine Plan. General Policy 8. The Scottish Government, 2015.
    - "Coastal process and flooding: Developments and activities in the marine environment should be resilient to coastal change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding."
- Shetland Islands Regional Marine Plan MP GEOD1: Safeguarding Marine Geodiversity.
    - "Proposals for marine development and use should consider potential impacts on geodiversity and appropriate measures to protect or enhance marine and coastal geological and geomorphological resources and sites. This includes the protected geological features of Sites of Special Scientific Interest (SSSI) and MPAs, Geological Conservation Review sites, and Geosites identified by Geopark Shetland for their educational or research value. Where proposals would have unavoidable adverse effects on marine geodiversity, applicants should consider recording the affected geodiversity and identifying mitigation measures to reduce marine geodiversity loss."
- WFD (Directive 2000/60/EC of the European Parliament). The WFD objectives are to ensure that any Project will not cause or contribute to the deterioration of the current status of the water body, or jeopardise the water body achieving good status.

6.2.2 Guidance

- Advice to Inform Development of Guidance on Marine, Coastal and Estuarine Physical Processes Numerical Modelling Assessments. Report No 208. NRW, 2017; and
- Guidance Note. Marine Physical Processes Guidance to inform Environmental Impact Assessment (EIA). GN041. NRW, 2020.
- Metocean Procedures Guide for Offshore Renewables (IMarEST, 2024): Guidance to support metocean characterisation data acquisition and assessments to inform developments.
- Guidance on Best Practice for Marine and Coastal Physical Processes Baseline Survey and Monitoring Requirements to Inform EIA of Major Development Projects. Report No 243 (Brooks *et al.*, 2018): Sets out best practice for baseline data needed to inform marine and coastal processes impact assessments including describing the appropriate approach to the acquisition and interpretation of relevant survey data
- Guidelines for Data Acquisition to Support Marine Environmental Assessments of Offshore Renewable Energy Projects (Cefas, 2012): These guidelines assist in the design, review and implementation of environmental data collection and analytical activities associated with all phases of offshore renewable energy developments. There is a specific section covering 'physical and sedimentary process studies', setting out guidance on data acquisition and adequacy, survey design and impact assessment techniques (including modelling).
- Guidelines in the use of metocean data through the lifecycle of a marine renewables development (CIRIA, 2008): This guide has been developed to identify and recommend on the uses of metocean data through the life cycle of a marine renewable energy development. It includes a review of metocean data types, data sources and identifies the importance of good data management.

6.3 Study Area

Dales Voe lies in Shetland, which is classified under Coastal Cell 11 in Scotland's National Coastal Change Assessment (NCCA). The study area applied for this topic is a 5 km buffer around the Project, based on the spring tidal excursion ellipse. This is considered to provide a sufficient worst case area of impact from the Marine Project reflecting the maximum excursion distance of suspended sediments transported under the forcing of tidal currents.

6.4 Data and Information Sources

Publicly available data used to inform this Scoping Assessment are presented in Table 6-1.

Table 6-1 Summary of key sources of information for physical environment receptors

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Bathymetry, Geology and Seabed Sediment			
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
Dales Voe Ultra-Deep-Water Quay Environmental Impact Assessment (EIA) Scoping Report	https://marine.gov.scot/sites/default/files/dales_voe_ultra-deep-water_quay_eia_scoping_report_redacted.pdf	2024	Envirocentre
British Geological Survey (BGS) Offshore GeoIndex Map	http://mapapps2.bgs.ac.uk/geoindex_offshore/home.html	2023	BGS
Strategic Environmental Assessment (SEA) Data Portal	https://webapps.bgs.ac.uk/data/sea/app/search	2021	BGS
UK Hydrodynamic Office (UKHO) Admiralty Chart data & UKHO INSPIRE bathymetric data	https://datahub.admiralty.co.uk/portal/apps/webappviewer/index.html	2023	UKHO
EMODnet Bathymetry	https://www.emodnet-bathymetry.eu/	2023	EMODnet
Metocean (Water Levels, Currents, Waves) and Water Column Properties			
National Tidal and Sea Level Facility (NTSLF)- Observational Water Level Records	https://www.ntslf.org/	2020	NTSLF
UK Offshore Energy Strategic Environmental Assessment 3 (OESEA3). Appendix 1D – Water Environment (Regional Sea 8)	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/504541/OESEA3_A1d_Water_environment.pdf	2016	Department of Energy and Climate Change (DECC)
UK Offshore Energy Strategic Environmental Assessment 4	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data	2022c	Department for Business, Energy and

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
(OESEA4). Appendix 1D – Water Environment	/file/1061672/Appendix_1d_-_Water_environment.pdf		Industrial Strategy (BEIS)
Admiralty Total Tide (ATT) tidal prediction software	UKHO Admiralty Maritime Data Solutions. https://www.admiralty.co.uk/publications/admiralty-digital-publications/admiralty-totaltide	2023	UKHO
Atlas of UK Marine Renewable Energy, Interactive Map	https://www.renewables-atlas.info/explore-the-atlas/	2018a	ABPmer
SEASTATES Metocean Data and Statistics Interactive Map	https://www.seastates.net/explore-data/	2018b	ABPmer
Centre for Environment, Fisheries, and Aquaculture Science (Cefas) WaveNet	https://wavenet.cefas.co.uk/map	2023	CEFAS
British Oceanographic Data Centre (BODC) data Centre	https://www.bodc.ac.uk/data/	2022	BODC
UK Climate Projections (UKCP) 18	https://www.metoffice.gov.uk/research/approach/collaboration/ukcp	2018	Met Office
Scottish Shelf Waters Reanalysis Service	https://tinyurl.com/SSW-Reanalysis	2020	Marine Scotland
CEFAS Suspended Sediment Climatologies around the UK (Monthly average non-algal Suspended Particulate Matter concentrations on the UK shelf waters)	CEFAS_2016_Suspended_Sediment_Climatologies_around_the_UK.pdf (publishing.service.gov.uk) http://data.cefas.co.uk/#/View/18133	2016	CEFAS
Climatology of Surface and Near-bed Temperature and Salinity on the North-West European Continental Shelf for 1971–2000 (2009)	https://data.marine.gov.scot/sites/default/files//berx-hughes_2009.pdf	2009	Berx and Hughes
Coastal Properties			
EMODnet Coastal Type	https://emodnet.ec.europa.eu/geoviewer/	2021	EMODnet
Dynamic Coast 2	https://www.dynamiccoast.com/	2020	CREW
General Information			
Sectoral Marine Plan: Regional Local Guidance	https://www.gov.scot/publications/sectoral-marine-plan-regional-locational-guidance/documents/	2020	Scottish Government

6.5 Baseline Environment

6.5.1 Bathymetry and seabed sediments

Publicly available bathymetry data indicates that water depths of 3-7 m are found closer to the shore where the export jetty will be located (Envirocentre, 2024; Scottish Government, 2025a).

Publicly available data shows that subtidal benthic substrates are diverse, with the southern areas of the Dales Voe comprising of mixed sediments, silt and clay with flints; and the northern areas of Dales Voe comprising sand and muddy sand, silt, clay with flints and coarse sediments (Scottish Government, 2025a). The EIA Scoping Report for the for the nearby Dales Voe Ultra-Deep-Water Quay mention that sublittoral substrates comprise terraced bedrock with vertical faces down to 10 to 15 m. Below this, soft sediments predominate. In the outer parts of the Dales Voe below 10 m, there is fine sand grading into stable sublittoral mud at 20 m. Deeper still, east of Breiwick, the sediment is shell sand with gravel (Envirocentre, 2024). The outer more exposed areas in the intertidal zone are comprised of rocky substrates (cliffs, terraced bedrock, boulders with areas of cobble and pebble) (Envirocentre, 2024; Scottish Government, 2025a). In the more sheltered intertidal areas there are boulders, shingle and mixed muddy sediments (Envirocentre, 2024; Scottish Government, 2025a). There is an extensive area of sediment and saltmarsh at the head of the loch with poorly sorted mud in the shelter behind a shingle spit but with coarser poorly sorted sediment outside. A burn discharges through this area (Envirocentre, 2024).

The main European Nature Information System (EUNIS) habitats in Dales Voe are infralittoral coarse sediment (A5.1), followed by Atlantic and Mediterranean high energy infralittoral rock (A3.1) and Atlantic and Mediterranean low energy infralittoral rock (A3.3) (Figure 6-1). This publicly available information is supported to some extent by the results of grab samples analyses in Dales Voe. Specifically, the EIA Scoping Report for the Dales Voe Ultra-Deep-Water Quay mention that the sediment samples were described as being a mixture of fine light brown sand with clay, coarse sand from shells and a mixture of possible coral and shell sand. Particle-Size Distribution (PSD) analysis described them as fine sand, medium sand, coarse sand and coarse shelly sand (Envirocentre, 2024).

6.5.2 Currents, waves, tides, temperature and salinity

Intensified tidal currents exist in the wider Shetland Islands where topography constrains the flow between the various islands. Tidal currents in Dales Voe are however likely low in magnitude due to the limited tidal range of 1.7 m (mean springs) (JNCC, 1999; Scottish Government, 2025a). The residual circulation close to the Shetland Islands is clockwise, with circulation within loch likely to be weak with limited exchange with the Atlantic (Scottish Government, 2020).

Publicly available data on waves is relatively limited in the area of proposed works. Dales Voe is relatively sheltered from wave exposure due its orientation to prevailing Atlantic wave exposures. Wave exposure increases at the entrance to the Voe, but penetration is limited to waves approaching the Voe from specific directions only, meaning that within the Voe conditions are sheltered. Closer to the northern limit of the area of Marine Project shows 1.51 - 1.80 m of annual mean significant wave height and 12.1 – 18 kW/m of annual mean wave power (Scottish Government, 2025a). Based on the Wave Exposure Index (WEI) the southern and central parts of the area of the proposed works are more sheltered (WEI ranging from 1.7 to 2.17) while northern parts are relatively more exposed (WEI up to 3.57) (Scottish Government, 2025a). According to the scale of WEI in Scottish Government (2025a) values

around 1.7 are associated with 'more sheltered' conditions while values around 4.5 are associated with 'more exposed' conditions. Based on the foregoing information, the wave regime can be characterised as dominantly comprising local wind driven waves.

Publicly available data on temperature is relatively limited in the area of the Marine Project but for areas closer to the northern limit of the area of the proposed works mentions that annual mean surface temperature is around 9.5°C and annual mean near-bed temperature is approximately 9°C (Scottish Government, 2025a). The sea surface temperature in the Shetland Islands ranges from 7.6 to 13.6°C (Scottish Government, 2020). Publicly available data on salinity is also relatively limited in the area of the proposed works. The Scotland's Marine Assessment (2020) mentions that the Shetland Isles have the highest average surface salinity at 35.23 practical salinity units (psu), resulting from the high saline waters of the North Atlantic flowing along the edge of the Scottish Continental Shelf, coupled with very little freshwater input (Scottish Government, 2020). Due to this, stratification is likely weak within the Voe.

6.5.3 Designated Sites

The review of the publicly available data has shown no sites designated for geomorphological features within a buffer zone of 5 km. This buffer zone is based on the maximum spring tidal excursion ellipse in the area.

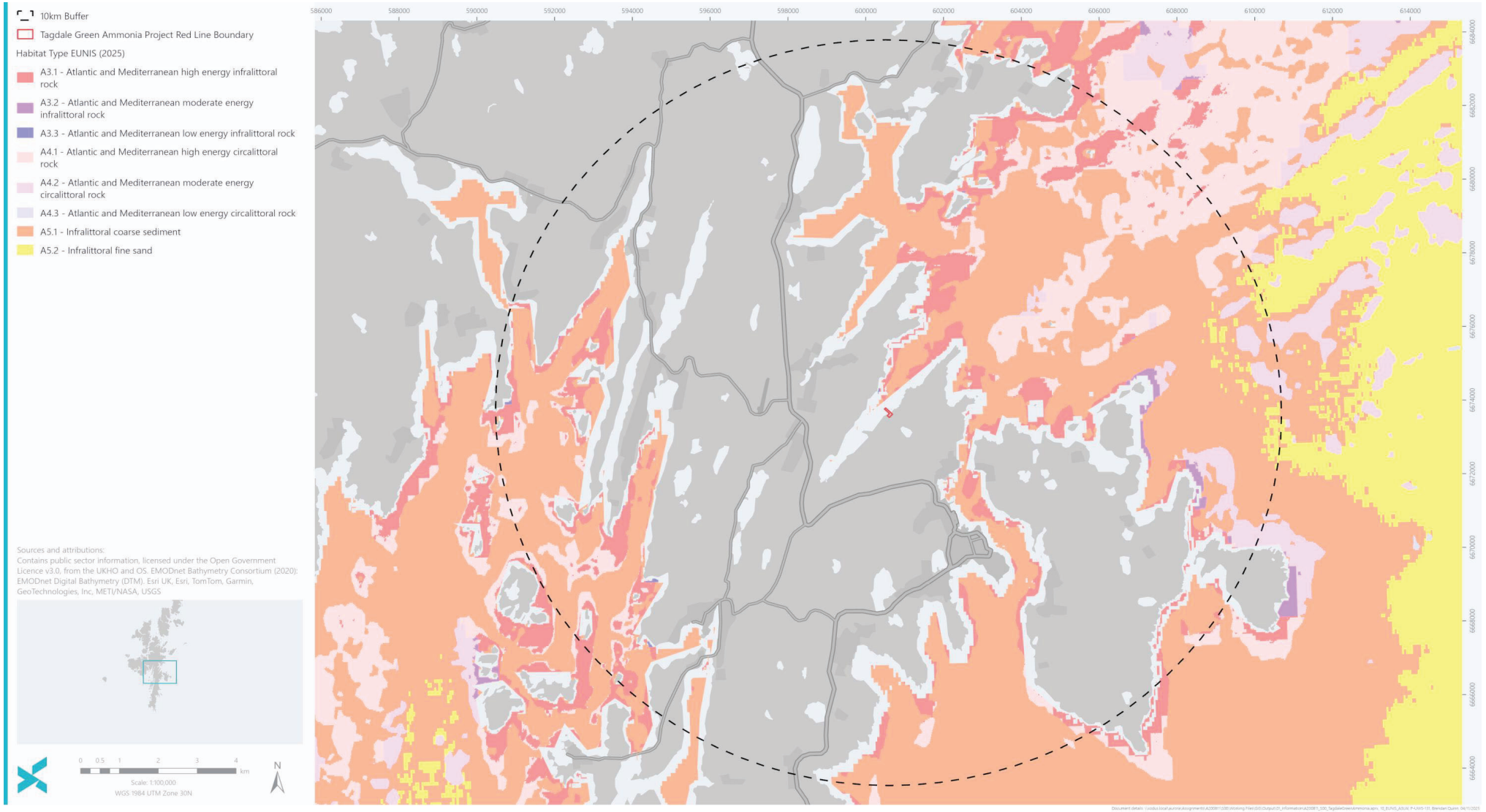

Figure 6-1 EUNIS habitat types within a radius of 10 km from the Project area..

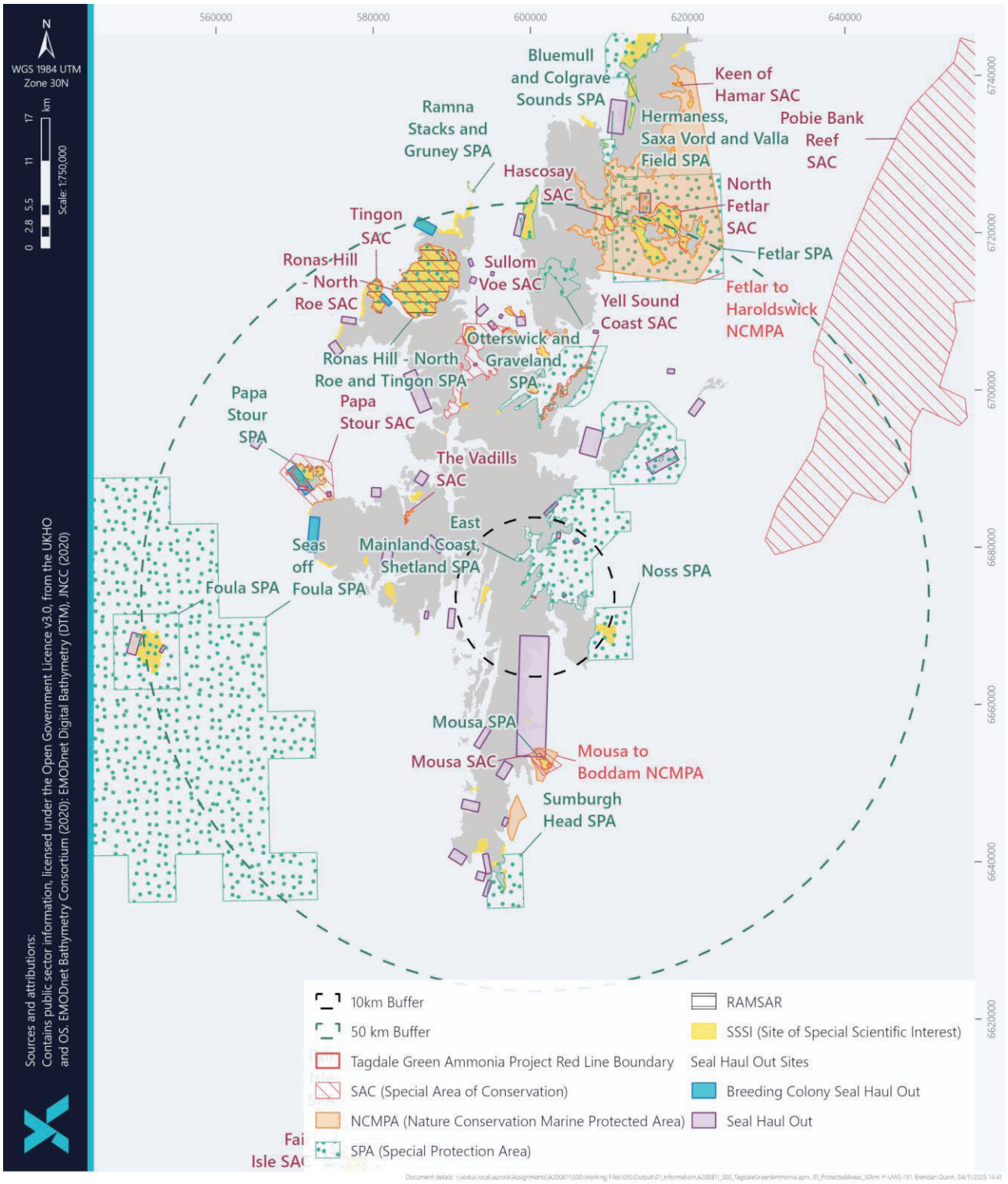

Figure 6-2 Designated sites and seal haul-out sites within a radius of 50 km of the Project.

6.6 Embedded Mitigation Proposed

Prior to installation a scour assessment will be completed to determine the need for protection, and if required, the protection will be installed at construction, thereby mitigating the potential development of scour. No further relevant embedded mitigation is proposed.

6.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on Physical and Coastal Processes pathways and receptors during the construction phase:

- Increase in suspended sediments due to seabed preparation and construction activities;
- Changes to coastal processes and nearshore seabed morphology due to seabed preparation and construction activities; and,
- Impacts on designated features within designated sites;

The following Marine Project activities have the potential to impact on the Physical and Coastal Processes pathways and receptors during the operational and maintenance phase:

- Changes to coastal processes and nearshore seabed morphology from the presence of a piled jetty and mooring dolphins;
- Impacts on designated features within designated sites due to changes in coastal processes;
- Introduction of scour around jetty and moorings and due to propellor wash.
- Impacts to stratification due to changes in wave and tide regime caused by installed infrastructure.

The jetty and associated works are not likely to impact on coastal flood risk due to lack of a pathway, and flood risk is therefore not considered further in the EIA.

6.8 Scoping of Impacts

The potential impacts of the Marine Project on marine physical processes have been summarised in Table 6-2. This Table identifies potential impacts during the construction and operation and maintenance of the Project, with a scoping justification and scoping decision provided.

Table 6-2 Potential Impacts on Marine Physical Processes During Construction, Operation and Maintenance Phases of the Project.

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPING RESULT
Impacts on designated features within designated sites	Construction, Operation & Maintenance	No designated sites for geomorphological features, benthos or marine mammals are located within 10 km of the proposed operations. The project's site falls within the Dales Voe Shellfish Water Protected Area and within the East Mainland Coast, Shetland SPA. Any impact of the piled jetty is considered to only extend to the Dales Voe itself and therefore no pathway to impacts to any other sites are considered. Considering the lack of connectivity between physical processes impact pathways and ornithology, further consideration of physical processes impacts on designated sites is scoped out. .	Scoped out
Changes to coastal processes (includes changes to hydrodynamic, wave and sediment regimes) and nearshore seabed morphology	Construction, Operation & Maintenance	The jetty will be perpendicular to the coast while effects are likely to be small scale and localised. This impact considers the potential for changes due to the presence of structures leading to potential blockage effects and effects related to nearshore wave transformation . The jetty and moorings have the potential to locally affect coastal processes impacting nearshore seabed morphology, However, due to the highly-localised spatial scale of the Marine Project, it is considered that any affects would be highly localised. The prevailing coastal processes are governed by much larger, regional scale oceanographic processes, which would not be disrupted by the presence of the project infrastructure. Although the potential for changes to coastal processes are considered to be minimal, this property is nonetheless investigated on the basis that it constitutes a pathway for onward impacts to other ecological receptors over the operational phase of the Project.	Scoped in

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPING RESULT
		Localised changes to seabed morphology may arise through construction and operation/maintenance activities. Although impacts are only likely to be minimal due to the small scale of the Marine Project, the potential for the loss/alteration of seabed morphology could occur associated with project activities, so the impact is retained as a consideration for other topics.	
Increase in suspended sediments	Construction	Localised alterations to the suspended sediment regime are anticipated as a result of seabed preparation activities and the installation of jetty and moorings. These activities may result in increased Suspended Sediment Concentrations (SSCs).with coarse sediments rapidly deposited and finer sediments transported along the prevailing tidal axis. Again, impacts are only likely to be minimal due to the small scale of the Project, and the broadly quiescent hydrodynamic regime evident within Dales Voe, however there is the potential for localised increases in SSCs associated with construction activities, so the impact is retained and considered as a pathway to other topics.	Scoped in
Introduction of scour	Operation & Maintenance	Evaluates for the potential occurrence of scour around jetty and moorings (and potentially enhanced sediment mobilisation associated with propellor wash around vessels). Prior to installation a scour assessment will be completed to determine the need for protection, and if required, the protection will be installed at construction, thereby mitigating the potential development of scour.	Scoped in
Impacts to stratification	Operation & Maintenance	As it is assessed that the installed infrastructure associated with the Marine Project would not ultimately lead to a change in the wave and tide regime at the project or regional scale, there is not considered to be any onward impact or change to stratification. Understanding of stratification elsewhere on the Scottish continental shelf from the Atlantic - European North West Shelf - Ocean Physics Reanalysis model indicates that should stratification be present, it would be only weak, seasonal, and easily broken down by local wind events during the warmer summer months, with the	Scoped out

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPING RESULT
		potential for temperature and salinity stratification in offshore locations, though persistent or strong stratification is unlikely. Should stratification be present within the Project area, the installed infrastructure through the water column (jetty, moorings) would not be sufficient to significantly enhance mixing to disrupt stratification. Assessments completed by Carpenter *et al.* (2016); Cazenave *et al.* (2016), Dorrel *et al.* (2022) all identified the potential for increased water column mixing as a result of anthropogenic infrastructure in the marine environment. However, the proposed scale of the Project, with one jetty associated with moorings is far smaller than the scales being represented in Dorrel *et al.* (2022). Schultze *et al.* (2020), based on observations for a fixed offshore wind development which identified increased water column mixing in the lee of the structures.. On the basis that stratification, if present, would be weak, seasonal and consistently broken down by wind events , the limited spatial extent of increased water column mixing and consequently potential changes to stratification and the small scale of the Project, it is proposed that the impact of potential changes to stratification is scoped out from further assessment in the EIA.	

6.9 Approach to Analysis and Assessment

Due to the scale of the Project and anticipated limited effects on physical and coastal processes pathways and receptors, no numerical modelling is proposed to be completed. Instead, the assessment is to be completed using a combination of analytical and empirical tools, relying on outputs from existing regional numerical modelling, publicly available data and information and desk-based reviews which will assess the nature and magnitude of potential change on the marine physical and coastal processes receptors and pathways. The assessment methodology is summarised as follows:

- Impacts on designated features within designated sites: Informed by the analyses and assessed for the changes to the prevailing hydrodynamic, wave and sediment transport regime to understand the potential extent and duration of any changes (if at all), with respect to the properties of the designated features within the protected sites.
- Changes to coastal processes and loss / alteration of nearshore seabed morphology (bathymetry and sediment type): Quantify the change in seabed elevation, form and sediment type based on qualitative assessment of the differences with respect to the surrounding seabed and the presence/absence of seabed morphology and the empirical assessment of the likelihood of changes to the prevailing sediment transport regime. Changes to coastal processes will be assessed via a desk-top semi-quantitative analyses on the potential for blockage to currents and effect on nearshore wave transformation and the implications on the prevailing regimes. Consideration on the potential for blockage to sediment transport will be completed in line with the results from the assessment of the effects on wider coastal processes. The assessment will involve a desk-based study using publicly available geotechnical, geological and substrate data and established empirical approaches.
- Increase in suspended sediments: The assessment will rely on the use of publicly available seabed sediment, Suspended Sediment Concentration (SSC) and available climatology data on flow properties (available from the Scottish Shelf Model or the Atlantic- European North West Shelf Ocean Physics Reanalysis data). Semi-quantitative analytical tools will be used to take account of tidal flow properties (speed and direction) and seabed sediment properties (size and settling velocities) in order to determine the lateral translation of material disturbed during construction activities and their influence in terms of SSCs and the wider depositional footprint.

6.10 Summary

The Marine Physical and Coastal Processes topic will be addressed within the EIA. The following impacts are scoped in for further assessment:

- Changes to coastal processes (includes changes to hydrodynamic, wave and sediment regimes) and nearshore seabed morphology (construction and operation and maintenance phases);
- Increase in suspended sediments (construction phase only);
- Introduction of scour (operation and maintenance phase only).

7 WATER AND SEDIMENT QUALITY

7.1 Introduction

This chapter identifies and describes the water and sediment quality receptors of relevance to the Marine Project, highlighting the potential impacts on these receptors during construction and operation and maintenance phases. This chapter focuses on the physical and chemical parameters related to water quality.

The WFD assessment performed as part of the EIA considers the key receptors and impact pathways that contribute to the overall status of a waterbody.

7.2 Legislation, Policy and Guidance

In addition to the relevant policy and legislation described in Section 4 the following section outlines the legislation and guidance considered as part of the assessment of potential impacts on water and sediment quality.

7.2.1 Policy and Legislation

- The WFD (Council Directive 2000/60/EC) aims to protect and enhance water bodies and covers all estuarine and coastal waters out to one NM. This requires that there is no deterioration in the quality of water bodies and aims to achieve good ecological status or potential.
- Water Environment and Water Services (Scotland) Act 2003;
- The Bathing Waters (Scotland) Regulations 2008 (implementing Bathing Water Directive (2006/7/EC));
- Water Environment (Controlled Activities) (Scotland) Regulations 2011;
- The Pollution Prevention and Control (Scotland) Regulations 2012;
- The Water Environment (Shellfish Water Protected Areas: Designation) (Scotland) Order 2013;
- Prevention of Pollution from Ships (MARPOL) Convention;
- Shetland Islands Regional Marine Plan – Policy MP WAT1 – Water Ecology:
    - "Proposals for marine development and use should consider the likely effects, including cumulative effects, on water quality and the benthic environment. Proposals should not cause any waterbody to deteriorate in quality or ecological status, nor prevent the achievement of established objectives set out in the Scotland River Basin Management Plan. Where there is a significant risk that relevant objectives will not be achieved, applicants may be required to identify how the proposal will contribute to achieving relevant objectives to improve the chemical and ecological status of coastal water bodies."; and,
- Scotland's NMP. General Policy 12. The Scottish Government, 2015.
    - "Water quality and resource: Development and activities should not result in a deterioration of the quality of waters to which the WFD, Marine Strategy Framework Directive (MSFD) or other related Directives apply".

7.2.2 Guidance

- Coastal and marine environmental site guide (Environment Agency, 2003);
- SEPAs Guidance for Pollution Prevention (GPPs)[10]

7.3 Study Area

The study area applied for this topic is a 5 km buffer around the Project, based on the spring tidal excursion ellipse. This is considered to provide a sufficient worst case area of impact from the Marine Project reflecting the maximum excursion distance of suspended sediments transported under the forcing of tidal currents.

The water and sediment quality receptors considered within this chapter include designated waterbodies, bathing waters, shellfish water protected areas, sensitive areas and sediment quality within the vicinity of the Project.

7.4 Data and Information Sources

The existing data sets and literature with relevant coverage to the Marine Project, which have been used to inform this Scoping Report and would inform the baseline characterisation for the EIA as appropriate are outlined in Table 7-1.

Table 7-1 Summary of key sources of information for marine water and sediment quality receptors.

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
Dales Voe Ultra-Deep-Water Quay EIA Scoping Report	https://marine.gov.scot/sites/default/files/dales_voe_ultra-deep-water_quay_eia_scoping_report_redacted.pdf	2024	Environcentre
Shetland Islands Marine Region State of the Environment Assessment	https://www.shetland.uhi.ac.uk/t4-media/one-web/uhi-shetland-images-and-documents/research/document/marine-spatial-planning/state-of-environment-assessment/shetland-state-of-the-marine-environment-assessment-april-17.pdf	2017	Shucksmith
Scotland's Marine	https://marine.gov.scot/sma/	2020	Marine Scotland

[10] *https://www.sepa.org.uk/regulations/pollution-prevention-and-control/*

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Assessment 2020			
Waterbody data sheets	https://www2.sepa.org.uk/WaterBodyDataSheets/	2012	Scottish Environment Protection Agency (SEPA)
Convention for Protection of the Marine Environment of the North-East Atlantic (OSPAR) Intermediate Assessment 2017 – Contaminant assessments	https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/pressures-human-activities/contaminants	2017	OSPAR
River Basin Management 3 database	https://informatics.sepa.org.uk/RBMP3/	2025	SEPA
Scotland's water environment 2019: A summary and progress report	https://www.sepa.org.uk/media/490771/191219_scotlands-water-environment-final.pdf	2019	SEPA
Urban Wastewater Treatment Directive Sensitive Areas Map 2019	https://www.gov.scot/binaries/content/documents/govscot/publications/map/2016/01/urban-waste-water-treatment-sensitive-areas-map/documents/urban-waste-water-treatment-sensitive-areas-map-2019/urban-waste-water-treatment-sensitive-areas-map-2019/govscot%3Adocument/UWWTD%2Bdesignations%2B2019.pdf	2020	SEPA
Coastal Water Body Classifications (as per WFD (2000/60/EC)	https://map.environment.gov.scot/sewebmap/?layers=coastalClass	2020	SEPA
Clean Seas Environmental	https://www.bodc.ac.uk/resources/portals_and_links/merman/project_overview/	2020	BODC

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Monitoring Programme (CSEMP)			
Water Framework Directive (WFD) River Basin Management Plan (RBMP) Waterbody status	https://www.sepa.org.uk/data-visualisation/water-environment-hub/	2023	SEPA
Annual updates on the condition of the water environment	https://www.sepa.org.uk/data-visualisation/water-classification-hub	2023	SEPA
Scotland's Environment data tool for Bathing Waters	https://bathingwaters.sepa.org.uk/classifications/	2026	SEPA
Marine Protected Area (MPA) mapper	https://jncc.gov.uk/our-work/marine-protected-area-mapper/	2023	Joint Nature Conservation Committee (JNCC)
Atlas of UK Marine Renewable Energy, Interactive Map	https://www.renewables-atlas.info/explore-the-atlas/	2018	ABPmer

7.5 Baseline Environment

7.5.1 Designated Sites

The Project's site falls within the Dales Voe Shellfish Water Protected Area (SEPA) (Figure 11-1). Furthermore, the area of proposed works overlaps with the Dales Voe (South Mainland) designated coastal water body (ID: 200250) which is listed in 'Good' overall status, 'Good' water quality and 'High' physical condition based on 2023 data (SEPA, 2025).

There are no designated bathing waters within 2 km of the Project area.

7.5.2 Sediment and water quality

Information about the prevailing seabed sediments is provided in Section 6.5.1. Findings from the analyses of sediments sampled for the Dales Voe Ultra-Deep-Water Quay (Envirocentre, 2024) indicated sediment contamination was negligible. The scoping report mentions that three grab samples (DV14, DV15 and DV16) were collected at Dales Voe by EnviroCentre in 2017 and analysed by Fugro. Analytical results showed that the key contaminant levels of concern were below Scottish Action Level 1[11] for all samples and analytes with the exception of one sampling station (DV14) which recorded a marginal exceedance of zinc recording a sample concentration of 149 mg/kg against Action Level 1 of 130mg/kg. The scoping report concludes that no exceedances of Action Level 2 were recorded (Envirocentre, 2024).

Due to the lack of significantly elevated contaminant concentrations in the vicinity of the only potential source of contamination within Dales Voe, it is reasonable to conclude that the sediment proximal to the Marine Project will be clean and contain no, or highly limited, contaminants.

Due to the local water indicating 'good' or 'high physical condition (see Section 7.5) for the 'Dales Voe Ultra Deep Water Quay Development'; the Scottish Ministers were in agreement with water contamination being scoped out from further assessment (Scottish Government, 2024b).

7.6 Embedded Mitigation Proposed

Certain measures have been proposed as part of the Project development process in order to reduce the potential for impacts to the environment. These measures will follow best practice and are described as follows:

- Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a Marine Pollution Contingency Plan (MPCP), biosecurity assessment and waste management plan.
- Visual inspections to be conducted regularly during the jetty construction to monitor water turbidity caused by increased sediment loading. If a sediment plume is observed which is not readily settling, or is being transported into the wider Dales Voe, additional mitigation (e.g. silt curtain) may be considered.

7.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on sediment and water quality during the construction phase:

- Impacts on water quality status of designated waters through sediment disturbance during seabed preparation and jetty construction leading to increased SSC;
- Changes in water and sediment quality due to potential release of contaminants and accidental spills from vessels and during transfer along the jetty (e.g. ammonia spillage); and

[11] *Material with contaminant concentrations below AL1 are considered to be clean and of little environmental concern.*

- Introduction of INNS through vessels.

The following Marine Project activities have the potential to impact on sediment and water quality during the operations and maintenance phase:

- Impacts on water quality status of designated waters through release of contaminants;
- Potential release of contaminants and accidental spills from vessels; and,
- Introduction of INNS through vessels.

7.8 Scoping of Impacts

The potential impact pathways for water and sediment quality receptors identified within Section 7.7 are summarised in Table 7-2, which details the scoping assessment for the topic.

Table 7-2 Scoping assessment for water and sediment quality topic.

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPING RESULT
Impacts on water quality status of designated waters	Construction, Operation & Maintenance	Activities related to seabed preparation and jetty construction can cause increased SSC and disturb contaminated sediments. Water quality within Dales Voe is listed in 'Good' overall status, 'Good' water quality and 'High' physical condition. The Dales Voe Ultra-Deep-Water Quay Scoping Report (Envirocentre, 2024) show that in the vicinity of the Tagdale Project area the sediment contaminant levels were below Action Level 1 for all samples and analytes with the exception of one sampling station which recorded a marginal exceedance of zinc. No exceedance of Action Level 2 were reported. Sediment contamination within Dales Voe is therefore considered to be of little environmental concern, and in absence of other potential industrial sources of contamination besides the decommissioning yard, it is not likely that elevated contaminants levels would be found in the area of the Marine Project. Due to this and that sediment disturbance is likely to be minimal no further sediment sampling and analysis is considered necessary, and there is little potential for the works proposed as part of the Marine Project to lead to the spread of contaminants in the marine environment. Increases in SSC would be temporary and localised, due to the prevailing sediment characteristics (i.e. grain size) and the broadly quiescent tidal regime (see Section 6.5.2). Consequently mobilised sediments entrained into the water column would likely deposit rapidly, with SSCs returning to background levels after a short period following cessation of the operation.	Scoped out

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPING RESULT
		Contaminants may be released from vessels used in the construction or operation and maintenance phase with INNS potentially also introduced during the construction and operation and maintenance phase. Embedded mitigation measures described above minimise those risks. The Project's site falls within the Dales Voe Shellfish Water Protected Area; however considering the highly localised effects arising from sediment disturbance, the very low levels of contaminants recorded in the nearby area and embedded mitigation, this impact pathway is scoped out.	
Changes in water and sediment quality due to accidental discharges from vessels	Construction, Operation & Maintenance	Installation and operation activities may potentially result in reduced water and sediment quality in the vicinity due to accidental discharges from vessels. The risk will be adequately managed through the embedded mitigation measures, which will reduce the risk of accidental discharges. In addition, implicit vessel and environmental protocols in line with international standards will inherently limit the risk from vessel discharges and any onward impacts to wate rand sediment quality. Therefore, the impacts are likely to be short lived and very localised.	Scoped out
Changes in water and sediment quality due to accidental leakage of ammonia	Operation and Maintenance	Accidental release of ammonia during transfer along, and from the jetty (e.g. during offloading to transport vessels) and vessels is an unlikely but potential occurrence. Ammonia is a chemical compound that is naturally present in aquatic ecosystems. Globally, ammonia concentrations in freshwater and marine environments typically range from 0 to 0.2 mg/L (Yun *et al.*, 2026) and exceedances of this may impact the marine water and sediment quality. Reported incidents of ammonia being spilled into seawater are very rare. The temperature of liquid ammonia will however be low; and therefore in the case of a spillage in the marine environment, this might cause some localised rapid reductions in the temperature of the receiving waters, however this would be short term and temporary. Studies have indicated that for large surface spills, approximately 60% of the spilled volume would dissolve with the remaining ammonia evaporating (ITOPF, 2024). When compared to oil spills for example, ammonia spills are less likely to disperse as widely and do not persist as long in the environment (Environmental Defense Fund, 2022). Ammonia dissolved in the marine environment would affect the alkalinity of the marine carbonate system locally, with the extent depending on quantity discharged and local mixing.	Scoped out

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPING RESULT
		The impacts related to ammonia leakage are scoped out on the basis of the Project being designed and constructed to comply with industry good practice for pollution prevention, the above ground infrastructure being secure and only accessible to suitably trained and authorised workers, below ground infrastructure being constructed to suitable standards to minimise the risk of pollution through leakage or accidental release, appropriate inspection and maintenance of pollution prevention measures being implemented during operation of the Project, and all operations being subject to the Health and Safety at Work Act (1974), and regulations made under this Act. During the operational phase, ammonia will be provided with appropriate secondary containment measures to reduce the risk of leaks and spillages which will subsequently reduce the likelihood of contamination of the marine environment. Best chemical handling practice will be applied when the ammonia export vessel is loaded to ensure no spills occur. Due to the low likelihood of a spill occurring, the impact is scoped out.	
Introduction of INNS from vessels	Operation & Maintenance	Embedded mitigation for introduction of INNS during the Operations and Maintenance phase will minimise that risk. Therefore, this impact pathway is scoped out.	Scoped out

7.9 Approach to Analysis and Assessment

Water and sediment quality receptors are scoped out of further assessment in the EIA.

7.10 Summary

Water and sediment quality receptors are scoped out of further assessment in the EIA.

8 BENTHIC ECOLOGY

8.1 Introduction

This chapter provides an overview of the sensitivities associated with the marine benthic receptors relevant to the Marine Project. An overview of the potential impacts of the Marine Project on benthic ecology, including during the construction and operation and maintenance phases of the Marine Project, are also discussed.

8.2 Legislation, Policy and Guidance

In addition to the relevant policy and legislation described in Section 4, the following section outlines the legislation, policy and guidance that will be taken into consideration for the assessment of potential impacts on benthic ecology receptors within the Study Area.

8.2.1 Legislation and Policy

The following legislation and policies are considered relevant:

- Nature Conservation (Scotland) Act 2004;
- Scotland's Biodiversity: a route map to 2020 (Scottish Government, 2015);
- Scotland's NMP. General Policy 9. Scottish Government, 2015:
    - "Natural heritage: Development and use of the marine environment must:
    - Comply with legal requirements for protected areas and protected species;
    - Not result in significant impact on the national status of Priority Marine Features (PMFs);
    - Protect and, where appropriate, enhance the health of the marine area."
- Scotland's NMP. General Policy 10. Scottish Government, 2015.
    - "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";
- Shetland Regional Marine Plan (2025);
- Policy MP INNS1: Reducing the Spread of Invasive Non-native Species
    - "Proposals for marine development and use should consider the potential risks of introducing or spreading INNS, having regard to the Scottish Government's Non-native Species: Code of Practice. Where there is a risk of proposals establishing new pathways for the spread of INNS, applicants should identify relevant measures to reduce these risks. The assessment and identification of these risks and relevant measures could be set out in a biosecurity plan. Particular risks may occur when moving equipment, boats or aquatic animals (e.g., fish and shellfish), introducing structures suitable for settlement of aquatic INNS or which facilitate the movement of terrestrial INNS, including to islands. Proposals in areas where INNS are known to exist should seek to minimise the risk of further spread or reintroduction. Applicants should refer to the associated SIRMP Supporting Guidance on Biosecurity.";
- Policy MP BIOD1: Protected Sites and Species:

- "Proposals for marine development and use must comply with all legal requirements for protected areas and protected species, and should consider potential direct and indirect effects, including disturbance and any cumulative impacts."
- "Internationally Designated Sites: Proposals that may affect a European Site (SACs and SPAs) must comply with the relevant legislation and will only be supported where they meet the relevant statutory tests. All Ramsar sites are also European Sites and/or SSSIs and are extended protection under the relevant statutory regimes."
- "Nationally Designated Sites: Proposals that could affect Nature Conservation MPAs or Demonstration and Research MPAs must comply with the relevant legislation for these protected areas. Proposals that could affect a SSSI or National Nature Reserve must comply with the relevant legislation for these protected areas."
- "Seal Haul-Out Sites: Proposals that could affect a designated seal haul-out site should consider how they will avoid harassment of seals. Applicants should have regard to the Harassment at Seal Haul-Out Sites: Guidance."
- "Local Nature Conservation Sites: Proposals that could affect a site designated as a Local Nature Conservation Site (LNCS) should have regard to SIC's Local Development Plan and its Supplementary Guidance on LNCS."
- "Protected Species: Proposals for marine development or use that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present, or may be affected by a proposal, steps must be taken to establish their presence. Applicants should consider within the planning and design of the proposal the level of protection afforded by legislation and should fully consider any impacts to protected species.";

– Policy MP BIOD2: PMFs:
  - "Proposals must not result in significant negative impacts on the national status of Priority Marine Features (PMFs). Applicants should consider if impacts will affect PMFs in Shetland. Applicants should consider mitigation measures, including alternative locations, where potential adverse impacts on PMFs are identified.";
– Policy MP BIOD3: Local Habitat Protected Areas:
  - "Proposals for marine development and use should consider potential impacts on the Shetland Shellfish Management Organisation (SSMO) closed areas.* Where a proposal may have an adverse direct or indirect effect on the priority marine features protected within an SSMO closed area, applicants may be required to demonstrate: a) there will be no adverse effects on the national status of the PMF, or the status of the PMF in Shetland; or b) there are no reasonable alternatives or less ecologically damaging locations; and c) mitigation measures to minimise the impacts on the priority marine features have been considered. *Those which were in place by December 2019"; and,
– Policy MP BIOD4: Furthering the Conservation of Biodiversity:
  - "Development and use of the marine environment must protect and, where appropriate, enhance the health of Shetland's marine area so far as is consistent with the exercise of functions relating to the proposed development or use. Where proposals may have a significant adverse effect on biodiversity or the ecosystem services of biodiversity, including any cumulative impact, the applicant should further consider measures to avoid, minimise, or mitigate any harm or disturbance to the ecosystem services, continuity, and integrity of the habitats or species affected. Applicants should

consider impacts on areas which are important to all aspects of a species' life cycle including locations used for breeding, nesting, resting, foraging and seasonal use, including overwintering.".

8.2.2 Guidance

The following guidance is considered relevant:

- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018);
- Identification of the Main Characteristics of Stony Reef Habitats under the Habitats Directive (Irving, 2009);
- Scottish Natural Heritage (SNH) (now NatureScot) guidance: Guidance on Survey and Monitoring in Relation to Marine Renewable Developments in Scotland – Volume 5: Benthic Habitats (SNH, 2011);
- Refining the criteria for defining areas with a 'low resemblance' to Annex I stony reef (Golding *et al.*, 2020); and
- PMFs, as described in NatureScot Commissioned Report 388 (Tyler-Walters *et al.*, 2016).

8.3 Study Area

The Study Area for benthic ecology is set using a radius of 10 km around the Project area (Figure 8-1).

8.4 Data and Information Sources

Publicly available data used to inform this scoping assessment are presented in Table 8-1.

Table 8-1 Summary of key sources of information for benthic ecology receptors.

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Conservation Areas and Protected Sites			
MPA mapper	https://jncc.gov.uk/our-work/marine-protected-area-mapper/	2023	JNCC
NatureScot – Scotland's MPA Network	https://www.nature.scot/professional-advice/protected-areas-and-species/protected-areas/marine-protected-areas/scotlands-marine-protected-area-network	2023	NatureScot
Scotland's Marine Assessment 2020	https://marine.gov.scot/sma/	2020	Scottish Government
Benthic Environment			
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
Shetland Islands Marine Region State of the Marine	https://marine.gov.scot/?q=information/shetland-islands-marine-region-state-marine-environment-assessment	2017	Shetland Islands Marine Planning Partnership

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Environment Assessment			
NatureScot	https://www.nature.scot/doc/priority-marine-features-guidance	2016	Tyler-Walters et al.
Biosecurity Plan for the Shetland Islands	https://www.shetland.uhi.ac.uk/research/marine-spatial-planning/shetland-islands-regional-marine-plan/shetlands-marine-industries/biosecurity-plan-for-the-shetland-islands/	2015	Collin *et al.*
Marine Life Information Network (MARLIN)	https://www.marlin.ac.uk/home	2026	MARLIN
British Geological Survey (BGS) Offshore GeoIndex Map	https://www.bgs.ac.uk/map-viewers/geoindex-offshore/	2023	BGS
SEA Data Portal	https://www.bgs.ac.uk/technologies/databases/strategic-environmental-assessment-sea-data-portal/	2021	BGS
National Marine Plan interactive (NMPi)	https://marinescotland.atkinsgeospatial.com/nmpi/	2023	NMPi
Scottish Natural Heritage (SNH) Commissioned Report No. 446.	An assessment of conservation importance of species and habitats identified during a series of recent research cruises around Scotland. https://tethys.pnnl.gov/publications/assessment-conservation-importance-species-habitats-identified-during-series-recent	2011	Moore and Roberts
EMODnet Bathymetry	https://www.emodnet-bathymetry.eu/	2023	EMODnet

8.5 Baseline Environment

8.5.1 PMF habitats

The review of the publicly available data has shown the presence of the following PMF benthic habitats in the vicinity (10 km) of the proposed Marine Project (Figure 8-1), including:

- Tide-swept algal communities;
- Blue mussel beds;
- Horse mussel beds;
- Kelp and seaweed communities on sublittoral sediment;

- Kelp beds;
- Low or variable salinity habitats;
- Maerl beds;
- Seagrass beds; and
- Tide-swept coarse sands with burrowing bivalves.

8.5.2 PMF species

The review of the publicly available data has shown the presence of the following PMF benthic species in the vicinity of the proposed works (Figure 8-1), including:

- Ocean quahog (*Arctica islandica*);
- European spiny lobster (*Palinurus elephas*); and
- White cluster anemone (*Parazoanthus anguicomus*).

8.5.3 Annex I habitats

The review of the publicly available data has shown the presence of the following Annex I habitats within a radius of 10 km (Figure 8-1), including:

- Bedrock and/or stony reefs; and
- Biogenic reefs.
  There is potential that the proposed works will overlap with potential Annex I reefs.

8.5.4 Other protected benthic habitats and species

The review of publicly available information (MarLIN, 2025) has shown that the presence of the following potentially sensitive habitats is likely in the intertidal zone in the area of proposed works. These habitats are listed in the Bern Convention and include:

- *Semibalanus balanoides*, *Patella vulgata* and *Littorina* spp. on exposed to moderately exposed or vertical sheltered eulittoral rock (EUNIS A1.1131);
- Oligochaetes in littoral mobile sand (EUNIS A2.222);
- Shingle beach driftline (EUNIS B2.1);
- Yellow and grey lichens on supralittoral rock (EUNIS B3.111); and,
- *Verrucaria maura* on very exposed very sheltered upper littoral fringe rock (EUNIS B3.1132).

8.5.5 Designated sites

The review of the publicly available data has shown that there are no sites designated for the conservation of benthic habitats/species within a radius of 10 km (at sea distance). The closest MPA designated for benthic habitats/species is the Mousa SAC found at 24.7 km from the Marine Project. This SAC is designated for reefs and submerged or partially submerged sea caves.

8.5.6 Invasive Non-Native Species (INNS)

The Scottish Government (2025b) and NatureScot (2025a) provide a list of INNS that have been recorded in Scottish waters. Specifically, these are:

- Wireweed (*Sargassum muticum*);
- Green sea-fingers (*Codium fragile* subsp. *Tomentosoides*);
- Red alga (*Dasysiphonia japonica*);
- Acorn barnacle (*Austrominius modestus*);
- Japanese skeleton shrimp (*Caprella mutica*);
- Leathery sea squirt (*Styela clava*);
- Orange tipped sea squirt (*Corella eumyota*);
- Orange ripple bryozoan (*Schizoporella japonica*).
- American lobster (*Homarus americanus*);
- Carpet sea squirt (*Didemnum vexillum*);
- Pacific oyster (*Magallana gigas*);
- Japanese kelp, wakame (*Undaria pinnatifida*); and,
- Slipper limpet (*Crepidula fornicata*).

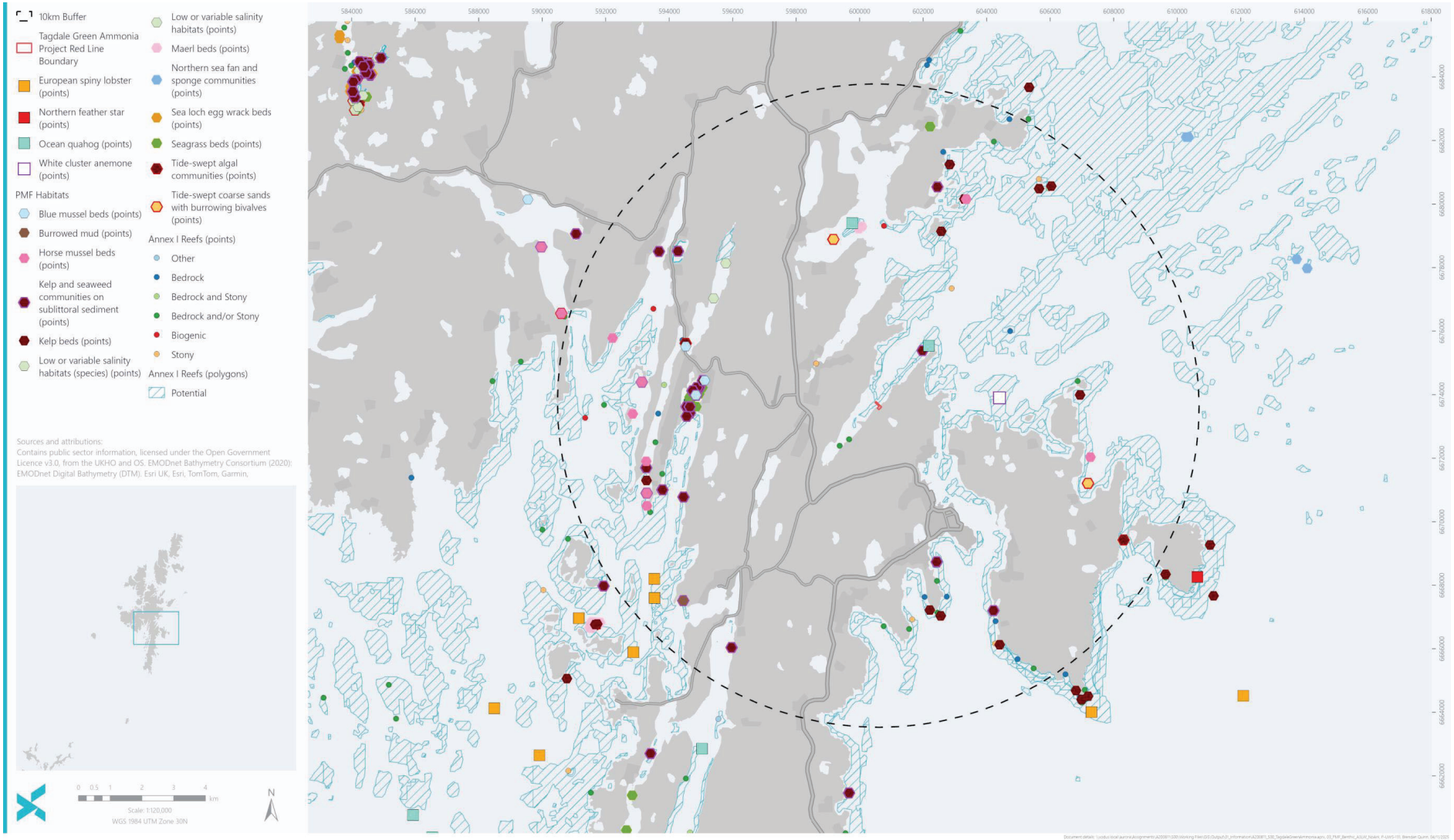

Figure 8-1 Policy important habitats and species (PMF, Annex I) within a radius of 10 km from the Project area.

8.6 Embedded Mitigation Proposed

Certain measures have been proposed as part of the Project in order to reduce the potential for impacts to the environment. The measures implemented related to benthic ecology will follow best practice and are described as follows:

- Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a MPCP, biosecurity assessment and waste management plan.

The requirement for additional mitigation measures (secondary mitigation) will be dependent on the significance of the effects on benthic ecology receptors and will be consulted upon with consultees throughout the EIA process.

8.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on benthic ecology receptors during the construction phase:

- Temporary habitat loss or disturbance due to seabed preparation activities, jetty and moorings installation, anchors and spud legs from vessels;
- Increased SSCs due to seabed disturbance (seabed preparation, jetty and moorings installation, use of anchors and spud legs) leading to smothering of benthos;
- Increased risk of INNS introduction due to the use of construction vessels;
- Impacts to habitats and species due to pollution or accidental discharge from vessels and during transfer along the jetty (including ammonia leakages); and
- Disturbance of contaminated sediments due to seabed preparation, installation of jetty and moorings, use of anchors and spud legs from vessels.

The following Marine Project activities have the potential to impact on benthic ecology receptors during the operation and maintenance phase:

- Long term habitat loss due to presence of jetty and moorings;
- Increased risk of introduction and spread of INNS due to the use of vessels;
- Impacts to habitats or species as a result of pollution/accidental release of contaminants form vessels;
- Hydrodynamic changes leading to scour/localised movement of sediment due the presence of jetty and moorings; and,
- Colonisation of jetty and moorings from epifauna.

8.8 Scoping of Impacts

A number of potential impacts on benthic ecology receptors have been identified, which may occur during the construction, operation and maintenance phases of the Project. The potential impacts have been summarised in Table 8-2.

Table 8-2 Potential Impacts on benthic ecology During Construction, Operation and Maintenance Phases of the Project.

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Long-term loss to benthic habitats and species	Operation & Maintenance	There is the potential for the long-term loss to benthic habitats or species as a result of activities relating to the operation and maintenance of the Marine Project (e.g., jetty and moorings presence).	Scoped in
Temporary habitat loss or disturbance	Construction, Operation & Maintenance	There is the potential for the temporary loss or damage to habitats or species as a result of activities relating to the construction, operation and maintenance of the Marine Project (e.g., seabed preparation, anchors/spud legs from vessels and general maintenance activities)	Scoped in
Increased SSCs and associated deposition	Construction	Sediment disturbance resulting from construction activities may result in increased SSCs and may result in indirect impacts on benthic communities (e.g. smothering) resulting from the associated impacts of sediment deposition.	Scoped In
Increased risk of introduction and spread of INNS	Construction, Operation & Maintenance	Vessel movements during construction, operation and maintenance can result in the spread of INNS. The CEMP will include a specific INNS plan, which will demonstrate and ensure that all required measures are implemented so that the potential for introduction of INNS are minimised (e.g. adherence to relevant legislation and guidance). Through these measures the discharges of ballast waters and the biofouling of project vessels will be strictly controlled. There will be a minimal increase in vessel activity to the area due to the small scale of the development. For these reasons, this impact has been scoped out.	Scoped out
Impact to habitats or species as a result of pollution or accidental discharge	Construction, Operation & Maintenance	Accidental release of pollutants from Project vessels. The magnitude of an accidental spill incident from Marine Project vessels is limited by the size of chemical or oil inventory on such vessels. Embedded mitigation measures will be adopted to ensure that the potential for accidental release of pollutants is limited, including strict controls on vessel activities and procedures. For these reasons, the impacts of pollution or accidental discharge to the benthic ecology has been scoped out.	Scoped out

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Impacts to habitats or species due to accidental leakage of ammonia	Operation & Maintenance	Accidental release of ammonia from jetty (e.g. during offloading to transport vessels) and vessels is an unlikely but potential occurrence. Ammonia is a chemical compound that is naturally present in aquatic ecosystems. Globally, ammonia concentrations in freshwater and marine environments typically range from 0 to 0.2 mg/L (Yun *et al.*, 2026) and exceedances of this may impact the marine water and sediment quality. Reported incidents of ammonia being spilled into seawater are very rare. Temperature of liquid ammonia will however be low; and therefore in the case of a spillage in the marine environment, this might cause some localised rapid reductions in the temperature of the receiving waters, however this would be short term and temporary.. Studies have indicated that for large surface spills, approximately 60% of the spilled volume would dissolve with the remaining ammonia evaporating (ITOPF, 2024). When compared to oil spills, for example, ammonia spills are less likely to disperse as widely and do not persist as long in the environment (Environmental Defense Fund, 2022). Ammonia dissolved in the marine environment would affect the alkalinity of the marine carbonate system locally, with the extent depending on quantity discharged and local mixing. Excessive amounts of ammonia can disrupt homeostasis and cause toxic effects in various aquatic species, with high ammonia levels leading to impaired ion balance, disturb nitrogen metabolism, trigger oxidative stress and affect neurophysiological functions at the intra-cellular level (Yun *et al.*, 2026). Furthermore, ammonia can damage vital tissues, eliciting species-specific differential responses in fish and invertebrates, and impair survival, development, reproductive ability, and movement. The impacts related to ammonia leakage are however scoped out on the basis of the Project being designed and constructed to comply with industry good practice for pollution prevention, the above ground infrastructure being secure and only accessible to suitably trained and authorised workers, below ground infrastructure being constructed to suitable standards to minimise the risk of pollution through leakage or accidental release, appropriate inspection and maintenance of pollution prevention measures being implemented during operation of the Project, and all operations being subject to the Health and Safety at Work Act (1974), and regulations made under this Act. During the operational phase, during transport of ammonia,	Scoped out

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
		appropriate secondary containment measures will be utilised to reduce the risk of leaks and spillages which will subsequently reduce the likelihood of contamination migrating into the marine environment. Best chemical handling practice will be applied when the ammonia export vessel is loaded to ensure no spills occur. Due to the low likelihood of a spill occurring, the impact is scoped out.	
Disturbance of contaminated sediments	Construction	The site of proposed works is located away from heavy industry and other potential significant contamination sources. This is supported from findings included in the EIA Scoping Report for the Dales Voe Ultra-Deep-Water Quay (Envirocentre, 2024). Analytical results showed that the key contaminant levels of concern were below Action Level 1 for all samples and analytes with the exception of one sampling station which recorded a marginal exceedance of zinc. In addition, that Scoping Report mentions that no exceedances of Action Level 2 were recorded (Envirocentre, 2024) (See Section 7.5). The information above highlight that there is negligible risk for benthic habitats and organisms to be exposed in toxic contaminants.	Scoped out
Hydrodynamic changes leading to scour around subsea infrastructure	Operation & Maintenance	Localised movement of sediments as a result of infrastructure placements relating to the Project is unlikely due to the low energy environment in the Tagdale Project area (see Section 6). Due to this, impacts on benthic habitats and organisms arising from scour and associated loss of sedimentary habitats are negligible. For these reasons, this impact has been scoped out.	Scoped out
Colonisation of hard structures	Operation & Maintenance	Artificial structures placed on the seabed (i.e. jetty, moorings) may result in colonisation by marine organisms. Considering the highly localised footprint of the jetty and moorings it is concluded that any changes in biodiversity due to the presence of infrastructure will be negligible. Therefore, the impact pathway has been scoped out.	Scoped out

8.9 Approach to Analysis and Assessment

The assessment of impacts arising from the construction, operation and maintenance phases of the Marine Project on benthic ecology will utilise project-specific and publicly available data and will be augmented by consultation during the EIA phase. The assessment criteria will be consistent with the approach recommended by Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Both direct and indirect impacts will be assessed. Direct impacts include those generated by direct interaction of the project activities with the seabed environment, such as physical disturbance of the seabed within the project footprint. Indirect impacts are those produced as a result of an impact pathway, for example the resettlement of disturbed sediments outside the footprint of the project. The seabed area affected by both direct and indirect impacts will be quantified, informed by the maximum design scenario for the Project. The magnitude of the impact will be derived from the maximum design scenarios for the Project in the context of the wider environment. The sensitivity, vulnerability and recoverability of benthic habitats and species of conservation importance identified in the Marine Project area will be assessed in relation to the type, extent and duration of disturbance using the Scottish Government's Feature Activity Sensitivity Tool (FeAST) and the MarLIN (2025).

The presence of Annex I habitats and PMFs will be identified in the baseline characterisation and the significance of the potential impacts on these features of conservation importance will be assessed based on established criteria.

8.9.1 Site-specific surveys recommendations

Scotland's NMP includes a policy that no proposal can have an adverse effect on the national status of a PMF, and any application must be able to demonstrate the proposal to be compliant with this requirement.

The examination of publicly available data has shown that in the area of the Project and its vicinity have shown the presence of habitats and species that are protected by legislation (e.g. ocean quahog, tide-swept algal communities). Due to the above, appropriate site-specific benthic habitat assessment surveys and mapping (e.g., drop-down camera surveys, grab sampling) are required in the area of the Project and its vicinity in order to capture the benthic sensitivities that may be affected from the proposed works (e.g. biogenic reefs). The surveys would include the intertidal and subtidal areas in the vicinity of the Marine Project. The surveys should take place both for epifaunal and infaunal organisms considering the type of sediments encountered in the area (soft sedimentary habitats, rocky substrates). Any INNS identified during benthic surveys will be recorded[12].

8.10 Summary

The Benthic Ecology topic will be addressed within the EIA. The following impacts are scoped in for further assessment:

- Long-term loss to benthic habitats and species (operation and maintenance phase);
- Temporary habitat loss or disturbance (construction and operation and maintenance phases);

[12] *However, the surveys will not specifically be looking for INNS.*

- Increased SSCs and associated deposition (construction phase).

9 FISH AND SHELLFISH ECOLOGY

9.1 Introduction

This chapter will provide an overview of the sensitivities associated with the marine fish. and shellfish. ecology receptors relevant to the Marine Project. An overview of the potential impacts of the Marine Project on fish and shellfish ecology, including during the construction, operation and maintenance of the Marine Project, are also discussed.

9.2 Legislation, Policy and Guidance

In addition to the relevant policy and legislation described in Section 4, the following section outlines the legislation and guidance that will be taken into consideration when assessing the potential impacts on fish and shellfish ecology receptors present within the Study Area.

9.2.1 Legislation and Policy

The following legislation and policy are considered relevant:

- Nature Conservation (Scotland) Act 2004;
- Wildlife and Natural Environment (Scotland) Act 2011;
- Scotland's Biodiversity: a route map to 2020 (Scottish Government, 2015);
- Scotland's NMP. General Policy 9. The Scottish Government, 2015. Natural heritage: Development and use of the marine environment must:
    - Comply with legal requirements for protected areas and protected species;
    - Not result in significant impact on the national status of PMFs;
    - Protect and, where appropriate, enhance the health of the marine area.
- PMFs list (Tyler-Walters *et al.*, 2016);
- Shetland Islands Regional Marine Plan (2025);
- MP BIOD1: Protected Sites and Species:
    - Proposals for marine development and use must comply with all legal requirements for protected areas and protected species, and should consider potential direct and indirect effects, including disturbance and any cumulative impacts."
    - Internationally Designated Sites: Proposals that may affect a European Site (SACs and SPAs) must comply with the relevant legislation and will only be supported where they meet the relevant statutory tests. All Ramsar sites are also European Sites and/or SSSIs and are extended protection under the relevant statutory regimes."
    - Nationally Designated Sites: Proposals that could affect Nature Conservation MPAs or Demonstration and Research MPAs must comply with the relevant legislation for these protected areas. Proposals that could affect a SSSI or National Nature Reserve must comply with the relevant legislation for these protected areas.

  - Seal Haul-Out Sites: Proposals that could affect a designated seal haul-out site should consider how they will avoid harassment of seals. Applicants should have regard to the Harassment at Seal Haul-Out Sites: Guidance;
  - Local Nature Conservation Sites: Proposals that could affect a site designated as a LNCS should have regard to Shetland Islands Council's Local Development Plan and its Supplementary Guidance on LNCS;
  - Protected Species: Proposals for marine development or use that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present, or may be affected by a proposal, steps must be taken to establish their presence. Applicants should consider within the planning and design of the proposal the level of protection afforded by legislation and should fully consider any impacts to protected species;
- MP BIOD2: Priority Marine Features:
  - Proposals must not result in significant negative impacts on the national status of PMFs. Applicants should consider if impacts will affect PMFs in Shetland. Applicants should consider mitigation measures, including alternative locations, where potential adverse impacts on PMFs are identified.
- MP BIOD4: Furthering the Conservation of Biodiversity:
  - Development and use of the marine environment must protect and, where appropriate, enhance the health of Shetland's marine area so far as is consistent with the exercise of functions relating to the proposed development or use. Where proposals may have a significant adverse effect on biodiversity or the ecosystem services of biodiversity, including any cumulative impact, the applicant should further consider measures to avoid, minimise, or mitigate any harm or disturbance to the ecosystem services, continuity, and integrity of the habitats or species affected. Applicants should consider impacts on areas which are important to all aspects of a species' life cycle including locations used for breeding, nesting, resting, foraging and seasonal use, including overwintering.

9.2.2 Guidance

Relevant guidance includes:

- Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018).

9.3 Study Area

The Study Area for this topic is considered to be a 10 km buffer around the Project. The Study Area extent is illustrated in Figure 9-1 to

Figure 9-4.

9.4 Data and Information Sources

Publicly available data used to inform this Scoping Assessment are presented in Table 9-1.

Table 9-1 Summary of key sources of information for fish and shellfish ecology receptors

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
Mapping the spawning and nursery grounds of selected fish for spatial spawning	https://docslib.org/doc/10530704/spawning-and-nursery-grounds-of-selected-fish-species-in-uk-waters	2012	Ellis *et al.*
Fishery sensitivity maps in British waters	https://marine.gov.scot/data/fisheries-sensitivity-maps-british-waters-coull-et-al-1998	1998	Coull *et al.*
Updating fisheries sensitivities maps in British waters	https://data.marine.gov.scot/dataset/updating-fisheries-sensitivity-maps-british-waters	2014	Aires *et al.*
Spawning grounds of Atlantic cod (*Gadus morhua*) in the North Sea	https://academic.oup.com/icesjms/article/73/2/304/2614292	2016	González-Irusta and Wright
Spawning grounds of haddock (*Melanogrammus aeglefinus*)	https://www.sciencedirect.com/science/article/abs/pii/S0165783616301771?via%3Dihub	2016	González-Irusta and Wright
Spawning grounds of whiting (*Merlangius Merlangus*)	https://www.sciencedirect.com/science/article/abs/pii/S0165783617301790?via%3Dihub	2017	González-Irusta and Wright
Landings Data (live weight) by species	https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2021	2016-2020	MMO
The Marine Life Information Network (MarLIN)	https://www.marlin.ac.uk/	2023	MarLIN
National Biodiversity Network (NBN) Atlas	https://nbnatlas.org/	2015	NBN
Survey data/reports available through International Council for the Exploration of the Sea (ICES), including International Herring Larvae Survey (IHLS) and the International Bottom Trawl Survey (IBTS) (North Sea)	https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx https://www.ices.dk/data/dataset-collections/Pages/Fish-trawl-survey.aspx	Ongoing Ongoing	ICES ICES

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
The Shark Trust shark sightings database (for elasmobranchs)	https://www.sharktrust.org/sightings-database	Ongoing	Shark Trust
Salmon Smolt Surveying on the Sunbeam	https://www.bodc.ac.uk/resources/inventories/cruise_inventory/programmes/1419h.pdf	2018	Marine Scotland
UK Protected Sites	https://jncc.gov.uk/our-work/uk-protected-areas/	2023	JNCC
The International Union for Conservation of Nature (IUCN) Red List of Threatened Species	https://www.iucnredlist.org/en	2023	IUCN
Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Coastal, and Marine	https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/	2022	CIEEM
A verified distribution model for the lesser sandeel (*Ammodytes marinus*)	https://spatialdata.gov.scot/geonetwork/srv/api/records/Marine_Scotland_FishDAC_12377	2021	Langton *et al.*
A summary of demersal fish tagging data maintained and published by Cefas	www.cefas.co.uk/publications/techrep/tech135.pdf	2006	Burt *et al.*
FishBase, with special emphasis on the fish of Europe	https://fishbase.se/search.php?region=europe.	2025	FishBase

9.5 Baseline Environment

9.5.1 Fish spawning and nursery grounds

The review of the publicly available data has shown that the waters within the vicinity of the proposed works serve as potential spawning (Figure 9-1, Figure 9-2) and nursery grounds (Figure 9-3,

Figure 9-4) for several commercially and ecologically important species, which include:

- High intensity spawning grounds:
  - None.
- Low intensity spawning grounds:
  - Norway pout (*Trisopterus esmarkii*)
  - Sandeel (*Ammodytes tobianus* / *Ammodytes marinus*); and
  - Whiting (*Merlangius merlangus*).
- Undetermined intensity spawning grounds:

  - Haddock (*Melanogrammus aeglefinus*); and
  - Lemon sole (*Microstomus kitt*).

- High intensity nursery grounds:
  - Anglerfish (*Lophius piscatorius*); and
  - Blue whiting (*Micromesistius poutassou*)

- Low intensity nursery grounds:
  - Atlantic cod (*Gadus morhua*);
  - Common skate (*Dipturus batis*);
  - Hake (*Merluccius merluccius*);
  - Herring (*Clupea harengus*);
  - Ling (*Molva molva*);
  - Mackerel (*Scomber scombrus*);
  - Sandeel;
  - Spotted ray (*Raja montagui*);
  - Spurdog (*Squalus acanthias*); and
  - Whiting.

- Present nursery grounds
  - Haddock;
  - Lemon sole;
  - Norway pout;
  - Saithe (*Pollachius virens*); and
  - Sandeel.

Table 9-2 indicates which months the fish species are likely to use the area for spawning and nursery grounds.

Figure 9-1 Spawning grounds in a radius of 10 km from the Project area.

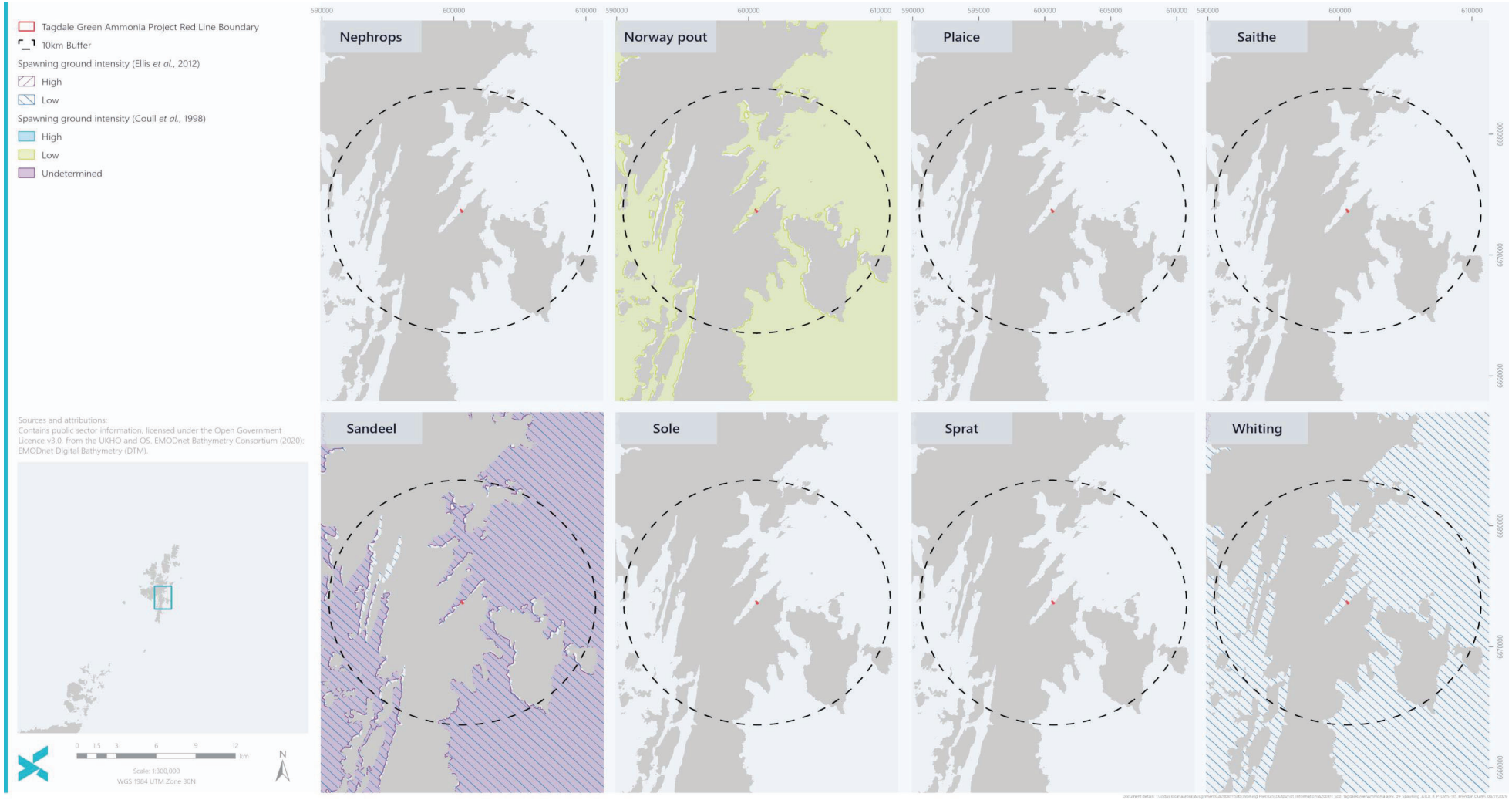

Figure 9-2 Spawning grounds in a radius of 10 km from the Project area.

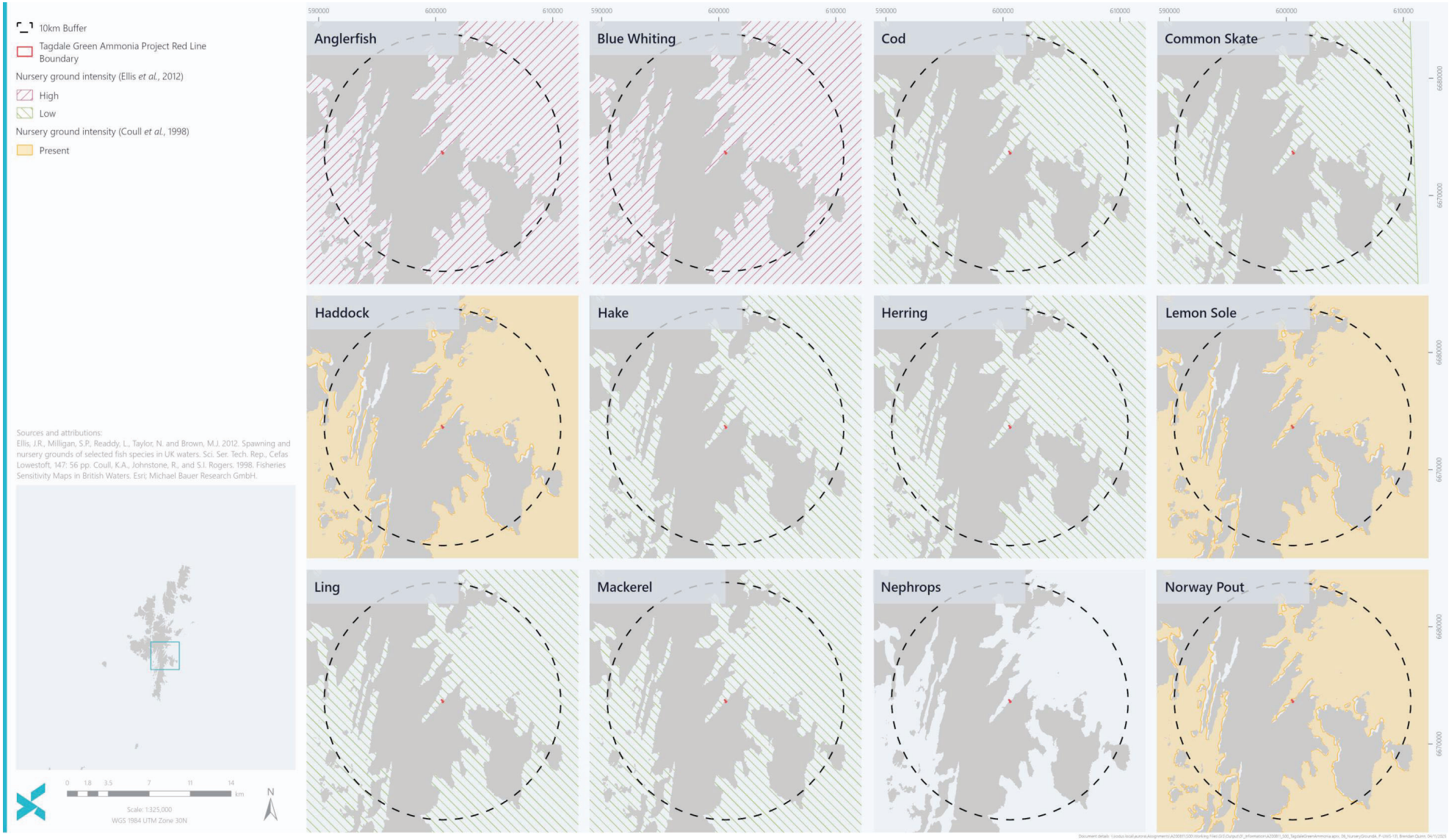

Figure 9-3 Fish nursery grounds within a radius of 10 km from the Project area.

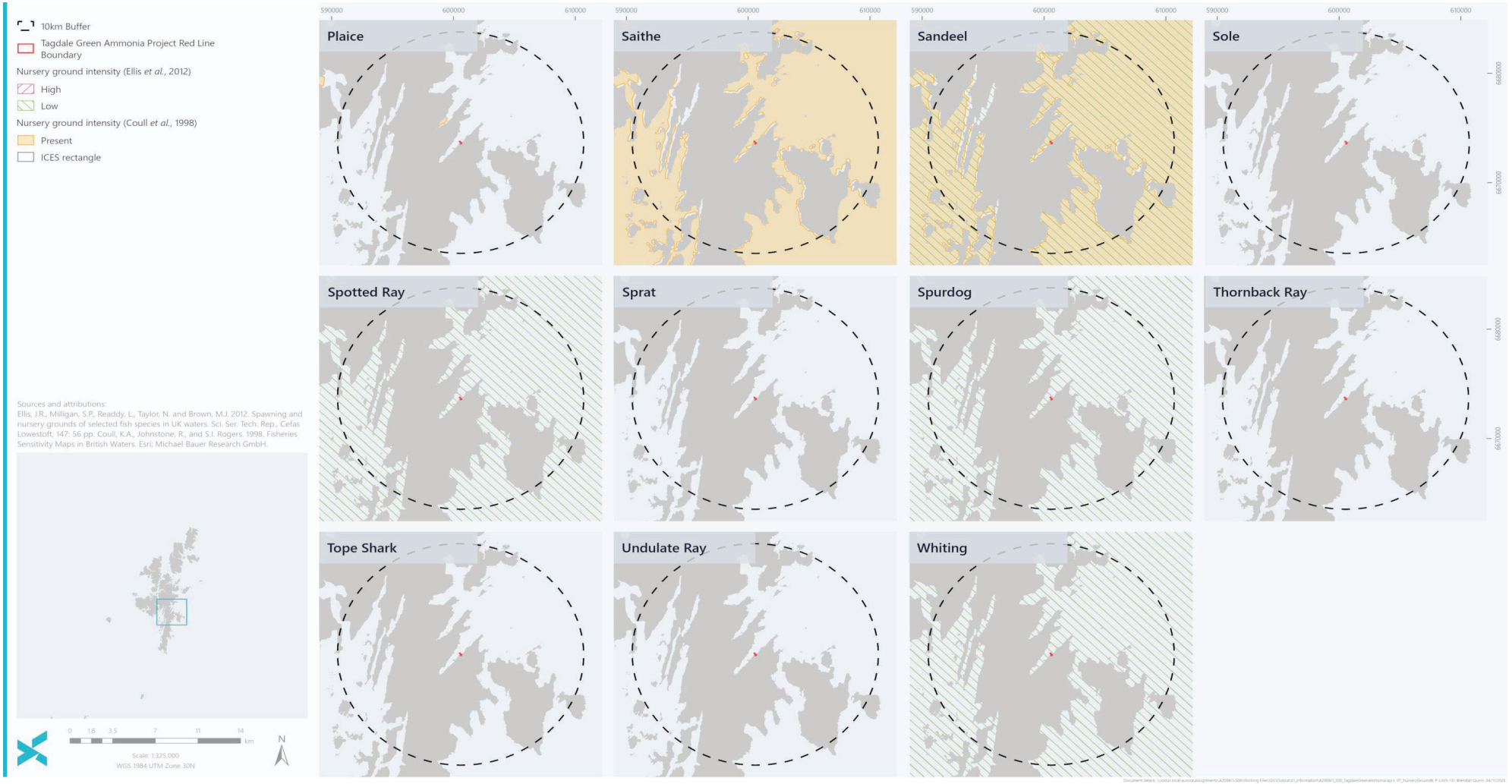

Figure 9-4 Fish nursery grounds within a radius of 10 km from the Project area.

Table 9-2 Spawning and nursery grounds of fish and shellfish species within the vicinity of the Marine Project (Coull et al., 1998; Ellis et al., 2012)

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Anglerfish	N	N	N	N	N	N	N	N	N	N	N	N
Blue Whiting	N	N	N	N	N	N	N	N	N	N	N	N
Cod	N	N	N	N	N	N	N	N	N	N	N	N
Common skate	N	N	N	N	N	N	N	N	N	N	N	N
European hake	N	N	N	N	N	N	N	N	N	N	N	N
Haddock	N	S*N	S*N	S*N	SN	N	N	N	N	N	N	N
Herring	N	N	N	N	N	N	N	SN	SN	N	N	N
Lemon Sole	N	N	N	SN	SN	SN	SN	SN	SN	N	N	N
Ling	N	N	N	N	N	N	N	N	N	N	N	N
Mackerel	N	N	N	N	N	N	N	N	N	N	N	N
Norway Pout	SN	S*N	S*N	SN	N	N	N	N	N	N	N	N
Plaice	S*	S*	S									S
Saithe	N	N	N	N	N	N	N	N	N	N	N	N
Sandeels	SN	SN	N	N	N	N	N	N	N	N	SN	SN
Spotted ray	N	N	N	N	N	N	N	N	N	N	N	N
Spurdog	N	N	N	N	N	N	N	N	N	N	N	N
Whiting	N	SN	SN	SN	SN	SN	N	N	N	N	N	N

S = Spawning
S* = Peak spawning
N = Nursery

Species = High nursery intensity as per Ellis *et al.* (2012)

9.5.2 Potential sandeel habitat

Sandeels are dependent on the seabed for most of their juvenile and adult life cycles and inhabit burrows, except when feeding and spawning (Van Deurs *et al.*, 2011; Tien *et al.*, 2017). Spawning usually occurs in areas with sandy sediments and a high proportion of medium and coarse sand, and a low silt content (Holland *et al.*, 2005; BEIS, 2022). Based on their dependence on the seabed, sandeel are generally considered to be sensitive to disturbance and habitat loss. Sandeels have a high sensitivity to sub-surface abrasion or penetration and a medium sensitivity to surface abrasion (Scottish Government, 2024; FeAST, 2025). Sandeel are thought to have low spawning ground intensity throughout Dales Voe as shown in Figure 9-2 (Ellis *et al.*, 2012).

Reach *et al.* (2024) assign the following sediment types as 'preferred' (i.e. favourable) and 'marginal' (i.e. suitable but less favourable) sandeel habitat:

- *Preferred*: gravelly sand, sand, and slightly gravelly sand; and
- *Marginal:* sandy gravel.

All other sediment types are generally predicted to be unsuitable for sandeels. As discussed in Section 6.5, to the south of Dales Voe, the subtidal zone and prevailing surficial sedimentology is diverse and dominantly comprised of mixed sediments, silt and clay with flints. To the north of Dales Voe surficial sediments are dominantly comprised of sand and muddy sand, silt, clay with flints and coarse sediments. Analysis of sediment grab samples in Dales Voe has shown the presence of a mixture of fine light brown sand with clay, coarse sand from shells and a mixture of possible coral and shell sand. PSD analysis described them as fine sand, medium sand, coarse sand and coarse shelly sand (Envirocentre, 2024). Therefore, it can be assumed that it is likely that Dales Voe may host areas that could be classified as *preferred* sandeel habitat, however based on the foregoing description the likelihood of *preferred* sandeel habitats being present and abundant is considered to be low.

9.5.3 Potential herring habitat

Herring spawn on the seabed and gather in shoals in shallow water (less than 40 m depth) or on offshore banks (up to 200 m depth), in areas of coarse sediments, gravel, and shells, to deposit their sticky eggs (Ellis *et al.*, 2012). Herring spawn once a year, over a short timeframe and newly hatched herring larvae are heavily dependent on the seabed until at least 20 days after they hatch (Russell, 1976).

There are no predicted herring spawning grounds within Dales Voe as shown in Figure 9-1 (Coull *et al.*, 1998; Ellis *et al.*, 2012). Kyle-Henney *et al.* (2024) identify the following sediment types as 'preferred' (i.e. favourable) and 'marginal' (i.e. suitable but less favourable) herring spawning habitat:

- *Preferred*: gravel and sandy gravel; and
- *Marginal*: gravelly sand.

All other sediment types are generally predicted to be unsuitable for herring spawning. Based on the available information regarding the prevailing sediment characteristics in the area (see Section 9.5.2) it is reasonable to assume

that though Dales Voe may host localised areas that are suitable for herring spawning, the likelihood of abundant habitats suitable for herring spawning is considered to be low.

9.5.4 Elasmobranchs

It is likely that elasmobranchs, including spurdog, spotted ray, and common skate, are present within the vicinity of the proposed works.

The common skate species complex includes both flapper skate (*Dipturus intermedius*) and blue skate (*Dipturus flossada*). Flapper skate are distributed across the Northeast Atlantic Ocean, particularly around the British Isles, including the North Sea (McGeady *et al.*, 2022). Both species are categorised as Critically Endangered by the IUCN (Ellis *et al.*, 2024a; Ellis *et al.*, 2024b) However, a distribution model by McGeady *et al*. (2022) indicates that there is higher relative abundance of common skate located in northwest Scotland and low relative abundance around the Shetland Isles indicating that the relative probability of common skate occurring within the area of proposed works is very low.

9.5.5 Shellfish

Nephrops is a lobster which can grow up to 25 cm and is considered to be the most commercially valuable crustacean in Europe (Hill and Sabatini, 2008). The species predominantly inhabits muddy seabed sediments and shows a strong preference for sediments with more than 40% silt and clay (Bell *et al.*, 2013), which determines the distribution of the species. *Nephrops* habitat is managed under Functional Units (FU). The closest FU is FU7 Fladden, which is located to the East of the Shetland Isles and does not overlap with the area of proposed works (Scottish Government, 2025a).

King scallops (*Pecten maximus*) show a habitat preference for clean, firm sand, fine or sandy gravel, and may occasionally be found on muddy sand. There is no clear distribution pattern of scallops (Marshal and Wilson, 2008), but areas with a lower mud composition and a strong current show the greatest abundance. A review of the data shows that there have not been any sampled areas of 'catch-per-hour' data for scallop in the vicinity of the proposed works, however, there are sampled areas in the wider area. Therefore, it is presumed that scallop are likely present within Dales Voe.

As detailed in Section 12.5, other shellfish species that are likely to be present in the area and are commercially important include European lobster (*Homarus gammarus*) and brown crab (*Cancer pagurus*) (Scottish Government, 2025a).

9.5.6 Diadromous fish

Diadromous fish migrate between freshwater and marine environments to fulfil their lifecycle. In general, the migration pathways that some diadromous fish species follow, are poorly understood. A review of the datasets available in Scottish Government (2025a) show that there are no Scottish Salmon Rivers where wild salmon (*Salmo salar*) are present, that lead into Dales Voe. Therefore, it can be determined that salmon, and potentially other diadromous fish, including brown trout (*Salmo trutta*), European eel (*Anguilla anguilla*) and lamprey species are not present within the vicinity of the proposed works.

9.5.7 Designated sites

The Project's site falls within the Dales Voe Shellfish Water Protected Area (SEPA) (Figure 12-1).

9.6 Embedded Mitigation Proposed

Certain measures have been proposed as part of the Project development process in order to reduce the potential for impacts to the environment. These measures will follow best practice and are described as follows:

- Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a MPCP, biosecurity assessment and waste management plan.

9.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on fish and shellfish receptors during the construction phase:

- Disturbance or damage to sensitive species due to underwater sound generated from piling activities and vessels;
- Temporary habitat loss or disturbance due to seabed preparation activities, anchors / spud legs of vessels; and,
- Temporary increases in SSCs and potential sedimentation / smothering on fish and shellfish.

The following Marine Project activities have the potential to impact on fish and shellfish during the operation and maintenance phase:

- Disturbance or damage to sensitive species due to underwater sound generated by vessels; and,
- Long-term habitat loss due to the presence of jetty and moorings on the seabed.

9.8 Scoping of Impacts

Several potential impact pathways have been identified which may impact on fish and shellfish during the construction, operation and maintenance phases of the Marine Project. These impacts are outlined, together with a justification for scoping them in, or out, of the EIA within Table 9-3.

Table 9-3. Potential Impacts on fish and shellfish ecology during Construction, Operation and Maintenance phases of the Project.

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Disturbance or damage to sensitive species due to underwater sound generated from construction and decommissioning activities	Construction	High intensity nursery grounds for blue whiting are found within the Study Area for fish and shellfish. Blue whiting belongs to the group of species whose swim bladder is involved in hearing (primarily sound pressure detection) (Popper *et al.*, 2014); therefore, they are sensitive to the impacts of underwater noise from activities in relation to jetty construction (e.g. piling). Sound pressures and particle motion can have pronounced impacts on the swim bladder of these species which is closely connected to the ear, and these "hearing specialists" show a more extended hearing range of up to 500 Hz (Popper *et al.*, 2019). During construction, vessel activity will introduce continuous sound into the surrounding environment. However, fish are not considered to be sensitive to vessel noise. Piling will be required during construction. Therefore, there may be a potential impact on fish due to the introduction of sound to the marine environment.	Scoped in
Disturbance or damage to sensitive species due to underwater sound generated during the operation and maintenance phase	Operation & Maintenance	Based on the location of the project and the ambient noise generated from local fishing and shipping activities, the operation and maintenance phase of this Marine Project is not likely to form a major contribution to the soundscape. No impacts on fish are expected due to the introduction of operational sound to the marine environment.	Scoped out
Temporary habitats loss or disturbance during the installation of jetty and moorings	Construction	There is low probability that the Marine Project overlaps with the spawning and nursery grounds of sandeels, and herring while it overlaps with the nursery grounds of blue whiting. Disturbance from seabed preparation activities, anchors and spud legs from vessels is likely to be temporary and localised and	Scoped in

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
		may occur during the construction of the jetty and moorings on the seabed. There is limited site-specific information about the presence of spawning grounds (e.g. elasmobranchs) in the vicinity of the operations. The impact pathway is scoped in for further assessment in the EIA.	
Long-term habitat loss due to the presence of the jetty and moorings	Operation & Maintenance	The extent of long-term habitat loss will be highly localised. Given the highly localised footprint of the jetty and moorings, it is unlikely that this long-term habitat loss could generate a significant level of disturbance to fish and shellfish receptors.	Scoped out
Temporary increases in SSCs and potential sedimentation / smothering on fish and shellfish	Construction	Increased sedimentation associated with construction work may lead to localised changes in sediment type which may potentially impact seabed dependant species (e.g., sandeel and herring) through smothering. However due to the small, localised area, any increased sedimentation is likely to be minimal. It is worth considering that commercial fishing takes place in this region, and has impacts across a much greater spatial scale than the construction, installation of a single jetty and moorings.	Scoped out
Temporary increases in SSCs and potential sedimentation / smothering on fish and shellfish	Operation & Maintenance	The nature of the works associated with the operation and maintenance phase activities and the discrete area within which these activities will be undertaken, will result in significantly lower SSCs than those associated with construction activities. For this reason, this impact has been scoped out for further assessment within the EIA Report.	Scoped out

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Long term habitat loss due to presence of jetty and moorings on the seabed and associated scour protection	Operation & Maintenance	The footprint of jetty and moorings will be highly localised. The extent of this habitat loss will not have a significant impact on fish or shellfish habitat when considered at the scale of fish spawning and nursery grounds.	Scoped out
Impact to habitats or species as a result of pollution or accidental discharge	Construction, Operation & Maintenance	Accidental release of oil and fluid emissions from Project vessels. The magnitude of an accidental spill incident from Project vessels is limited by the size of chemical or oil inventory on such vessels. Embedded mitigation measures will be adopted to ensure that the potential for accidental release of pollutants is limited, including strict controls on vessel activities and procedures. For these reasons, the impacts of pollution or accidental discharge to fish and shellfish ecology receptors has not been considered further.	Scoped out
Fish aggregation around the jetty and moorings	Operation & Maintenance	Marine infrastructure may act as a Fish Aggregation Device (FAD), offering a refuge area for some fish and shellfish species. Although relatively little is known about this impact, it is unlikely that this aggregation of fish around novel structures will represent a significant change to the environment within the Study Area due to the relatively small scale of the Project.	Scoped out

9.9 Approach to Analysis and Assessment

The EIA will consider and present relevant information from across the ICES rectangle where this Marine Project is located (49E8). This ICES rectangle will form the basis of the fish and shellfish ecology Study Area.

ICES catch data will be assessed at this stage to further qualify local fish and shellfish populations across the Study Area.

9.9.1 Site-specific survey recommendations

The habitats encountered in the area of proposed works also support a diversity of fish species. Evidence has shown that the area of proposed works and its vicinity support a diversity of fish species including elasmobranchs (such as flapper skate). It is recommended that benthic habitat assessment surveys take place including the assessment of elasmobranch presence and spawning sites e.g. egg cases laid on seabed.

9.10 Summary

The Fish and Shellfish topic will be addressed within the EIA. The following impacts are scoped in for further assessment:

- Disturbance or damage to sensitive species due to underwater sound generated from construction and decommissioning activities (construction phase);
- Temporary habitats loss or disturbance during the installation of jetty and moorings (construction phase).

10 MARINE MAMMALS AND OTHER MEGAFAUNA

10.1 Introduction

This chapter provides an overview of the sensitivities associated with marine mammal[13] receptors relevant to the Marine Project. An overview of the potential impacts of the Marine Project on marine mammals, including during the construction, operation and maintenance phases of the Project, are also discussed.

10.2 Legislation, Policy and Guidance

In addition to the relevant policy and legislation described in Section 4 the following section outlines the legislation, policy and guidance that will be taken into consideration during the assessment of the potential impacts on marine mammal receptors for the Marine Project.

10.2.1 Legislation and Policy

The following legislation and policies are considered relevant:

- WCA 1981;
- Nature WEI Conservation (Scotland) Act 2004;
- Scotland's NMP. General Policy 9. The Scottish Government, 2015. "Natural heritage: Development and use of the marine environment must:
    - Comply with legal requirements for protected areas and protected species;
    - Not result in significant impact on the national status of PMFs;
    - Protect and, where appropriate, enhance the health of the marine area.
- Shetland Islands Regional Marine Plan (2025).
    - MP NOISE1: Minimising Levels of Surface and Underwater Noise and Vibration:
        - Proposals for marine development and use should consider the effects of man-made surface and underwater noise and vibration on the marine environment, species, and people, including the potential cumulative effects. Proposals should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects. Where significant adverse impacts are identified, applicants may be required to: a) submit a surface and underwater noise and vibration impact assessment or supporting information to describe the duration, type and level of noise and vibration expected to be generated at all relevant stages of the development (construction, operation, decommissioning); and b) identify mitigation measures to minimise the adverse impacts associated with the duration and level of noise and vibration activity. Where this includes a EPS, note that an EPS Licence may be required. Consideration of impacts on PMFs may also be required.
    - Policy MP BIOD1: Protected Sites and Species:

[13] *For the purpose of this report, marine mammals is defined as large, highly mobile and potentially migratory species which have been identified in waters around Shetland. The term 'megafauna' is used to capture non-mammalian large sized fauna such as marine turtles.*

- Proposals for marine development and use must comply with all legal requirements for protected areas and protected species, and should consider potential direct and indirect effects, including disturbance and any cumulative impacts.
- Internationally Designated Sites: Proposals that may affect a European Site (SACs and SPAs) must comply with the relevant legislation and will only be supported where they meet the relevant statutory tests. All Ramsar sites are also European Sites and/or SSSIs and are extended protection under the relevant statutory regimes.
- Nationally Designated Sites: Proposals that could affect Nature Conservation MPAs or Demonstration and Research MPAs must comply with the relevant legislation for these protected areas. Proposals that could affect a SSSI or National Nature Reserve must comply with the relevant legislation for these protected areas.
- Seal Haul-Out Sites: Proposals that could affect a designated seal haul-out site should consider how they will avoid harassment of seals. Applicants should have regard to the Harassment at Seal Haul-Out Sites: Guidance.
- Local Nature Conservation Sites: Proposals that could affect a site designated as a LNCS should have regard to Shetland Islands Council's Local Development Plan and its Supplementary Guidance on LNCS.
- Protected Species: Proposals for marine development or use that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present, or may be affected by a proposal, steps must be taken to establish their presence. Applicants should consider within the planning and design of the proposal the level of protection afforded by legislation and should fully consider any impacts to protected species.

- Policy MP BIOD2: PMFs:
  - Proposals must not result in significant negative impacts on the national status of PMFs. Applicants should consider if impacts will affect PMFs in Shetland. Applicants should consider mitigation measures, including alternative locations, where potential adverse impacts on PMFs are identified.
- Policy MP BIOD4: Furthering the Conservation of Biodiversity
  - Development and use of the marine environment must protect and, where appropriate, enhance the health of Shetland's marine area so far as is consistent with the exercise of functions relating to the proposed development or use. Where proposals may have a significant adverse effect on biodiversity or the ecosystem services of biodiversity, including any cumulative impact, the applicant should further consider measures to avoid, minimise, or mitigate any harm or disturbance to the ecosystem services, continuity, and integrity of the habitats or species affected. Applicants should consider impacts on areas which are important to all aspects of a species' life cycle including locations used for breeding, nesting, resting, foraging and seasonal use, including overwintering.

10.2.2 Guidance

The following guidance are considered relevant:

- PMFs (NatureScot, 2020a);
- The UK Post-2010 Biodiversity Framework and the Scottish Biodiversity Strategy: Revised Implementation Plan (2018-2020) (JNCC, 2018);
- Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects (Southall *et al.*, 2019);
- Environmental Impact Assessment Handbook (SNH, 2018);
- Scottish Marine Wildlife Watching Code (SNH, 2017);
- The protection of Marine European Protected Species from injury and disturbance: Guidance for Inshore Waters (July 2020 Version) (Marine Scotland, 2020a);
- Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010); and
- The Basking Shark Code of Conduct (Shark Trust, 2020).

10.3 Study Area

The marine mammal and megafauna study area encompasses the proposed Project area and a 50 km buffer zone around the Project (Figure 6-2).

10.4 Data and Information Sources

Publicly available datasets and literature used in this Scoping Assessment are shown in Table 10-1.

Table 10-1 Summary of key sources of marine mammal and turtle information for assessment

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the Small Cetaceans in the European Atlantic and North Sea (SCANS) -IV aerial and shipboard surveys	https://www.tiho-hannover.de/fileadmin/57_79_terr_aqua_Wildtierforschung/79_Buesum/downloads/Berichte/20230928_SCANS-IV_Report_FINAL.pdf	2023	Gilles *et al.*
Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys	https://scans3.wp.st-andrews.ac.uk/files/2021/06/SCANS-III_design-based_estimates_final_report_revised_June_2021.pdf	2021	Hammond *et al.*

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Modelled density surfaces of cetaceans in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys	https://scans3.wp.st-andrews.ac.uk/files/2022/08/SCANS-III_density_surface_modelling_report_final_20220815.pdf	2022	Lacey *et al.*
Distribution Maps of Cetacean and Seabird Populations in the North-East Atlantic	https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13525	2019	Waggitt *et al.*
Updated habitat-based at-sea distribution maps for harbour and grey seals in Scotland. Sea Mammal Research Unit (SMRU), University of St Andrews, Commissioned Report to Scottish Government.	https://tethys.pnnl.gov/publications/updated-habitat-based-sea-distribution-maps-harbour-grey-seals-scotland	2025	Carter *et al.*
Sympatric seals, satellite tracking and protected areas: habitat-based distribution estimates for conservation and management.	https://www.frontiersin.org/articles/10.3389/fmars.2022.875869/full	2022	Carter *et al.*
Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/959723/SMRU_2020_Habitat-based_predictions_of_at-sea_distribution_for_grey_and_harbour_seals_in_the_British_Isles.pdf	2020	Carter *et al.*
Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management	https://www.frontiersin.org/articles/10.3389/fmars.2022.875869/full	2020	Carter *et al.*
Scientific Advice on Matters Related to the Management of Seal Populations	http://www.smru.st-andrews.ac.uk/files/2022/08/SCOS-2021.pdf	2021	Special Committee on Seals (SCOS)
Regional Baselines for Marine Mammal Knowledge Across the North Sea and	https://data.marine.gov.scot/sites/default/files//Scottish%20Marine%20and%20Freshwater%20Science%20%28SMFS%29%20Vol%2011%20No%2012_%20Regional%20baselines%20for%20marine%20mam	2020	Hague *et al.*

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Atlantic Areas of Scottish Waters	mal%20knowledge%20across%20the%20North%20Sea%20and%20Atlantic%20areas%20of%20Scottish%20waters%20-%20Appendix%201%20Data%20Sources.pdf		
Harbour seal and grey seal distribution maps	Method for analysis of telemetry data and high-level interpretation. https://www.gov.scot/publications/updated-habitat-based-sea-distribution-maps-harbour-grey-seals-scotland/pages/4/	2016	Band *et al.*
Updated abundance estimates for cetacean Management Units in UK waters (Inter-Agency Marine Mammal Working Group (IAMMWG)	https://hub.jncc.gov.uk/assets/f07fe770-e9a3-418d-af2c-44002a3f2872	2022	IAMMWG
SAC Scotland ESRI	https://www.nature.scot/professional-advice/protected-areas-and-species/protected-areas/international-designations/european-sites/special-areas-conservation-sacs	2020b	NatureScot
NBN Atlas	https://nbnatlas.org/	2015	NBN
NBN Atlas	https://nbnatlas.org/	2015	NBN
Joint Cetacean Data Programme (JCDP) data portal	https://www.ices.dk/data/data-portals/Pages/Cetaceans.aspx	Ongoing	JNCC
Basking sharks in the northeast Atlantic: spatio-temporal trends from sightings in UK waters	https://doi.org/10.3354/meps09737	2012	Witt *et al.*

10.5 Baseline Environment

10.5.1 Cetaceans

Overall, 15 species of cetaceans have been observed in Shetland, however, only five are year-round residents (the other species are considered seasonally migratory, deep-water species or rare visitors (Shucksmith, 2017)), including:

- killer whale (*Orcinus orca*);
- minke whale (*Balaenoptera acutrostrata*);

- white-beaked dolphin (*Lagenorhynchus albirostris*);
- harbour porpoise (*Phocoena phocoena*); and,
- Risso's dolphin (*Grampus griseus*).

The Small Cetaceans in the European Atlantic and North Sea (SCANS) -IV surveys (Gilles *et al.*, 2023) suggests that four[14] of the five year-round species were observed within block NS-E which represents Shetland including Risso's dolphin, white-beaked dolphin, minke whale and harbour porpoise. The results from the SCANS-IV survey indicated that Atlantic white-sided dolphin (*Lagenorhynchus acutus*) were also present within the block NS-E. The following provides a description of these species, including their density (animals/km^2) and abundance:

- Harbour porpoises are resident and abundant year-round in Scottish waters and throughout the UK and are widely distributed in shelf water around Shetland with numbers peaking during the summer months (Hague *et al.*, 2020). Harbour porpoises are the most abundant cetacean species in block NS-E with an abundance of 33,735 individuals and a density of 0.52 animals/km^2 (Gilles *et al.*, 2023);
- White-beaked dolphins are also resident and abundant year-round in Scottish waters (Hague *et al.*, 2020) and are the second-most abundant cetacean species recorded within NS-E with an abundance of 11,611 individuals and a density of 0.18 animals/km^2 (Gilles *et al.*, 2023);
- Risso's dolphins are common in deeper, offshore waters (Hague *et al.*, 2020) and are typically observed during the summer months from June to September. The density of Risso's dolphin in block NS-E is approximately 0.07 animals/km^2, with an abundance of 4,589 individuals (Gilles *et al.*, 2023);
- Atlantic white-sided dolphins have been sighted on the south coast of Shetland (Hebridean Whale and Dolphin Trust (HWDT), 2018) and typically travel in social groups of up to 30 individuals. The density of Atlantic white-sided dolphin in block NS-E is approximately 0.015 animals/km^2, with an abundance of 958 individuals (Gilles *et al.*, 2023); and
- Minke whales are the smallest, most abundant baleen whale to be sighted in Scottish waters (HWDT, 2018). The density of minke whale in block NS-E is approximately 0.01 animals/km^2, with an abundance of 795 individuals (Gilles *et al.*, 2023).

10.5.2 Seals

Two pinniped (seal) species regularly occur in the Scottish offshore and coastal environment: grey seals and harbour seals. Both grey and harbour seals are listed under Annex II of the Habitats Directive and are PMFs. Approximately 36% of the world's grey seals breed in the UK (of these, 81% breed at colonies in Scotland). Harbour seals are also widespread around Shetland (SCOS, 2022), with Dales Voe being an important habitat for harbour seal which has a declining population status (Carter *et al.*, 2025).

Similar to seabirds, seals are central-place foragers, utilising a terrestrial 'base' for important life history events (i.e., breeding, pupping, moulting, etc.) and to rest, and then undertake foraging trips at sea before returning to land (Carter *et al.*, 2025). While both species are associated with shallower shelf waters, grey seals often make longer foraging trips to deeper waters than harbour seals.

[14] *Too few killer whales were sighted to be able to determine abundance.*

There is evidence to suggest that variations in activity from haul out sites is influenced by the sex of the animal, with female harbour seals spending a greater time hauled out between June and September, and less time hauled out between October and May (Cunningham *et al.*, 2009).

Grey seals forage in the open sea and return regularly to land to rest, moult and breed (SCOS, 2022). Grey seals can forage at significant distances from their haulout sites, with evidence suggesting that animals can travel over 100 km from land for periods of between 1 and 30 days. However, there is further evidence of seal tracking data recording grey seals feeding several hundred kilometres offshore (Carter *et al.*, 2022).

The density of harbour seals and grey seals within a radius of 10 km from the Project area can be seen in Figure 10-1.

There are no seal haul-out site located in close proximity (< 1 km) to the proposed works. The closest seal haul-out site is the Holm of Beosetter and is found at a distance of 4.9 km.

10.5.3 Otters

The European otter is a semi-aquatic mammal which inhabit riverine, brackish and coastal environments throughout the UK. Otters depend on both freshwater and marine environments for food (NatureScot, 2025b; BEIS, 2022). The coastal areas in the Shetland marine area provide a suitable habitat for otters, and the species is prevalent on the islands (Findlay *et al.*, 2015). The otter population in Shetland is one of the most intensely studied in Europe. The European otter is listed as EPS under Annex IV of the Habitats Directive and are listed as PMFs (Tyler-Walters *et al.*, 2016; BEIS, 2022). The European otter is also currently protected under Annex II of the EU Habitats Directive (BEIS, 2022). In the vicinity of the proposed works, there is no accepted otter holts (NBN Atlas, 2025).

As otters and their holts are land-based and are therefore species which typically reside above MHWS, they are not considered further within this Scoping Report.

10.5.4 Marine turtles

Sightings of marine turtles within UK waters are rare, with leatherback turtles (*Dermochelys coriacea)* the most commonly sighted species (NBN Atlas, 2020). In Scotland, marine turtle sightings are primarily focused in the seas off the west of Scotland. Sightings have also occurred in and around the Firth of Forth area on the east coast of Scotland and in small numbers in the Orkney and Shetland Islands. However, marine turtles are typically considered to be rare and occasional visitors and thus any interaction between marine turtles with the proposed Marine Project is considered unlikely. Consequently, marine turtles have been scoped out of further assessment in the EIA.

10.5.5 Basking sharks

Basking sharks (*Cetorhinus maximus*) are protected under Schedule 5 of the WCA 1981 which prohibits the killing, injuring, or taking by any method of those wild animals listed on Schedule 5 of the WCA 1981. The Nature Conservation (Scotland) Act 2004, Part 3 and Schedule 6 make amendments to the WCA 1981, strengthening the legal protection for threatened species to include 'reckless' acts, and specifically makes it an offence to intentionally or recklessly disturb or harass basking sharks. Basking sharks are primarily sighted in western Scotland and are only

very rarely present around Shetland (Paxton *et al.*, 2014), and thus it considered there is extremely limited potential for the proposed installation activities to result in disturbance or harassment of this species. Consequently, basking sharks have been scoped out of further assessment in the EIA.

10.5.6 Designated sites

A review of the datasets show that the following relevant designated sites are located within a radius of 50 km from the Projects' site (Table 10-2, Figure 6-2).

Table 10-2 Sites designated for the protection of grey seals and harbour seals

SITE NAME	DISTANCE (km)	FEATURES
Mousa SAC	24.7	Harbour seal (*P. vitulina*)
Mousa SSSI	25.3	Harbour seal (*P. vitulina*)
Yell Sound Coast SAC	30.7	Harbour seal (*Phoca vitulina*)
North Fetlar SSSI	48.4	Grey seal (*Halichoerus grypus*); harbour seal (*P. vitulina*)

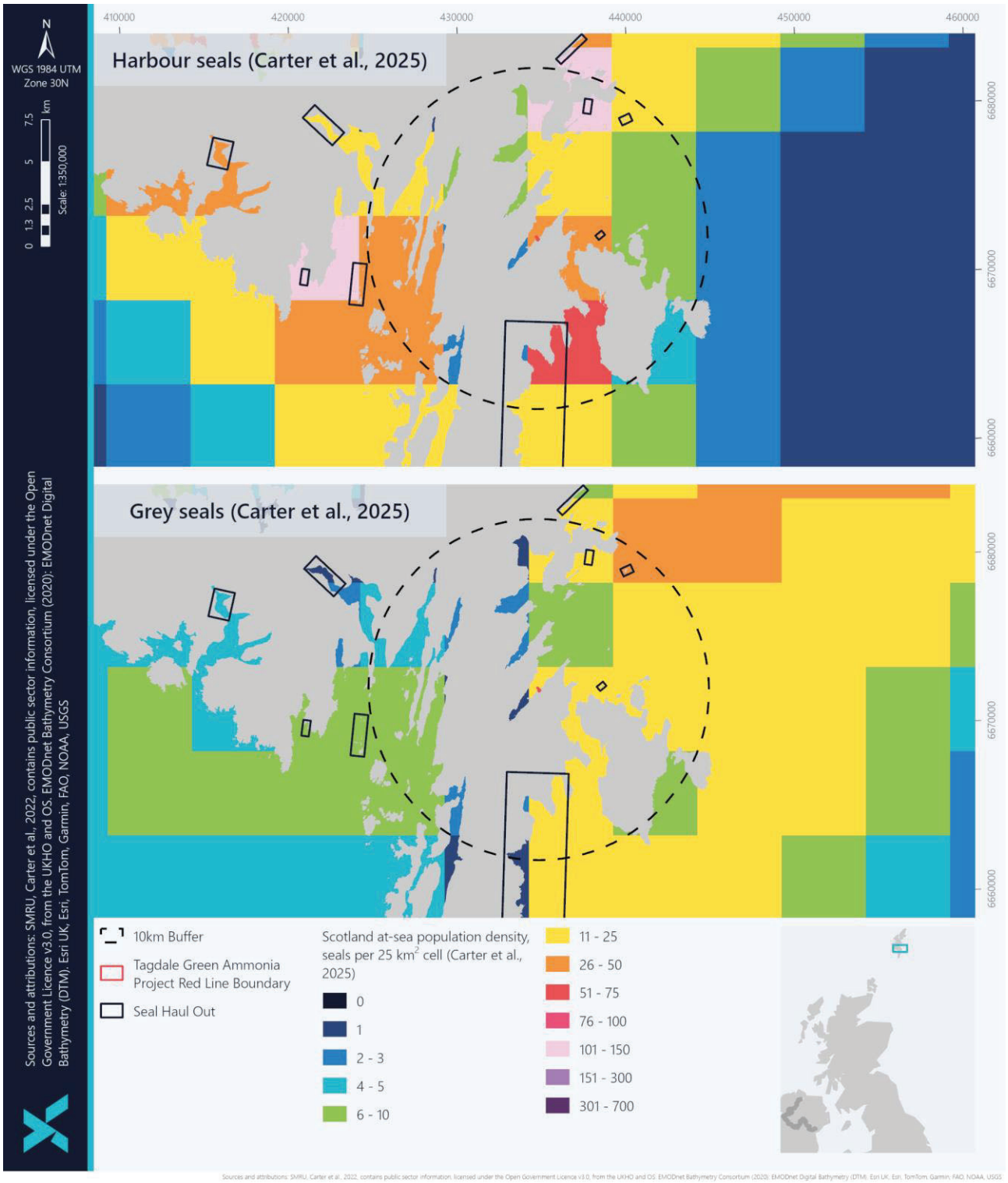

Figure 10-1 Density of harbour seals and grey seals within radius of 10 km from the Project area

10.6 Embedded Mitigation Proposed

Certain measures have been proposed as part of the Marine Project development process in order to reduce the potential for impacts to the environment. These measures will follow best practice and are described as follows:

- Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a MPCP, biosecurity assessment and waste management plan;
- Adherence to the Scottish Marine Wildlife Watching Code (SNH, 2017) (e.g. vessels will be travelling at slow speeds during construction and operation and maintenance activities);
- Development and adherence to a Piling Strategy (if required) which delineates the noise mitigation measures to be implemented during any piling activities (e.g., soft-start and ramp-up procedures) to reduce the risk of injury to negligible levels; and,
- Marine Mammal Mitigation Protocol (MMMP) for pile driving, (if required) will be implemented.

The requirement for additional mitigation measures (secondary mitigation) will be dependent on the significance of the effects on marine mammal receptors and will be consulted upon with consultees throughout the EIA process. This will be informed by the underwater noise modelling and EIA, and may include soft start of piling equipment and/or use of Marine Mammal Observers.

10.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on marine mammals during the construction phase:

- Noise related impacts to marine mammals associated with construction activities e.g. piling and vessels. Marine mammals are sensitive to noise and vibration as they use sound for communication, navigation and detection of prey;
- Indirect impacts on marine mammals associated with changes in availability of mammal's prey (e.g. underwater noise disturbance from piling to fish populations on which mammals prey);
- Vessel disturbance;
- Risk of injury resulting from collision of marine mammals with vessels to be used in the construction phase; and,
- Impacts associated with effects on marine water quality e.g., mobilisation of sediment contaminants during seabed preparation or jetty/moorings installation.

The following Marine Project activities have the potential to impact on marine mammals during the operation and maintenance phase

- Noise related impacts to marine mammals associated with operation e.g. vessel for the transportation of ammonia;
- Indirect impacts on marine mammals associated with changes in availability of mammal's prey (e.g. underwater noise disturbance from vessels on which mammals prey);
- Vessel disturbance;

- Risk of injury resulting from the collision of marine mammals with the jetty;
- Risk of injury resulting from collision of marine mammals with vessels used in the operation and maintenance phase e.g. vessel used for the transportation of ammonia;
- Displacement or barrier effects (exclusion from habitat) resulting from the presence of the jetty and moorings;
- Impacts associated with release of contaminants in the marine environment from vessels; and,
- Long-term habitat change (including the potential for change in foraging) due to the presence of jetty and moorings)

10.8 Scoping of Impacts

The potential impacts of the Marine Project on marine mammals have been summarised in Table 10-3. The table identifies potential impacts during the construction and operation and maintenance phases of the Marine Project, with a scoping justification and scoping decision provided.

Table 10-3 Potential Impacts on Marine Mammals during Construction, Operation and Maintenance phases of the Project

POTENTIAL IMPACT	PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED IN/OUT
Noise-related impacts to marine mammals associated with construction/ operational/ noise, including the risk of injury and disturbance/displacement	Construction	There will be underwater noise from piling during construction. Evidence suggests that potential impacts include short term or temporary displacement of mammals. The impacts of underwater noise to protected species will require further consideration.	Scoped in
	Operation & Maintenance	Based on the location of the Project and the ambient noise generated from local fishing and shipping activities, the operation and maintenance phase of the Marine Project is not likely to surpass existing ambient noise. In addition, the frequency of visits to the site from the marine vessel for the transportation of the ammonia will be low i.e. every 15 weeks. As such this impact has been scoped out.	Scoped out
Indirect impacts of construction noise on the prey species of marine mammals	Construction	Underwater noise disturbance to fish populations (as prey species of marine mammals) generated during jetty and mooring construction may indirectly impact marine mammal species. However, the scale of these impacts is expected to be limited for jetty/mooring installation activities and for piling. There is also extensive alternative foraging habitat available for marine mammals within, or proximal to Dales Voe. The impacts of underwater noise to prey species of marine mammals are therefore not scoped in for further consideration.	Scoped out
	Operation & Maintenance	Based on the location of the Marine Project and the ambient noise generated from local fishing and shipping activities, the operation and maintenance phase of the Project is not likely to surpass existing ambient noise. As such this potential impact has been scoped out.	Scoped out
Vessel disturbance	Construction	Relatively high levels of vessel traffic (passenger, cargo and other vessel activities) within the area form part of the existing baseline. The number of construction vessels or material transport vessels/trips used in the construction phase is not yet known. Increased vessel traffic during construction may increase the risk of short-term, temporary and reversible disturbance to marine mammals; however the operations during these stages will be temporary and limited to a specific area. In the terrestrial scoping report for the Project (WSP, 2026) it is mentioned that marine	Scoped out

POTENTIAL IMPACT	PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED IN/OUT
		vessels are expected to be required to import construction materials and plant for construction of the on-site buildings and infrastructure, including the electrolyser building, substation and grid connections, hydrogen purification plant, demineralization plant, ammonia plant, storage tanks, and overland pipeline. Regardless, increase in vessel noise during construction is not expected to be significant. There are no designated seal haul-outs in the vicinity of construction works, the nearest being Holm of Beosetter, which lies outside Dales Voe at a distance of circa 5 km from the Marine Project. As such, vessel disturbance during the construction phase has been scoped out.	
	Operation & Maintenance	The small number of vessels required for operation and maintenance activities is unlikely to generate an increase in disturbance against the existing baseline of shipping activity. The frequency of visits of the vessel for the transportation of ammonia will be low i.e. once every 15 weeks. As such vessel disturbance during operation and maintenance has been scoped out.	Scoped out
Risk of injury resulting from collision of marine mammals with vessels in support of installation, maintenance or operational activities.	Construction, Operation & Maintenance	It is not expected that increased localised vessel traffic associated with the Project will increase the risk of collision to marine mammals within the area. Vessel operations will adhere to good environmental practice, i.e. the Scottish Marine Wildlife Watching Code when operating around/near to marine mammals. Following relevant (activity-specific) guidance to minimise the risks of injury to marine mammals during the construction, operation and maintenance phases of the Marine Project.	Scoped out
Impacts associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity	Construction	Activities related to the construction of the Marine Project may influence water quality as a result of sediment disturbance. These impacts are localised and short-lived and anticipated to be of low magnitude. Marine mammals often migrate through waters where conditions are turbid for extended periods without significant impacts to species biology or behaviour. For this reason, localised, temporary changes to water quality will not have a significant impact on marine mammals.	Scoped out

POTENTIAL IMPACT	PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED IN/OUT
Risk of injury resulting from collision of marine mammals with jetty / moorings	Operation & Maintenance	The area of the submerged (static) jetty and moorings is small when compared to the wider available marine environment. It is expected that the potential risk of injury will be limited and therefore this has been scoped out.	Scoped out
Displacement or barrier effects resulting from the physical presence of devices and infrastructure	Operation & Maintenance	The introduction of new infrastructure into the marine environment can potentially result in displacement or exclusion from habitats. However, considering the highly localised footprint of the jetty and moorings and their location within Dales Voe their added presence is not likely to significantly further increase physical disturbance/displacement beyond the current baseline. As such this potential impact has been scoped out.	Scoped out
Impacts associated with effects upon marine water quality due to any accidental release of pollutants	Operation & Maintenance	The accidental release of pollutants is limited to oils and fluids contained within the vessels. The potential for full inventory release from a vessel is considered extremely remote limiting the scale of any potential interactions between pollutants and marine mammals. Embedded project mitigations established for both the Marine Project and on vessels operating in association with the Marine Project, will also further reduce the likelihood of spillages occurring. For this reason, this potential impact has not been considered further.	Scoped out
Long-term habitat change, including the potential for change in foraging opportunities	Operation & Maintenance	Changes in prey abundance and distribution resulting from operation and maintenance activities on prey species may impact foraging success for marine mammals. However, considering the relatively small size of the jetty and the relatively small number of moorings their added presence is not likely to increase long term habitat change and foraging changes for species. As such this potential impact has been scoped out.	Scoped out

10.9 Approach to Analysis and Assessment

The assessment of potential impacts on cetaceans will be largely qualitative (other than quantitative underwater sound modelling), given the absence of data on which to base a quantitative assessment[15]. The assessment will focus on the likelihood of impacts on harbour porpoise, Risso's dolphin, killer whale, harbour seal and grey seal. Appropriate and relevant mitigation measures will be proposed to avoid or minimise impacts. The data sources identified in Section 10.4 will be used to characterise the existing environment and species baselines for marine mammals within the Project. The potential impacts identified in Section 10.8, in conjunction with expert judgement and consultation will be used to inform the EIA Report. Consultation will be undertaken with key stakeholders including Marine Directorate, NatureScot, and the Whale and Dolphin Conservation and other relevant stakeholders who may be able to provide useful information include UHI Shetland and the Sea Watch Foundation.

As piling will be one of the construction methods, underwater noise propagation modelling will be undertaken to inform the assessment. This modelling will use a method appropriate for shallow waters to assess the range of potential impacts (including auditory injury, temporary hearing threshold shift and disturbance) on marine mammal receptors, defined by NMFS (2024) hearing groups (e.g., low-frequency, mid-frequency, very high frequency cetaceans; phocid seals in water). Source sound pressure levels relevant to the type of pile being installed will be taken from relevant literature, e.g., Caltrans (2015; 2020).

Protected sites designated for the conservation of marine mammal features (SACs and NCMPAs) will be considered within the Report to Inform the Appropriate Assessment (RIAA) which will be completed alongside the EIA Report. The EIA Report chapter will also discuss the potential impacts of the Marine Project on the protected sites. Due to the distance of the Marine Project to sites designated for the conservation of cetaceans impacts are anticipated to be highly limited with the focus likely to be on sites with seal (particularly harbour seal) qualifying interests, e.g. Mousa SAC; Yell Sound Coast SAC.

10.9.1 Site-specific survey requirements

Despite there being only limited data sources that provide relevant cetacean data (e.g. citizen science records such as the Shetland Biological Records Centre - SBRC), suitable to use for impact assessment purposes. It is considered that a dedicated campaign of marine mammal (including seal) (at sea) surveys would be disproportionate to the impacts which may occur as a result of the Marine Project, which are typical of coastal construction activities. Consequently, no site surveys are proposed.

10.10 Summary

The Marine Mammals and Other Megafauna topic will be addressed within the EIA. The following impact is scoped in for further assessment:

[15] *The location of the works within Dales Voe means regional-scale survey data such as SCANS-IV are not appropriate for use as part of the assessment.*

- Noise-related impacts to marine mammals associated with noise during the construction and operational and maintenance phase, including the risk of injury and disturbance/displacement (for the construction phase).

11 ORNITHOLOGY

11.1 Introduction

This chapter considers the potential impacts to species of birds from the construction, operation and maintenance phases of the Marine Project. The chapter focuses on species that are known to be, or are likely to be present within the Study Area.

11.2 Legislation, Policy and Guidance

In addition to those described in Section 4 the following guidance, policy and legislation will be taken into consideration as part of the assessment of potential impacts on ornithology.

11.2.1 Legislation and Policy

The following legislation and policy are considered relevant:

- WCA 1981, as amended. The WCA 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain. It provides protection for all species of wild birds and their nests and establishes the system of SSSI.
- Scotland's NMP. General Policy 9. The Scottish Government, 2015. "Natural heritage: Development and use of the marine environment must:
    - Comply with legal requirements for protected areas and protected species;
    - Not result in significant impact on the national status of PMFs;
    - Protect and, where appropriate, enhance the health of the marine area.

- Shetland Islands Regional Marine Plan (2025)
    - Policy MP BIOD1: Protected Sites and Species:
        - Proposals for marine development and use must comply with all legal requirements for protected areas and protected species, and should consider potential direct and indirect effects, including disturbance and any cumulative impacts.
        - Internationally Designated Sites: Proposals that may affect a European Site (SACs and SPAs) must comply with the relevant legislation and will only be supported where they meet the relevant statutory tests. All Ramsar sites are also European Sites and/or SSSIs and are extended protection under the relevant statutory regimes.
        - Nationally Designated Sites: Proposals that could affect Nature Conservation MPAs or Demonstration and Research MPAs must comply with the relevant legislation for these protected areas. Proposals that could affect a SSSI or National Nature Reserve must comply with the relevant legislation for these protected areas.
        - Local Nature Conservation Sites: Proposals that could affect a site designated as a LNCS should have regard to SIC's Local Development Plan and its Supplementary Guidance on LNCS.

- Protected Species: Proposals for marine development or use that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present, or may be affected by a proposal, steps must be taken to establish their presence. Applicants should consider within the planning and design of the proposal the level of protection afforded by legislation and should fully consider any impacts to protected species.

- Policy MP BIOD4: Furthering the Conservation of Biodiversity:
  - Development and use of the marine environment must protect and, where appropriate, enhance the health of Shetland's marine area so far as is consistent with the exercise of functions relating to the proposed development or use. Where proposals may have a significant adverse effect on biodiversity or the ecosystem services of biodiversity, including any cumulative impact, the applicant should further consider measures to avoid, minimise, or mitigate any harm or disturbance to the ecosystem services, continuity, and integrity of the habitats or species affected. Applicants should consider impacts on areas which are important to all aspects of a species' life cycle including locations used for breeding, nesting, resting, foraging and seasonal use, including overwintering.

11.2.2 Guidance

The following guidance is considered relevant:

- NatureScot (2018). Environmental Impact Assessment Handbook. V5; and,
- CIEEM (2018). Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal. Winchester, Institute of Ecology and Environmental Management. https://cieem.net/wp-content/uploads/2019/02/Combined-EclA-guidelines-2018-compressed.pdf.

11.3 Study Area

The study area encompasses the proposed Project area and a 10 km buffer zone around the Marine Project (Figure 6-2).

11.4 Data and Information Sources

Publicly available data and literature used in this Scoping Assessment are presented in Table 11-1.

Table 11-1 Summary of key sources of ornithology information for assessment

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Special Protection Areas	https://www.nature.scot/professional-advice/protected-areas-and-species/protected-	2025	NatureScot

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
	areas/international-designations/european-sites/special-protection-areas-spas		
Seabird foraging ranges	Published reviews summarising breeding seabird foraging ranges in the UK	2019	Woodward *et al.*
Seabird tracking studies	BirdLife International Seabird Tracking Database	Ongoing	BirdLife International
Seabird distribution at sea (Published reports summarising the at-sea distribution and utilisation of marine habitats by seabirds in Scottish waters)			
Distribution maps of cetacean and seabird populations in the North-East Atlantic	https://doi.org/10.1111/1365-2664.13525	2020	Waggitt *et al.*
Breeding density, fine-scale tracking, and large-scale modelling reveal the regional distribution of four seabird species	https://doi.org/10.1002/eap.1591	2017	Wakefield *et al.*
An analysis of the numbers and distribution of seabirds within the British Fishery Limit aimed at identifying areas that qualify as possible marine SPAs	https://hub.jncc.gov.uk/assets/7db38547-5074-4136-8973-fd7d97666120#:~:text=This%20report%20describes%20an%20analysis,over%20more%20than%2030%20years.	2010	Kober *et al.*
Seabird receptor population size estimates, trends and conservation status			
JNCC Seabird Monitoring Programme database	https://app.bto.org/seabirds/public/index.jsp	Ongoing	JNCC
Seabirds Count – the fourth Breeding Seabird Census	Seabirds Count: A census of breeding seabirds in Britain and Ireland (2015–2021)' Summary of the recently completed national census of seabird colonies https://jncc.gov.uk/our-work/seabirds-count/	2023	Burnell *et al.*
Non-breeding season populations of seabirds in UK waters	https://publications.naturalengland.org.uk/publication/6427568802627584	2015	Furness
Birds of Conservation Concern 5	https://www.bto.org/sites/default/files/publications/bocc-5-a5-4pp-single-pages.pdf	2021	Stanbury *et al.*

11.5 Baseline Environment

11.5.1 Seabird receptors

The Scottish coastal and marine environment forms vital habitat to a variety of seabird species (Scottish Government, 2020). While the marine environment forms important habitat to seabirds year-round, birds are most vulnerable to human disturbance at sea during the moulting period when many species become flightless and spend greater time on the sea surface (Scottish Government, 2020). After the breeding season ends, many birds disperse from their coastal colonies to head to offshore waters, although some birds (e.g. divers) utilise coastal waters during the non-breeding (winter) period, including some birds which preferentially overwinter around the Shetland coast. This at-sea period increases the likelihood of interactions with survey vessels and potential collision risk.

11.5.2 Site-specific terrestrial ornithological surveys

SLR Consulting Ltd was commissioned by Statkraft Ltd UK to carry out additional ornithological surveys during the 2025 breeding season at the consented Mossy Hill Wind Farm. The consented Mossy Hill Wind Farm is located approximately Three km west of Lerwick, Shetland. The Site footprint is 605 ha and extends approximately 4.5 km from Run Hill in the South to the shore of Loch of Kebister to the North. The Site encompasses Hill of Tagdale, Mossy Hill, Run Hill, and reaches its highest elevation on the Hill of Dale summit, at 174 metres above sea level (SLR Consulting Ltd, 2025). The site boundary (the area within which is referred to as 'the Site') and survey areas are illustrated in Figure 11-1.

Vantage Point (VP) surveys were undertaken between April and September 2025 (SLR Consulting Ltd, 2025) following the standard NatureScot methodology (NatureScot, 2025c). VPs were selected to cover the maximum potential eight turbine layout plus a 500 m buffer. The locations and the viewsheds from the VPs are shown in Figure 11-1 (SLR Consulting Ltd, 2025).

The terrestrial baseline bird surveys recorded the presence of the following seabirds:

- Red-throated diver (*Gavia stellata)* (designated feature (breeding) in the East Mainland Coast, Shetland SPA)[16]
- Lapwing (*Vanellus vanellus*)
- Curlew (*Numenius arquata*)

[16] *Breeding Diver Focal VP Surveys*

- *Diver Focal VP2*

A total of 28 red-throated diver flights were recorded from VP2, with two adults and one chick observed on a loch within the viewshed on each of the six focal surveys conducted between 18 and 25 July (SLR Consulting Ltd, 2025).

- *Diver Focal VP3*

At total of 88 red-throated diver flights were recorded from VP3 during the eleven focal surveys conducted between 10-31 August. Two breeding pairs were identified within this viewshed, each successfully rearing a single chick.

- *Diver Focal VP4*

A total of 36 red-throated diver flights were recorded from VP4, with two adults and one chick observed on the loch on each of the four focal surveys conducted between 23 to 28 July and 15 August.

- *Diver Focal VP5*

A total of 39 red-throated diver flights were recorded from VP5, with two adults recorded attending a nest site within the viewshed during the 11 focal surveys conducted between 14-29 July.

- Great black-backed gull (*Larus marinus*)
- Herring gull (*Larus argentatus*)
- Great skua (*Stercorarius skua*)
- Arctic skua (*Stercorarius parasiticus*)
- Merlin (*Falco columbarius*)
- Brent goose (*Branta bernicla*)
- Oystercatcher (*Haematopus ostralegus*)
- Golden plover (*Pluvialis apricaria*)
- Ringed plover (*Charadrius hiaticula*)
- Whimbrel (*Numenius phaeopus*)
- Snipe (*Gallinago gallinago*)
- Redshank (*Tringa tetanus*)
- Black-headed gull (*Chroicocephalus ridibundus*)
- Common gull (*Larus canus*)
- Lesser black-backed gull (*Larus fuscus*)
- Common tern (*Sterna hirundo*)
- Arctic tern (*Sterna paradisaea*)
- Fulmar (*Fulmarus glacialis*)
- Gannet (*Morus bassanus*)
- Grey heron (*Ardea cinerea*)
- Sparrowhawk (*Accipiter nisus*)
- Kestrel (*Falco tinnunculus*)
- Eider (*Somateria mollissima*)
- Greenshank (*Tringa nebularia*)
- Shag (*Gulosus aristotelis*)
- Teal (*Anas crecca*)

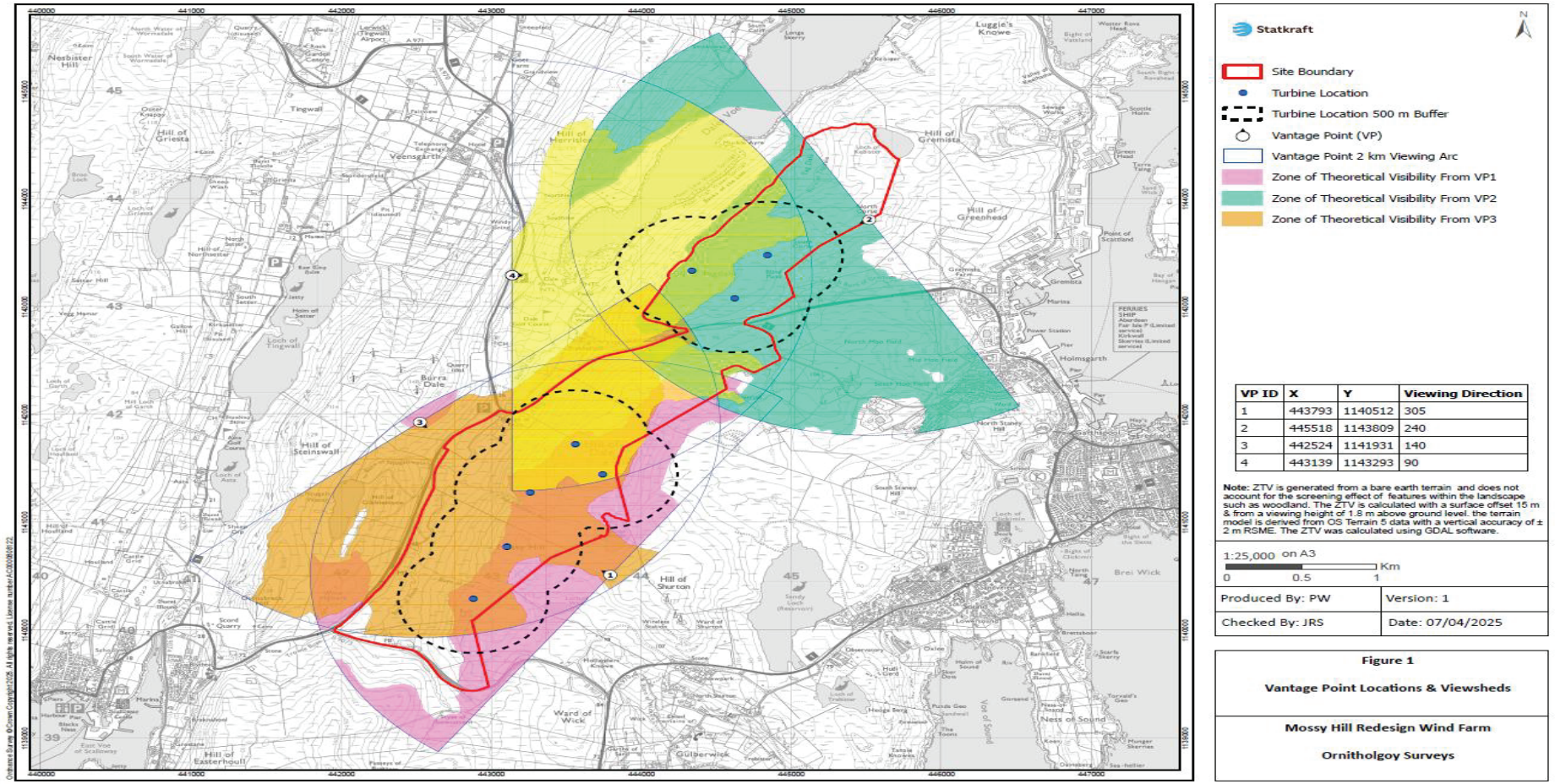

Figure 11-1 Site boundary, turbine locations, vantage points (VPs) and zones of theoretical visibility from VPs. Figure reproduced from SLR Consulting Ltd, (2025).

11.5.3 Designated sites

The closest SPA to the Marine Project is the East Mainland Coast, Shetland SPA which is designated for wintering and breeding seabirds (Table 11-2) and which overlaps with the Marine Project site. There is a series of SPAs and Ramsar sites that are found within a radius of 50 km from the area of the proposed works. These sites are shown in Table 11-2 and Figure 6-2. A buffer zone with a radius of 10 km will be used for designated sites in the EIA.

Table 11-2. Sites designated for the protection of seabirds.

SITE NAME	DISTANCE (km)	FEATURES
East Mainland Coast, Shetland SPA	0	Great northern diver (*Gavia immer*), wintering; Red-throated diver (*Gavia stellata*), breeding; Slavonian grebe (*Podiceps auritus*), wintering
Noss SPA	7.6	Atlantic puffin (*Fratercula arctica*); black-legged kittiwake (*Rissa tridactyla*), breeding; Common guillemot (*Uria aalge*), breeding; Great skua (*Stercorarius skua*), breeding; Northern fulmar (*Fulmarus glacialis*), breeding; Northern gannet (*Morus bassanus*), breeding
Noss SSSI	8.6	Arctic skua (*Stercorarius parasiticus)*, breeding; Gannet (*Morus bassanus*), breeding; Great skua (*Stercorarius skua*), breeding; Guillemot (*Uria aalge*), breeding; Kittiwake (*Rissa tridactyla*), breeding; Seabird colony, breeding
Ward of Culswick SSSI	17.8	Arctic skua (*Stercorarius parasiticus*), breeding; whimbrel (*Numenius phaeopus*), breeding
Mousa SPA	19.8	Arctic tern (*Sterna paradisaea*), breeding; European storm-petrel (*Hydrobates pelagicus*), breeding
Mousa SSSI	19.8	Arctic tern (*Sterna paradisaea*), breeding; European storm-petrel (*Hydrobates pelagicus*), breeding; Black guillemot (*Cepphus grille*), breeding.
Lochs of Spiggie and Brow SPA	28.4	Whooper swans (*Cygnus cygnus*), non-breeding
Dalsetter SSSI	28.5	Arctic tern (*Sterna paradisaea*), breeding
Papa Stour SPA	31.0	Arctic tern (*Sterna paradisaea*), breeding; Ringed plover (*Charadrius hiaticula*), breeding
Seas off Foula SPA	31.5	Arctic skua (*Stercorarius parasiticus*), breeding; Atlantic puffin (*Fratercula arctica*), breeding; Common guillemot (*Uria aalge*), breeding; Great skua (*Stercorarius skua*), breeding; Great

SITE NAME	DISTANCE (km)	FEATURES
		skua (*Stercorarius skua*), wintering; Northern fulmar (*Fulmarus glacialis*), breeding; Northern fulmar (*Fulmarus glacialis*), wintering
Sumburgh Head SPA	32.6	Arctic tern (*Sterna paradisaea*); common guillemot (*Uria aalge*), breeding; black-legged kittiwake (*Rissa tridactyla*), breeding; Northern fulmar (*Fulmarus glacialis*), breeding
Sumburgh Head SSSI	34.8	Guillemot (Uria aalge), breeding; Puffin (*Fratercula arctica*), breeding; seabird colony, breeding; Shag (*Phalacrocorax aristotelis*), breeding
Ronas Hill - North Roe SSSI	38.0	Arctic water flea (*Eurycercus glacialis*); breeding bird assemblage; red-throated diver (*Gavia stellata*), breeding
Ronas Hill - North Roe and Tingon SPA	38.0	Great skua (*Stercorarius skua*), breeding; red-throated diver (*Gavia stellata*), breeding
Ronas Hill - North Roe and Tingon Ramsar site	38.0	Arctic skua (*Stercorarius parasiticus)*; black guillemot (*Cepphus grille)*; great skua (*Stercorarius skua)*; northern fulmar (*Fulmarus glacialis*); red-throated diver (*Gavia stellata*); whimbrel (*Numenius phaeopus)*
Otterswick SSSI	38.2	Red-throated diver (*Gavia stellata*), breeding
Otterswick and Graveland SPA	38.2	Red-throated diver (*Gavia stellata*), breeding
Fetlar SPA	41.1	Arctic skua (*Stercorarius parasiticus*), breeding; Arctic tern (*Sterna paradisaea*), breeding; Dunlin (*Calidris alpina*), breeding; Great skua (*Stercorarius skua*), breeding; Northern fulmar (*Fulmarus glacialis*), breeding; Red-necked phalarope (*Phalaropus lobatus*), breeding; Whimbrel (*Numenius phaeopus*), breeding
Fetlar to Haroldswick NCMPA	42.3	Black guillemot (*Cepphus grylle*)
Lamb Hoga SSSI	44.7	Arctic skua (*Stercorarius parasiticus*), breeding; Breeding bird assemblage; Great skua (*Stercorarius skua*), breeding; Manx shearwater (*Puffinus puffinus*), breeding; Storm petrel (*Hydrobates pelagicus*), breeding
Bluemull and Colgrave Sounds SPA	44.8	Red-throated diver (*Gavia stellata*), breeding
Foula SPA	45.3	Arctic skua (*Stercorarius parasiticus*), breeding; Arctic tern (*Sterna paradisaea*), breeding; Atlantic puffin (*Fratercula arctica*), breeding; Black-legged kittiwake (*Rissa tridactyla*),

SITE NAME	DISTANCE (km)	FEATURES
		breeding; common guillemot (*Uria aalge*), breeding; European shag (*Gulosus aristotelis*), breeding; great skua (*Stercorarius skua*), breeding; Leach's storm-petrel (*Oceanodroma leucorhoa*), breeding; Northern fulmar (*Fulmarus glacialis*), breeding; Razorbill (*Alca torda*), breeding; Red-throated diver (*Gavia stellata*), breeding
Hascosay SSSI	47.4	Dunlin (*Calidris alpina schinzii*), breeding
North Fetlar SSSI	47.7	Arctic skua (*Stercorarius parasiticus*), breeding; Arctic tern (*Sterna paradisaea*), breeding; Breeding bird assemblage; Great skua (*Stercorarius skua*), breeding; Red-necked phalarope (*Phalaropus lobatus*), breeding; whimbrel (*Numenius phaeopus*), breeding
East Mires and Lumbister SSSI	48.7	Breeding bird assemblage

11.6 Embedded Mitigation Proposed

Certain measures have been proposed as part of the Marine Project development process in order to reduce the potential for impacts to the environment relevant to ornithological receptors. These measures will follow best practice and include:

- Development and Implementation of a Vessel Management Plan (VMP). Vessel management (within the VMP) to take into consideration disturbance to birds (e.g. follow guidance provided in the 'Scottish Marine Wildlife Watching Code' (SNH, 2017).
- Measures to prevent accidental release of contaminants into marine environment including strict observance of MARPOL regulations by all vessel operators (measures to be included in the MPCP);

11.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on ornithology during the construction phase:

- Vessel presence (noise, physical presence, lights) leading to disturbance of seabirds and/or their displacement from foraging habitats;
- Noise during the construction phase (e.g., piling activities) leading to disturbance of seabirds and/or their displacement from foraging habitat;
- Potential change to seabird prey availability e.g., through changes in availability of invertebrates and fish;

- Potential increase in SSCs and turbidity (e.g., due to seabed preparation activities, jetty and moorings installation, anchoring and vessel spud cans), leading to reduced visibility and potential for reduced seabird foraging success; and,
- Potential accidental release of pollutants (e.g., from vessels), leading to lethal and sub-lethal effects on seabirds.

The following Marine Project activities have the potential to impact on ornithology during the operation and maintenance phase:

- Vessel presence (noise, physical presence, lights from vessel used in offloading of ammonia) leading to disturbance of seabirds and/or their displacement from foraging habitats;
- Noise leading to disturbance of seabirds and/or their displacement from foraging habitat;
- Potential change to seabird prey availability (e.g., small fish and squid) due to the presence of the jetty and moorings;
- Potential increase in SSCs and turbidity (e.g., due to vessel anchors), leading to reduced visibility and potential for reduced seabird foraging success;
- Potential accidental release of pollutants (e.g., from vessels), leading to lethal and sub-lethal effects on seabirds.

11.8 Scoping of Impacts

The scope of potential impacts of the Marine Project on ornithology receptors is examined in Table 11-3. The range of potential impacts listed in Table 11-3 and the nature of these impacts is based on published literature on how developments in the marine environment can affect birds and the vulnerability of identified species to the various potential impacts.

Table 11-3 Potential impacts arising from the Project on ornithology receptors and scoping for detailed examination in EIA.

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Vessel presence (noise, physical presence, lights) leading to disturbance of seabirds and/or their displacement from foraging habitats	Construction	The Marine Project site overlaps with the East Mainland Coast Shetland SPA, which is designated for Slavonian grebe (wintering), red throated diver (breeding) and great northern diver (wintering). The potential for vessel presence (noise, physical presence, lights) to lead to disturbance/displacement/exclusion during the construction phase will be highly localised, short term and temporary. The size of the area potentially affected is negligible in the context of the size of foraging area available to the seabird / intertidal / waterbirds that potentially reside or occur in the Study Area. Therefore, this impact is concluded to be negligible and is scoped out of further assessment.	Scoped out
	Operation & Maintenance	The size of the area potentially affected is negligible in the context of the size of foraging area available to the seabird / intertidal / waterbirds that potentially reside or occur in the Study Area. However, the Marine Project site overlaps with the East Mainland Coast, Shetland SPA, which is designated for Slavonian grebe (wintering), red throated diver (breeding) and great northern diver (wintering). Considering the presence of the vessel for offloading of ammonia once every 15 weeks, this impact is scoped in for further assessment.	Scoped in
Noise leading to disturbance of seabirds and/or their displacement from foraging habitat	Construction	Noise during the construction phase (e.g., piling activities, jetty and moorings installation), will be highly-localised, temporary and transient. However, as the Marine Project site overlaps with the East Mainland Coast, Shetland SPA, which is designated for Slavonian grebe (wintering), red throated diver (breeding) and great northern diver (wintering). The impact is scoped in for further assessment.	Scoped in
	Operation & Maintenance	Noise during the operation and maintenance phase will be highly localised, temporary and transient and significantly reduced from that expected to be generated during the construction phase. The size of the area potentially affected is negligible in the context of the size of foraging area available to the seabird / intertidal / waterbirds that potentially occur or reside in the Study	Scoped out

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
		Area. Therefore the impacts are concluded to be negligible and scoped out of any further assessment.	
Potential change to seabird prey availability (e.g., small fish and squid)	Construction, Operation & Maintenance	The size of the area potentially affected (e.g. due to the presence of jetty and moorings) is negligible in the context of the size of foraging area available to the seabird / intertidal / waterbirds species that potentially occur or reside in the Study Area. Therefore, the impacts are concluded to be negligible and scoped out of any further assessment.	Scoped out
Potential increase in suspended sediment, leading to reduced visibility and potential for reduced seabird foraging success	Construction, Operation & Maintenance	The size of the area potentially affected is negligible in the context of the size of foraging area available to the seabird / intertidal / waterbirds species that potentially occur in the Study Area. Therefore, the impacts are concluded to be negligible and scoped out of any further assessment.	Scoped out
Potential accidental release of pollutants, leading to lethal and sub-lethal effects on seabirds	Construction, Operation & Maintenance	Embedded mitigation measures (e.g. implementation of a pollution prevention plan agreed with the regulator) will support efforts to avoid the risk of accidental releases of pollution and as a result seabird/intertidal/waterbirds species are unlikely to be adversely affected by this effect.	Scoped out

11.9 Approach to Analysis and Assessment

The EIA for ornithology will be conducted in line with the methodology and processes identified in Section 2.3 and the relevant legislation identified in Section 11.2. The approach to EIA for ornithology (including wintering bird surveys and data collection) will be agreed with key stakeholder groups and will be partly informed using the detail presented in the following relevant technical chapters:

- Marine and Coastal Physical Processes (Section 6);
- Benthic Ecology (Section 8); and,
- Fish and Shellfish Ecology (Section 9).

The extent of the study area for birds will take into account the relevant species (i.e. those species potentially affected) known distribution and breeding season foraging ranges (Woodward *et al.*, 2019). Where necessary mitigation and/or monitoring measures will be identified as required during the EIA process, to be informed through the assessment process itself. in consultation with stakeholders.

11.9.1 Site-specific survey recommendations

The Marine Project site overlaps with the East Mainland Coast, Shetland SPA, which is designated for Slavonian grebe (wintering), red throated diver (breeding) and great northern diver (wintering). Currently, there is no wintering bird data collected (SLR Consulting Ltd, 2025). The use of the existing vantage point data (SLR Consulting Ltd, 2025) together with results from a wintering bird survey performed to inform the assessment, is recommended.

11.10 Summary

The Ornithology topic will be addressed within the EIA. The following impacts are scoped in for further assessment:

- Vessel presence (noise, physical presence, lights) leading to disturbance of seabirds and/or their displacement from foraging habitats (operation and maintenance phase)
- Noise leading to disturbance of seabirds and/or their displacement from foraging habitat (construction phase).

12 OTHER SEA USERS

12.1 Introduction

This chapter will provide an overview of the sensitivities associated with other sea users receptors (including oil and gas activities, marine renewable energy developments, submarine cables, commercial fisheries[17] and aquaculture) within the Study Area. An overview of the potential impacts of the Marine Project on other sea users, including during the construction and operation and maintenance phases of the Marine Project, are also discussed.

Information that may be considered relevant to this section is also presented within the below sections:

- Fish and shellfish ecology (Section 9); and
- Shipping and navigation (Section 13).

12.2 Legislation, Policy and Guidance

In addition to the relevant policy and legislation described in Section 4, the following section outlines the legislation and guidance that will be taken into consideration on the potential impacts on other sea users (including commercial fisheries and aquaculture) within the Marine Project.

12.2.1 Legislation and Policy

The following legislation and policy was considered relevant:

- Fisheries Act 2020.
- Scotland's NMP (Scottish Government, 2015):
  - Provides sector-specific information and guidance relevant for the interaction between other users of the marine environment and a marine development. The relevant other users of the marine environment identified in this Scoping Report include:
    - Commercial fisheries;
    - Aquaculture;
    - Subsea cables;
    - Dredged material deposit sites;
    - Marine recreation and tourism.
  - General Policy 2: Economic benefit:
    - Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.
  - General Policy 3: Social Benefit:

[17] *Commercial fisheries is defined, for the purpose of this report, as activity by licensed fishing vessels undertaking fishing for legitimate capture and sale of finfish and shellfish in the marine environment. Freshwater aquaculture, recreational fishing and fishing activities in rivers are not considered within this section.*

- Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan.

– General Policy 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.
– General Policy 17: Fairness:
  - All marine interests will be treated with fairness and in a transparent manner when decisions are being made in the marine environment.
– Fisheries Policy 1:
  - Taking account of the EU's Common Fisheries Policy, Habitats Directive, Birds Directive and Marine Strategy Framework Directive, marine planners and decision makers should aim to ensure:
    - Existing fishing opportunities and activities are safeguarded wherever possible.
    - An ecosystem-based approach to the management of fishing which ensures sustainable and resilient fish stocks and avoids damage to fragile habitats.
    - Protection for vulnerable stocks (in particular for juvenile and spawning stocks through continuation of sea area closures where appropriate).
    - Improved protection of the seabed and historical and archaeological remains requiring protection through effective identification of high-risk areas and management measures to mitigate the impacts of fishing, where appropriate.
    - That other sectors take into account the need to protect fish stocks and sustain healthy fisheries for both economic and conservation reasons.
    - Delivery of Scotland's international commitments in fisheries, including the ban on discards.
    - Mechanisms for managing conflicts between fishermen and/or between the fishing sector and other users of the marine environment.
– Fisheries Policy 2:
  - The following key factors should be taken into account when deciding on uses of the marine environment and the potential impact on fishing:
    - The cultural and economic importance of fishing, in particular to vulnerable coastal communities.
    - The potential impact (positive and negative) of marine developments on the sustainability of fish and shellfish stocks and resultant fishing opportunities in any given area.
    - The environmental impact on fishing grounds (such as nursery, spawning areas), commercially fished species, habitats and species more generally.
    - The potential effect of displacement on: fish stocks; the wider environment; use of fuel; socio-economic costs to fishers and their communities and other marine users.
– Fisheries Policy 3:
  - Where existing fishing opportunities or activity cannot be safeguarded, a Fisheries Management and Mitigation Strategy (FMMS) should be prepared by the proposer of development or use, involving full engagement with local fishing interests (and other

interests as appropriate) in the development of the Strategy. All efforts should be made to agree the Strategy with those interests. Those interests should also undertake to engage with the proposer and provide transparent and accurate information and data to help complete the Strategy. The Strategy should be drawn up as part of the discharge of conditions of permissions granted.

- The content of the Strategy should be relevant to the particular circumstances and could include:
  - An assessment of the potential impact of the development or use on the affected fishery or fisheries, both in socio-economic terms and in terms of environmental sustainability.
  - A recognition that the disruption to existing fishing opportunities / activity should be minimised as far as possible.
  - Reasonable measures to mitigate any constraints which the proposed development or use may place on existing or proposed fishing activity.
  - Reasonable measures to mitigate any potential impacts on sustainability of fish stocks (e.g. impacts on spawning grounds or areas of fish or shellfish abundance) and any socio-economic impacts."
- Where it does not prove possible to agree the Strategy with all interests, the reasons for any divergence of views between the parties should be fully explained in the Strategy and dissenting views should be given a platform within the Strategy to make their case.

– Fisheries Policy 4:
  - Ports and harbours should seek to engage with fishing and other relevant stakeholders at an early stage to discuss any changes in infrastructure that may affect them. Any port or harbour developments should take account of the needs of the dependent fishing fleets with a view to avoiding commercial harm where possible. Where a port or harbour has reached a minimum level of infrastructure required to support a viable fishing fleet, there should be a presumption in favour of maintaining this infrastructure, provided there is an ongoing requirement for it to remain in place and that it continues to be fit for purpose.

– Fisheries Policy 5:
  - Inshore Fisheries Groups (IFGs) should work with all local stakeholders with an interest to agree joint fisheries management measures. These measures should inform and reflect the objectives of regional marine plans.

Policies under Section 6 Sea Fisheries (FISHERIES 1 - 5) and General Policies GEN 1, GEN 4, and GEN 17 are considered relevant to Commercial Fisheries and will be considered by the EIA.

- Shetland Islands Regional Marine Plan (2025):
  – Policy MP FISH1: Safeguarding Fishing Opportunities:
    - Proposals for marine development and use should consider potential impacts on fisheries and associated communities and how the proposal could safeguard fisheries by avoiding or mitigating: a) significant negative impacts to important fishing areas[18]; b) permanent

[18] *Fishing areas may be 'important' in relation to the species caught, gear(s) used, the size or type of fishing vessels that operate in the area, and/or the communities where those vessels are based*

significant obstruction to important fishing areas unless there are no reasonable alternatives; c) significant adverse environmental impacts to known/designated spawning or nursery areas, or habitats or species which are important for commercially important species of fish; and d) the creation of navigational hazards to commercial fishermen. Proposals should further recognise the cultural importance of fishing, particularly for vulnerable coastal communities and should consider any adverse impacts on fishing areas important for those communities.

- Policy MP AQ2: Finfish and Shellfish Aquaculture:
  - Applicants for finfish aquaculture developments are encouraged to seek agreement with other operators in the area to reduce the potential for disease transmission, increase fish welfare, or control and manage sea lice numbers. This can be achieved through a Farm Management Agreement, an Area Management Agreement or a Farm Management Statement which: a) reflects (as far as possible) the recommendations of the Code of Good Practice; b) includes a stocking and fallowing plan; and c) is formally reviewed between signatories at least every 2 years.

12.2.2 Guidance

The following guidance is considered relevant:

- Best practice guidance for fishing industry financial and economic impact assessments (UK Fisheries Economics Network, 2012);
- Scottish Government and Xodus Group Limited (2022): Good Practice Guidance for Assessing Fisheries Displacement by Other Licensed Marine Activities (and associated Literature Review). These documents provide good practice guidance for assessing fisheries displacement by other licensed marine activities.
- Marine Guidance Note (MGN) 661 (M+F) Navigation - safe and responsible anchoring and fishing practices (Maritime & Coastguard Agency, 2021);
- Options and opportunities for marine fisheries mitigation associated with windfarms (Blyth-Skyrme, 2010).

12.3 Study Area

The commercial fisheries study area is defined by the ICES rectangle within which the Marine Project resides and that will be directly impacted by the Project. The Project is located within a single ICES rectangle, 49E8. A buffer of 10 km has been placed around the Marine Project (Figure 12-1, Figure 12-2) to consider the movement of mobile users. The buffer applied is consistent with the buffer applied for the shipping and navigation topic (Section 13).

12.4 Data and Information Sources

The existing data sets and literature with relevant coverage to the Tagdale Project which have been used to inform this Scoping Report are outlined in Table 12-1.

Table 12-1 Summary of key sources of information for other sea users receptors (including commercial fisheries and aquaculture)

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
Fishing - Activity data and statistics	https://marine.gov.scot/?q=information/fishing-activity	2018-2022	Scottish Government
Fisheries statistics per ICES rectangle	https://www.gov.uk/government/collections/uk-sea-fisheries-annual-statistics	2023	MMO
Average intensity (hours) of fishing with bottom trawls, dredges, and for *Nephrops* and crustaceans	https://marine.gov.scot/?q=maps/1832	2010-2020	ICES
NBN Atlas	https://nbnatlas.org/	2015	NBN
ScotMap – Inshore Fisheries Mapping Project in Scotland	https://data.marine.gov.scot/dataset/scotmap-inshore-fisheries-mapping-scotland-recording-fishermen%E2%80%99s-use-sea	2014	Kafas *et al.*
Marine Scotland Salmon and Sea Trout Fishery Statistics and other associated reports	https://www.gov.scot/publications/salmon-fishery-statistics-2020/	Various	Marine Scotland
Creel Fishing Study	https://www.gov.scot/publications/creel-fishing-effort-study/pages/1/	2017	Marine Scotland
Aquaculture Spatial Data	https://www.crownestatescotland.com/resources/documents	Crown Estate Scotland	2022
Scotland's NMP	https://www.gov.scot/publications/scotlands-national-marine-plan/	Marine Scotland	2015
Cables – power and telecoms	https://kis-orca.org/subsea-cables/	KIS-ORCA	2020
The North Sea Transition Authority Interactive Maps	https://www.nstauthority.co.uk/data-and-insights/insights-and-analysis/maps-and-dashboards/	2026	North Sea Transition Authority
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
UK Offshore Energy SEA 3 – Appendix 1h – Other Users and Material Assets	https://www.gov.uk/government/consultations/uk-offshore-energy-strategic-environmental-assessment-3-oesea3#full-publication-update-history	DECC	2016

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
UK Offshore Energy SEA 4 – Appendix 1h – Other Users and Material Assets	https://www.gov.uk/government/consultations/uk-offshore-energy-strategic-environmental-assessment-4-oesea4	BEIS	2022
Energy and Infrastructure Spatial Data	https://www.crownestatescotland.com/resources/documents	Crown Estate Scotland	2022
Scotland's Marine Atlas: Information for the NMP	https://marine.gov.scot/sma/content/scotlands-marine-atlas-information-national-marine-plan#:~:text=Scotland%27s%20Marine%20Atlas%3A%20Information%20for%20The%20National%20Marine,The%20Scottish%20Government%20%205%20more%20rows%20	Baxter *et al.*	2011
Draft Regional Locational Guidance	https://marine.gov.scot/information/regional-locational-guidance	Marine Scotland	2019

No site-specific surveys with regards to other sea users have been carried out to inform this Scoping Report. Consultation with other user organisations will be an important source of data for the EIA.

12.5 Baseline Environment

This section provides an overview of other sea users, including fishers and aquaculture receptors which have the potential to be affected by the proposed works. Relevant assets belonging to other sea users within 10 km of the Marine Project site can be seen in Figure 12-1 and Figure 12-2.

12.5.1 Commercial fisheries

The proposed works will occur within the International Council for the Exploration of the Sea (ICES) statistical rectangle 49E8.

According to Scottish Government (2025a), fishing data for 2023 for ICES rectangle number 49E8 is targeted primarily for demersal species (Table 12-2) which in 2023 accounted for approximately 50% of value and 37% of landings. The reviewed data also shows that there is some shellfish creeling for crabs and lobster within Dales Voe as well as fishing using dredges (Scottish Government, 2025a). Fishing with creels, pots and traps (with under 12 m vessels) and dredges takes place in the Voe with the average annual value for the period 2018-2022 for these fishing activities being circa £50,000 GBP or greater (Scottish Government, 2025a), respectively.

Table 12-2 Commercial fish species in ICES statistical rectangle 49E8

ICES STATISTICAL RECTANGLE	SPECIES
49E8	Mackerel
	Cod
	Haddock
	Scallops
	Herring

Table 12-3 shows the number of days fished per year in ICES statistical rectangles 49E8. Overall, the data shows that the fishing effort in this area is relatively low to moderate between 0 and 200 days fished.

Table 12-3 Number of Days Fished per Month (All Gears) in ICES Rectangle number in years (Scottish Government, 2025a)

ICES rectangle	Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total
49E8	2023	122	123	127	66	134	97	95	162	102	150	125	65	1368
	2022	91	86	96	94	106	109	86	161	150	129	121	110	1340
	2021	96	92	71	86	118	101	109	122	131	152	159	113	1350
	2020	56	71	85	85	76	88	112	159	100	110	141	84	1168
	2019	123	93	95	116	137	102	336	151	138	118	229	91	1729

Note: Monthly fishing effort by UK vessels landing into Scotland: Blank = no data, D = Disclosive data (indicating very low effort, specifically less than 5 over 10 m vessels undertook fishing activity in that month), green = 0 – 100 days fished, yellow = 101 – 200, orange =201-300, red = >=301]

12.5.2 Aquaculture

The Marine Project's sites falls within the Dales Voe Shellfish Water Protected Area (SWPA) (Figure 12-1). SWPAs are crucial for maintaining the quality of the water where shellfish are harvested. Project activities (e.g., seabed preparation) have the potential to impact the quality of SWPAs waters. There is one active shellfish aquaculture site in close vicinity (i.e. 0.9 km) of the proposed operations. In Dales Voe there are two inactive or deregistered aquaculture sites for finfish; one in the vicinity (i.e. 0.5 km) of the proposed works and one in the northern region of Dales Voe close to the opening to the North Sea) (Figure 12-1).

12.5.3 Oil and gas activities

There are no oil and gas activities and pipelines within the vicinity of the proposed works in Dales Voe; therefore, any potential impacts on them are scoped out and not considered further.

12.5.4 Marine renewable energy developments

There are no marine renewable energy developments located in the vicinity of the proposed works and therefore any potential impacts on them are scoped out and not considered further.

12.5.5 Subsea cables

There is one active power cable within a radius of 10 km from the Marine Project site (Figure 12-2) located approximately 4 km away from the Marine Project). Due to the distance to the Marine Project, this is scoped out and not considered further due to a lack of any relevant or significant impact pathway.

12.5.6 Licensed dredged material deposit sites

There is one open dredge spoil disposal site within a radius of 10 km from the Marine Project site (Figure 12-2), but due to the distance to the Marine Project, this is scoped out and not considered further due to lack of any relevant or significant impact pathway. Dredging does take place in Dales Voe by Lerwick Harbour Authority for the decommissioning yard and cumulative effects related to this project activity will likely be considered within the EIA.

12.5.7 Ports

In the vicinity of the Marine Project site (at about 550 m) there is the Dales Voe decommissioning yard which is managed and operated by Lerwick Port Authority. The yard is a deep-water facility primarily used for oil and gas decommissioning, handling large structures and heavy-lift operations. Vessels typically visit the nearby Dales Voe decommissioning yard for decommissioning purposes, which requires relatively infrequent, but often complex vessel movements. Dales Voe decommissioning yard is currently planning an expansion, so vessel movements are likely to increase. Cumulative effects with the Marine Project will be considered in the EIA.

12.5.8 Military and defence activities

There are no military and defence activities located within the vicinity of the proposed works; therefore any potential impacts on them are scoped out and not considered further.

12.5.9 Marine recreation and tourism

The reviewed data indicates that there is very little recreation activity that occurs within Dales Voe. There is also very little recreational activity occurring in the wider area (Figure 13-1). There are no designed bathing waters within 2 km of the Marine Project area. In the Scoping Opinion for the Dales Voe Ultra Deep Water Quay Development (which is

located approximately 550 m away from the Marine Project site) the Royal Yachting Association (RYA) Scotland mentions that although recreational craft do come into Dales Voe, for example to anchor at the head of the Voe behind Muckle Ayre, they are unlikely to be adversely affected by the Dales Voe Ultra Deep Water Quay Development. Based on the this, impacts on marine recreation and tourism will be negligible and are therefore scoped out and not considered further.

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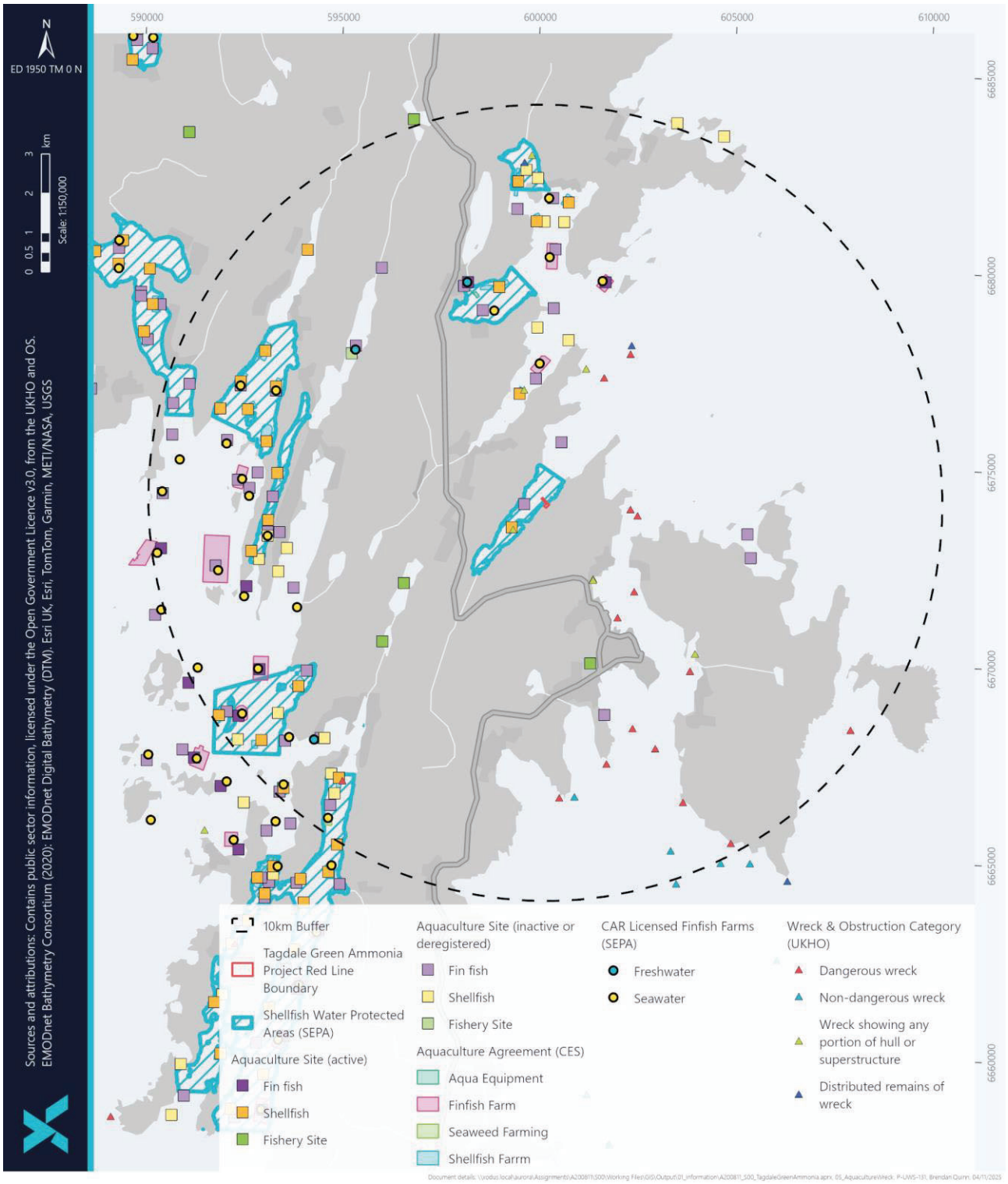

Figure 12-1 Other sea users in a radius of 10 km from the Project area.

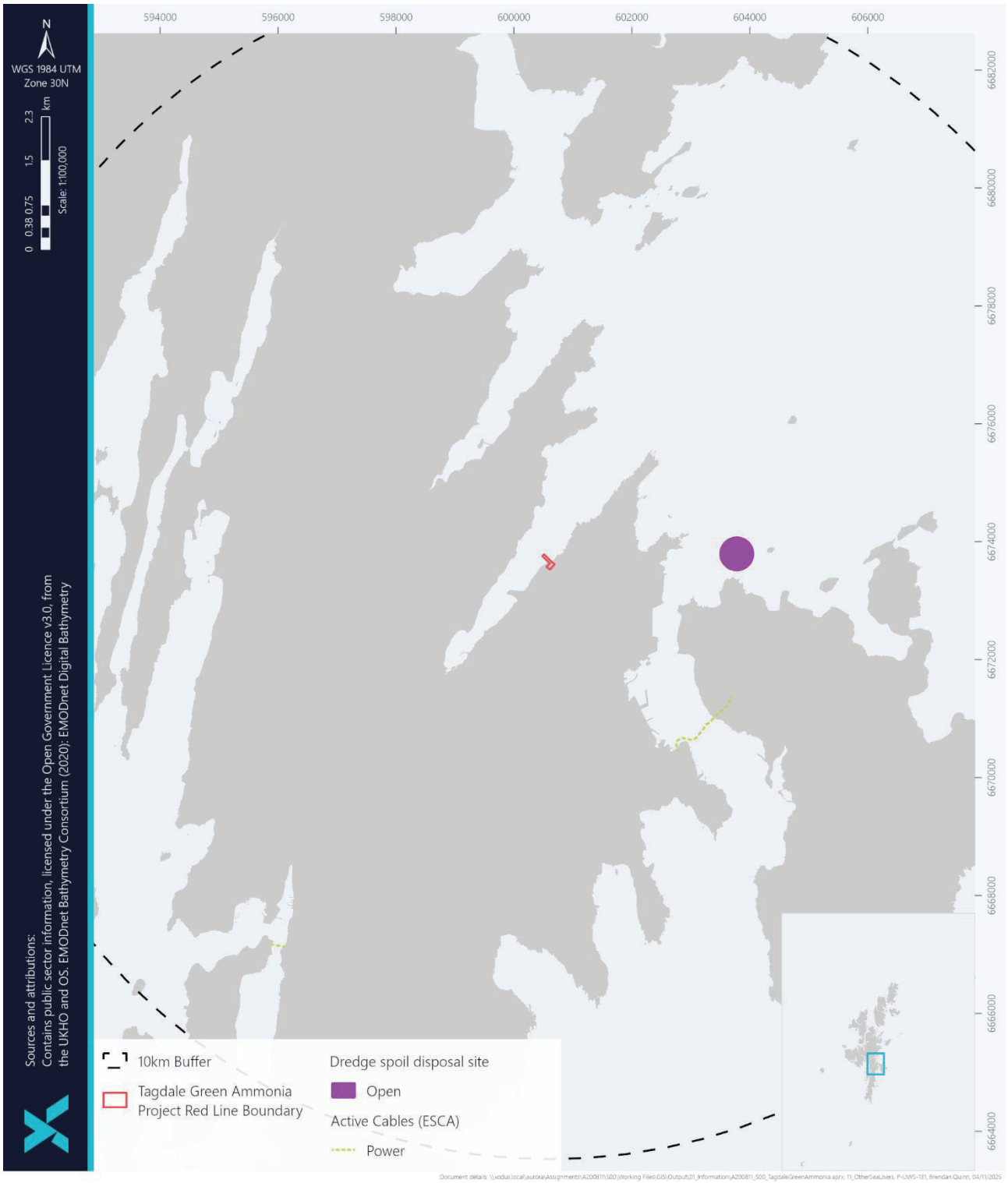

Figure 12-2 Other sea users in a radius of 10 km from the Project area.

12.6 Embedded Mitigation Proposed

Certain measures have been proposed as part of the Marine Project development process in order to reduce the potential for impacts to the environment relevant to other sea users receptors. These measures will follow best practice and are described as follows:

- Promulgation of information to the UKHO to ensure all information required is provided in a timely fashion for inclusion on charts. This includes for example:
  - Notice to Mariners;
  - Kingfisher bulletins; and,
  - Publication in additional appropriate media outlets.
- Consultation with all other users of the marine environment likely to be impacted by activities associated with the Project will be performed as required throughout the construction and operation and maintenance phases of the Marine Project. Any maintenance work required during the operational phase of the Project will be communicated effectively. This includes owners and operators of other marine infrastructure should occur to manage any works undertaken during the construction, operation and maintenance phases of the Project.
- All vessels will comply with the provisions of the International Regulations for the Prevention of Collision at Sea (COLREGs) and the International Regulations for the Safety of Life at Sea (SOLAS) (measures to be included in the VMP);

There is a commitment for the Marine Project to implement these measures and they have been considered within the scoping assessment. The requirement for additional mitigation measures (secondary mitigation) will be dependent on the significance of the effects on other sea users (including commercial fisheries and aquaculture) receptors and will be consulted upon with consultees throughout the EIA process.

12.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on others sea users (including commercial fisheries and aquaculture) during the construction phase:

- Displacement of fishing activity into other areas due to the presence of jetty and moorings;
- Interference with fishing activity as a result of increased vessel traffic;
- Obstruction of aquaculture activities (presence of active shellfish aquaculture in less than One km from the Marine Project site) due to an increase in vessel traffic; and,
- Obstruction of recreational and tourism activities e.g. due to the increase in vessel traffic during the construction phase.

The following Marine Project activities have the potential to impact on other sea users (including fisheries and aquaculture) during the operation and maintenance phase:

- Interference with fishing activity as a result of increased vessel traffic (e.g., due to the transit of vessel transporting ammonia / obstruction of regular fishing vessel transit routes due to the presence of the jetty and moorings;

- Displacement to other fishing grounds due to the presence of the jetty and moorings; and,
- Obstruction of aquaculture activities, recreational and tourism activities e.g. due to the transits of the vessel transporting the ammonia.

12.8 Scoping of Impacts

A number of potential impacts on commercial fisheries, aquaculture and ports receptors have been identified, which may occur during the construction and operation and maintenance phases of the Marine Project. The potential impacts have been summarised in Table 12-4.

Table 12-4 Potential impacts arising from the Marine Project on other sea users (including commercial fisheries and aquaculture) receptors and scoping for detailed examination in EIA.

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
		Commercial fisheries	
Displacement of fishing activity into other areas	Construction	Given the low fishing activity and the localised nature of the Marine Project, displacement from fishing grounds is considered not significant. Therefore, this impact is proposed to be scoped out of the EIA.	Scoped out
Interference with fishing activity as a result of increased vessel traffic / obstruction of regular fishing vessel transit routes due to the presence of jetty and moorings	Construction	Due to the temporary increase in vessel traffic during the construction phase and the relatively low fishing activity in the area, the interference impact has been scoped out.	Scoped out
	Operation & Maintenance	Ammonia offloading operation will occur every 15 weeks; therefore, interference with the (low in overall) fishing activity, during the operation and maintenance phase is likely to be negligible. Due to the highly localised effects of the jetty and moorings any obstruction of regular fishing vessel transits will be negligible and thus this impact has been scoped out.	
Displacement to other fishing grounds due to the presence of jetty and moorings	Operation & Maintenance	Considering the low frequency of the visits of the vessel to be used for the transportation of the ammonia (once every 15 weeks) and the relatively low fishing activity in the area, the displacement to other fishing grounds will be negligible and therefore has been scoped out.	Scoped out
		Other sea users	
Interaction with aquaculture activities	Construction, Operation & Maintenance	There is one active shellfish aquaculture site in the close vicinity (i.e. 0.9 km) of the proposed operations. The Project's sites falls within the Dales Voe Shellfish Water Protected Area. Therefore, this impact has been scoped in.	Scoped in

12.9 Approach to Analysis and Assessment

The assessment of impacts arising from the Marine Project on other sea users will include a desk-based study of available data and information (as identified in Section 12.4) and will be supplemented with stakeholder communication during the EIA phase of the Marine Project.

For aquaculture, the direct and indirect impacts of those potential impacts scoped into the EIA Report will be considered, either cumulatively or alone. No sediment transport modelling is proposed as sediment disturbance is anticipated to be limited.

Consultation will be undertaken with the local aquaculture development in the vicinity of the proposed operations. This consultation with other sea users will develop a clearer understanding of the nature, timing and duration of any other works that will be ongoing in the waters adjacent to the Marine Project area during the construction, operation and maintenance phases of the Marine Project.

12.10 Summary

The Other Sea Users topic will be addressed within the EIA. The following impact is scoped in for further assessment:

- Obstruction of aquaculture activities (construction and operation and maintenance phases).

13 SHIPPING AND NAVIGATION

13.1 Introduction

This chapter of the Scoping Report considers the potential likely effects of the Marine Project associated with shipping and navigation and considers the potential impacts / risks from the construction and operation and maintenance phases of the Marine Project on maritime users. The planned approach to assessing the impacts / risks associated with the Marine Project within a Navigational Risk Assessment (NRA) is also outlined.

13.2 Legislation, Policy and Guidance

The following legislation, policy and guidance are relevant to the assessment of impacts from the Project on shipping and navigation:

13.2.1 Legislation and Policy

The following legislation and policy is considered relevant:

- Convention on the International Regulations for Preventing Collisions at Sea (COLREGS) as amended (International Maritime Organization (IMO), 1972/77);
- International Convention for the Safety of Life at Sea (SOLAS) as amended (IMO, 1974);
- United Nations Convention on the Law of the Sea (UNCLOS) (United Nations (UN), 1982);
- Scotland's NMP. General Policy 4. Scottish Government, 2015:
    - 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.
- Shetland Islands Regional Marine Plan (2025):
    - Policy MP SHIP1: Safeguarding Navigation Channels and Port Areas
        - "Proposals for marine development and use should consider safety and navigation impacts on other marine users. Applicants may be required to demonstrate the proposal will not have an adverse impact on the efficient and safe movement or navigation of shipping to and from ports, harbours, marinas and anchorages or the long-term operational capacity of a ferry operation. Where shipping may be displaced, applicants may be required to quantify and consider the impacts of increased fuel use. Proposals which have the potential to restrict identified future expansion of important ports and harbours (e.g., as identified within a local development plan or masterplan) may be refused."
    - Policy MP SHIP2: Marine Environmental High-Risk Areas (MEHRAs):
        - Proposals for marine development and use should consider the presence and status of Marine Environmental High Risk Areas (MEHRAs).
    - Policy MP REC1: Safeguarding Marine Recreation:
        - Proposals for marine development and use should consider potential impacts on marine recreation, including how the proposal could safeguard marine recreation by avoiding or mitigating the reduction or loss of amenity. Proposals should consider how continued

access rights to the marine and coastal resource for recreational use can be maintained, with any necessary changes to land access to be determined through the planning process. Opportunities for co-existence should be fully considered.

13.2.2 Guidance

The following guidance is considered relevant:

- Revised Guidelines for Formal Safety Assessment (FSA) for Use in the IMO Rule-Making Process (IMO, 2018);
- International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Guideline G1162 Guidance on the Marking of Offshore Man-Made Structures (IALA, 2021 (a)) and IALA Recommendations O-139 on The Marking of Man-Made Offshore Structures (IALA, 2021 (b)).

13.3 Study Area

The shipping and navigation Study Area has been defined as 10 km around the Marine Project. The Study Area is shown in Figure 13-1.

13.4 Data and Information Sources

Existing data sources to characterise the baseline environment for shipping and navigation are outlined in Table 13-1.

Table 13-1 Summary of key sources of information for shipping and navigation receptors

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
Marine Scotland Data Portal	https://marine.gov.scot/data/marine-scotland-data-portal	2025	Scottish Government
Admiralty Charts (UK Hydrographic Office)	https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal	2025	UKHO
Automatic Identification System (AIS) Data	AIS data including all large commercial vessels (including passenger vessels), large fishing vessels and some recreational vessels allowing preliminary review of primary vessel routes.	2019	Various
Royal National Lifeboat Institution (RNLI) Call-out Data	All RNLI call outs, for any purpose, within the study area. https://data-rnli.opendata.arcgis.com/datasets/rnli-return-of-service/about	2008 to 2017	RNLI
Marine Accident Information Board (MAIB) incident data	This data includes the locations and details of all marine incidents within the study area informing the baseline risk profile.	2020	MAIB

NAME OF SOURCE	DESCRIPTION / LINK	YEAR	AUTHOR
	https://maps.dft.gov.uk/maib-data-portal/web-pages/index.html		
Marine Management Organisation (MMO) Vessel Monitoring System (VMS) data	UK fishing monitoring data utilised by environmental and regulatory organisations to monitor commercial fishing vessel activities. Displayed by fishing effort per ICES rectangles. https://www.gov.uk/government/collections/effort-use-statistics	2019	MMO

13.5 Baseline Environment

13.5.1 Navigational features

The proposed works are contained within the Lerwick Port Authority jurisdiction.

In the vicinity of the proposed works (at approximately one km south) there is one unknown wreck showing a portion of hull or superstructure (ID: 64316); a 50 m archaeological buffer zone will need to be maintained. The location of that wreck is shown in Figure 12-1. The UKHO attribution specifies the wreck as being within 4 m depth. Available information indicates that the wreck was found in 1935 but has not been detected since 1978, indicating it may not exist in its original form anymore. This wreck is not considered to be of historical significance.

There are no other dangerous wrecks in the vicinity of the proposed works (Figure 12-1). Close to the opening in the North Sea there is one foul area i.e. an area where navigation is hazardous due to numerous uncharted dangers.

13.5.2 Vessel traffic

A review of the available data has indicated that the following vessel types are present within the Dales Voe (Scottish Government, 2025a). Data presented are annual average values, and include:

- Tankers (<42 hours per km^2 per month);
- Other (<10 hours per km^2 per month);
- Cargo (<2 hours per km^2 per month);
- Fishing (<0.5 hours per km^2 per month); and,
- Tug and towing (<0.05 hours per km^2 per month).

Vessel tracks can be seen in Figure 13-1.

The Marine Project site and the new jetty will be located approximately 550 m from the Dales Voe decommissioning yard. Vessels typically visit the nearby Dales Voe decommissioning yard for decommissioning purposes, which

requires relatively infrequent, but often complex vessel movements[19]. Dales Voe decommissioning yard is currently planning an expansion, so vessel movements are likely to increase. Lerwick Harbour, though not within Dales Voe itself, is relatively close and operational. Less than one km from the Marine Project site, there is an active shellfish aquaculture farm and it is assumed that vessel transits to and from the Shellfish farm will be taking place related to its operation and maintenance.

The width of the loch at the location of the Marine Project site is 480 m; Dales Voe is a cul de sac (Figure 13-1) and therefore any vessels will need to pass the Marine Project area if they need to get to the end.

13.5.3 Vessel density

Overall, shipping vessel density is relatively low to moderate (annual average for all types of vessels is <50 hours per km^2 per month) within Dales Voe.

[19] *For example, the 382 m Pioneering Spirit has visited Dales Voe on multiple occasions, performing complex manoeuvres to transfer its lift onto the quayside. For the transfer of the Ninian North topsides, the Iron Lady barge was required simultaneously. Also, Buchan Alpha Floating Production Unit (FPU) was towed to Dales Voe using three anchor handling tugs.*

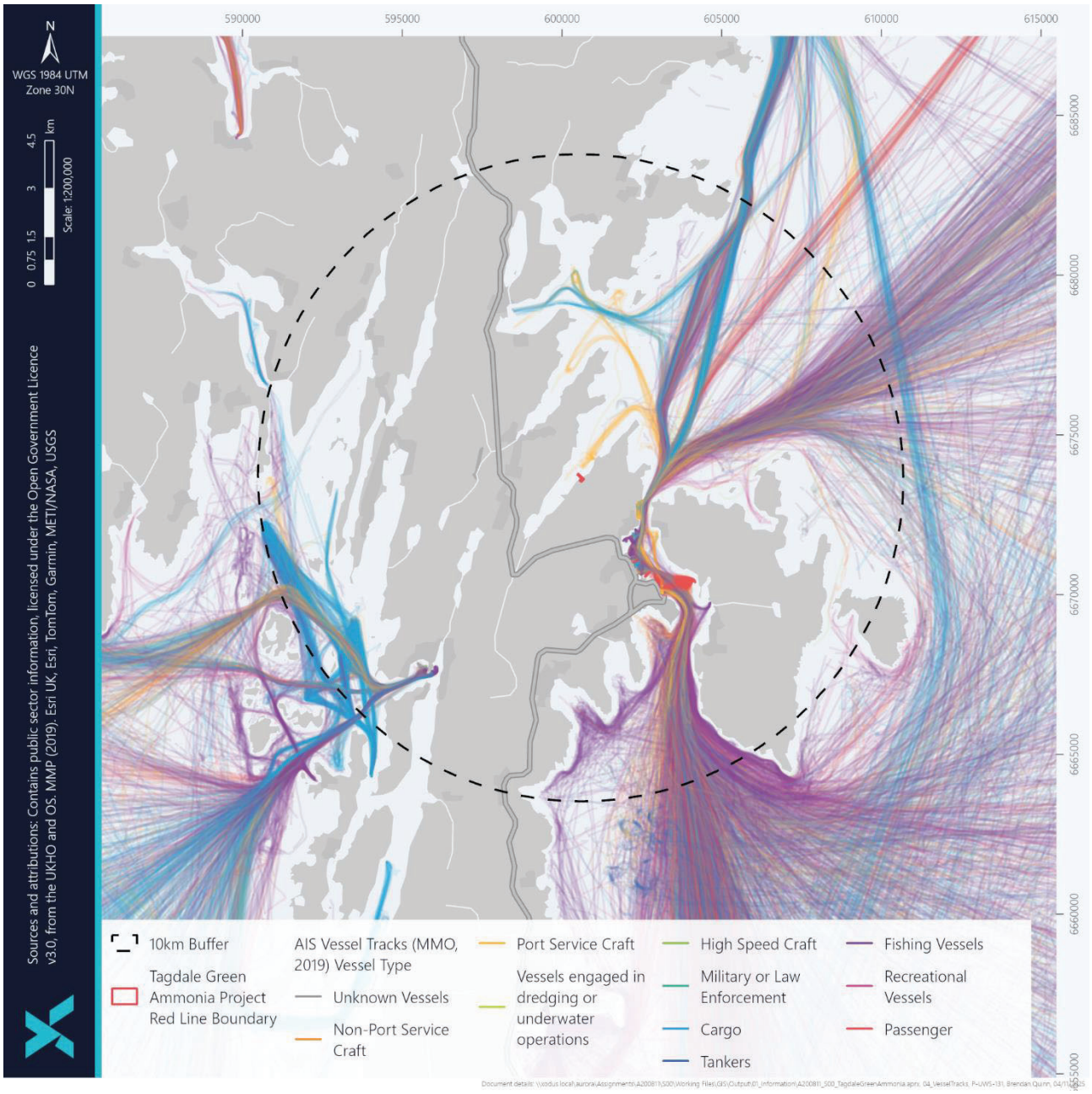

Figure 13-1 Vessel tracks in a radius of 10 km from the Project area. The data visualised was acquired in 2019.

13.6 Embedded Mitigation Proposed

Certain measures have been proposed as part of the Marine Project development process in order to reduce the potential for impacts to shipping and navigation receptors. These measures will follow best practice and are described as follows:

- Notice to Mariners (NtMs), local notifications to marine users, Kingfisher bulletins, Radio Navigational Warnings, and/or broadcast warnings will be promulgated in advance of any proposed works. The notices will include the time and location of any work being carried out, and emergency event procedures;
- Compliance with International Regulations for the Prevention of Collision at Sea (IRPCS) (IMO, 1972) and the SOLAS;
- Appropriate charting on UKHO Admiralty Charts;
- Engagement with Shipping and Navigation Consultees;
- Marking and lighting of the infrastructure in line with International Association of Lighthouse Authorities (IALA) Recommendation O-139 (IALA, 2021b);
- All vessels will comply with the provisions of the International Regulations for the Prevention of Collision at Sea (COLREGs) and the SOLAS (measures included in the VMP).

There is a commitment for the Project to implement these measures and they have been considered within the scoping assessment. The requirement for additional mitigation measures will be dependent on the risk to maritime users and will be consulted upon during the NRA/EIA Report process.

13.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on shipping and navigation during the construction phase:

- Vessel disruption (e.g. vessels associated with Dales Voe decommissioning yard, shellfish aquaculture site) due to construction and/or installation activities;
- Vessel to vessel collision between a 3rd-party vessel and a project vessel.

The following Marine Project activities have the potential to impact on shipping and navigation during the construction phase:

- Vessel disruption (e.g. vessels associated with Dales Voe decommissioning yard, shellfish aquaculture) due to vessel transit (ammonia offloading vessel transits);
- Vessel to vessel collision between a 3rd-party vessel and a project vessel.

13.8 Scoping of Impacts

A number of potential impacts / risks to maritime users have been identified, which may occur during the construction and operation and maintenance phases of the Marine Project. These impacts have been summarised in Table 13-2.

Table 13-2 EIA Scoping Assessment for Shipping and Navigation

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Vessel disruption due to construction, installation and operation activities	Construction	Vessel traffic in the area (e.g., vessels associated with the Dales Voe decommissioning yard, vessels used in the nearby active shellfish aquaculture farm) may be disrupted due to the transit of vessels to be used in the construction phase. Therefore, the impact is scoped in.	Scoped in
	Operation & Maintenance	Vessel traffic in the area (e.g., vessels associated with the Dales Voe decommissioning yard, vessels used in the nearby active shellfish aquaculture farm) may be disrupted due to the transit of vessel used in the transport of ammonia. Therefore, the impact is scoped in.	Scoped in
Vessel to vessel collision between a 3rd-party vessel and a project vessel	Construction	The presence of project vessels during construction may increase the likelihood of vessel to vessel encounters and subsequently increase the collision risk between third-party (e.g. vessels used in the active shellfish aquaculture farm that is found less than 1 km from the Project site) and project vessels. Therefore, the impact is scoped in.	Scoped in
	Operation & Maintenance	Ammonia offloading operation will occur every 15 weeks. The presence of these vessels increase the likelihood of vessel to vessel encounters and subsequently increase the collision risk between third-party (e.g. vessels used in the active shellfish aquaculture farm that is found less than 1 km from the Project site) and project vessels. Therefore, the impact is scoped in.	Scoped in

13.9 Approach to Analysis and Assessment

The assessment of impacts arising from the Marine Project on shipping and navigation will utilise vessel traffic survey data, historical incident data and sources such as those outlined in Table 13-1. These analyses will be augmented by consultation during the NRA / EIA Report phase. A full NRA will be included as part of the EIA, based on a 5 NM study area encompassing the sea area to the east of Shetland.

The Maritime and Coastguard Agency (MCA) supplied 24 weeks (the first 14 days of each month of each year) of type A and type B AIS data on behalf of the MMO. These data will be used to inform the EIA. MAIB and RNLI historical incident data will be updated based on the latest available data at the time of the NRA and assessed in detail to inform the risk. Other data sources will include Admiralty Charts and sailing directions for the area, as well as statistics from nearby ports, harbours and marinas, where available.

Consultation with various stakeholders will also be used to verify the baseline environment to be considered in the assessment, and to identify additional data sources and impacts to be considered in the NRA. In-depth consultation will be undertaken during the NRA / EIA Report process with key stakeholders relevant to shipping and navigation, including:

- MCA;
- Northern Lighthouse Board (NLB);
- RYA Scotland;
- UK Chamber of Shipping;
- RNLI;
- Cruising Association;
- Local ports and harbours e.g., Dales Voe decommissioning yard; Lerwick Harbour
- Regular vessel operators; and
- Local marinas and yacht clubs.

The NRA methodology will be aligned to the provisions of MGN 654 Annex 1, in so far as is appropriate for the Project.

13.9.1 Site-specific survey recommendations

No site-specific surveys are proposed in support of the EIA.

13.10 Summary

The Shipping and Navigation topic will be addressed within the EIA. The following impact is scoped in for further assessment:

- Vessel disruption due to construction, installation and operation activities (construction and operation and maintenance phases); and,

- Vessel to vessel collision between a 3rd-party vessel and a project vessel (construction and operation and maintenance phases).

14 CULTURAL HERITAGE AND MARINE ARCHAEOLOGY

14.1 Introduction

This chapter of the EIA Scoping Report considers the potential effects from construction and operation and maintenance phases of the Marine Project on marine archaeology and cultural heritage[20] receptors. Designated heritage assets that may be encountered in a marine context in Scotland tend to include:

- Wrecks and buried artefacts on the seabed;
- Ancient monuments, which are designated through scheduling;
- Buildings and other structures which are designated through listing;
- Military remains; and,
- Historic MPAs.

The baseline environment and key data sources are described and the methodology that will be used in the EIA to assess the potential effects of the Marine Project on marine cultural heritage is detailed.

14.2 Legislation, Policy and Guidance

The following section summarises the main components of the national legislative framework governing the treatment of relevant historic environment designated assets within the planning process.

14.2.1 Legislation and Policy

The Project is located within 12 NM limit from the Scottish coast. The following relevant legislation is applicable:

- Protection of Military Remains Act 1986 (PMRA 1986); and,
- Merchant Shipping Act 1995 (MSA 1995).

The above legislation provides protection for marine historic assets of national importance, as well as allowing military wrecks and aircraft remains to be protected. The MSA 1995 requires that all wreck material that is recovered is reported to the Receiver of Wreck (RoW).

- Historic Environment Policy Statement for Scotland (HEPS) (2019), includes policies that decisions affecting any part of the historic environment require understanding of its significance and consideration of avoiding or minimising detrimental impacts;
- Scotland's NMP. General Policy 6. Scottish Government, 2015. Historic Environment. Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance."

[20] *Marine cultural heritage assets are defined in the Marine (Scotland) Act 2010, Section 73 (5) as vessels, aircraft, parts of such, contents of such, buildings and other structures, caves, deposits, artefacts or any other thing or groups that evidence previous human activity.*

- Scotland's NMP also recommends that Historic Marine Planning Partnerships and licensing authorities should seek to identify significant historic environment resources at the earliest stages of planning or development process and preserve them in situ wherever feasible. Adverse impacts should be avoided, or, if not possible, minimised and mitigated. Where this is not possible, licensing authorities should require developers to record and advance understanding of the significance of the heritage asset before it is lost, in a manner proportionate to that significance;
- Shetland Islands Marine Regional Plan (2025):
  - Policy MP HIS1: Historic Marine Protected Areas
    - Proposals for marine development and use should consider potential impacts on Historic MPAs and the objectives of the designated site. Where proposals are within or adjacent to the boundaries of any Historic MPA and there are predicted significant effects, the applicant will be required to demonstrate, to the satisfaction of the consenting authority with advice from Historic Environment Scotland: a) that the applicant has considered the preservation objectives of the designated site and there will be no adverse direct or indirect effects on the objectives of the Historic MPA; b) an assessment of the likely impacts of the proposal on hydrodynamic processes and seabed biology/water chemistry over the protected area; and, where appropriate, an archaeological mitigation strategy to minimise any potential impacts. Applicants may be required to arrange for appropriate archaeological investigation, at their own expense to take place prior to the commencement of work, in consultation with the local planning authority (and the Regional Archaeology Service) and Historic Environment Scotland, where appropriate.
  - Policy MP HIS2: Safeguarding Nationally Important Heritage Assets
    - Proposals for marine development and use should protect and, where appropriate, enhance nationally important heritage assets so far as is consistent with the exercise of functions relating to the proposed development or use. Proposals must not result in direct or significant adverse impacts on scheduled monuments or their setting unless exceptional circumstances have been demonstrated and impacts on the monument, or its setting, have been minimised. For all other nationally important heritage assets, where detrimental impact on the heritage asset and/or its setting is demonstrated to be justified and unavoidable, suitable mitigating actions should be identified by the applicant in agreement with the relevant regulator and advisors. If archaeological discoveries are made during marine development and use, there may be a requirement for a professional archaeologist to be granted access to inspect and record them.
  - Policy MP HIS3: Safeguarding Locally Important Heritage Assets
    - All other archaeological resources should be preserved in situ wherever feasible. Where preservation in situ is not possible, applicants should consider the need for appropriate archaeological excavation, recording, analysis, publication and archiving in advance of and/or during development. Where proposals for marine development are within the vicinity of heritage assets, applicants should consider how the proposal design respects the original structure in terms of design, scale and, where appropriate, setting.

- The Convention on the Protection of the Underwater Cultural Heritage is a treaty that was adopted in 2001 by the General Conference of the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The Convention is intended to "protect all traces of human existence having a cultural, historical or archaeological

character" which have been under water for over 100 years. The UK has a stated commitment to use the rules of the Convention as best practice for the management of underwater cultural heritage.

14.2.2 Guidance

There are numerous sources of guidance relevant to maritime archaeology and the development process. Some are described below in chronological order of issue:

- Historic Environment Scotland (HES) (2019) Designation Policy and Selection Guidance, including Annexes;
- HES (2018) Environmental Impact Assessment Handbook;
- The Crown Estate (2021) Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects;
- The Crown Estate (2014) Protocol for Archaeological Discoveries (PAD): Offshore Renewables Projects;
- Wessex Archaeology (2011) Assessing Boats and Ships 1860-1913, 1914-1938 and 1939-1950. Archaeological Desk-Based Assessments (DBA) in 3 volumes;
- JNAPC and Crown Estate (2006). Code of Practice for Seabed Development;
- CIfA, Codes, Standards and Guidance;
- Military Aircraft Crash Sites: Archaeological guidance on their significance and future management (English Heritage (now Historic England), 2002);
- Scottish Government Planning Advice Notes
  - Planning Advice Note 1/2013: Environmental Impact Assessment (amended 2017)
  - Planning Circular 1/2017; Environmental Impact Assessment regulations.
- Aircraft Crash Sites at Sea (Wessex Archaeology, 2008);
- The Code of Practice for Seabed Developers (Joint Nautical Archaeology Policy Committee (JNAPC) and The Crown Estate, 2006);
- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008);
- Our Seas - A shared resource: High level marine objectives (Defra, 2009);
- Ships and Boats: Prehistory to Present: Designation Selection Guide (English Heritage (now Historic England), 2017);
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (Historic England, 2015);
- Managing Change in the Historic Environment: Setting (Historic Environment Scotland (HES) 2016, updated 2020); and,
- Standard and guidance for historic environment DBA (Chartered Institute for Archaeologists (CIfA) 2014, last updated 2020).

14.3 Study Area

An area consisting of a 10 km buffer around the Marine Project site was used as the search area for obtaining records from relevant archive datasets (Section 14.4). This buffer area will be reduced down to 2 km for the EIA, which will encompass the area where any potential impact on marine archaeology receptors may occur in relation to the existing design envelope.

14.4 Data and Information Sources

A review of publicly available information relating to marine archaeological sites in the vicinity of the proposed works and Dales Voe has been conducted in order to inform this assessment. The key sources reviewed are summarised in Table 14-1.

Table 14-1 Summary of key sources of information for archaeology and cultural heritage receptors

NAME OF SOURCE	DESCRIPTION/ LINK	DATE	AUTHOR
The National Record of the Historic Environment (NRHE) of Scotland	Canmore (https://canmore.org.uk/) and Pastmap database (https://pastmap.org.uk/) Maritime records, including documented losses of vessels, and records of terrestrial monuments and findspots, including the archaeological excavation index.	ongoing	HES
UKHO wreck register & nautical charts	https://www.admiralty.co.uk/digital-services/data-solutions/admiralty-marine-data-portal Wreck register and obstructions data including 'dead' and salvaged wrecks that are no longer charted as navigational hazards.	2025	UKHO
Shetland Amenity Trust	Sites and monuments record https://www.shetlandamenity.org/sites-and-monuments-record	2026	Shetland Amenity Trust
Statutory lists, registers and designated areas, including Lists of Scheduled Monuments, Listed Buildings and Historic MPAs	The HES Data Portal https://portal.historicenvironment.scot/ Records of designated heritage assets within Scotland, maintained by HES. Geographic Information System (GIS) data for all Protected Wrecks, Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Registered Battlefields.	ongoing	HES
Shetland Islands Marine Region State of the Environment Assessment	https://www.shetland.uhi.ac.uk/t4-media/one-web/uhi-shetland-images-and-documents/research/document/marine-spatial-planning/state-of-environment-assessment/shetland-state-of-the-marine-environment-assessment-april-17.pdf	2017	Shucksmith
Off Scotland: a comprehensive record of maritime and	Edinburgh: C-Anne Publishing.	1998	Whittaker

NAME OF SOURCE	DESCRIPTION/ LINK	DATE	AUTHOR
aviation losses in Scottish waters			
'Europe's Lost Frontiers: Volume 1	https://www.archaeopress.com/Archaeopress/download/9781803272689	2022	Gaffney, V., and Fitch S.
British Geological Survey (BGS) Borehole Records	Historic borehole logs and the wider geological background for the region https://www.bgs.ac.uk/information-hub/borehole-records/?viewFullSite=yes	Ongoing	British Ecological Survey
Scottish Archaeological Research Framework (ScARF)	The primary resource for Scottish archaeology, one which provides an overview of the subject and a set of relevant research questions to guide assessment. https://scarf.scot/	Ongoing	ScARF
Shetland Amenity Trust	https://www.shetlandamenity.org/	2025	Shetland Amenity Trust

If further primary data is obtained from geophysical surveys covering the proposed Project, an archaeological review and analysis is recommended with a view to identify anthropogenic geophysical anomalies with previously unknown or unconfirmed locations.

14.5 Baseline Environment

14.5.1 Statutory designations

No designated heritage assets are found within, or in the immediate vicinity of, the Study Area.

14.5.2 Seabed prehistory

There are no known submerged prehistoric assets within the Study Area. Therefore, they are scoped out and not considered further.

14.5.3 Wrecks

In the vicinity of the Marine Project (i.e. 0.9 km) there is one wreck showing "any portion of hull or superstructure (ID: 64316)". A minimum 50 m Archaeological Exclusion Zone (AEZ) will need to be maintained around this wreck. There

are no dangerous wrecks in the vicinity of the proposed works (Figure 12-1). Close to the opening in the North Sea there is one foul area i.e. an area where navigation is hazardous due to numerous uncharted dangers. The Marine Project site does not overlap with any Historic MPAs.

14.5.4 Aircrafts

A review of the available data sources show that there are no aircrafts located in the Dales Voe in close proximity to the proposed works.

14.6 Embedded Mitigation proposed

Certain measures have been proposed as part of the Marine Project development process in order to avoid, or reduce, potential impacts to the environment as much as reasonably practicable. Mitigation is likely to focus on addressing direct physical effects to marine cultural heritage assets. This includes prevention of accidental damage or potential destruction to marine cultural heritage assets. The approach to mitigation will be guided by industry best practice and appropriate procedures as laid out in the relevant standards and guidance documents from the CIfA. These measures are described as follows:

- Avoidance of known marine cultural heritage receptor. Seabed preparation, installation activities and installed infrastructure will avoid any identified seabed marine cultural heritage assets through the implementation and monitoring of Archaeological Exclusion Zones (AEZs);
- Archaeological Assessment of Marine Geophysical data for baseline enhancement. It is recommended that in order to enhance the marine archaeology and cultural heritage baseline in order to support effective receptor identification, impact assessment and embedded mitigation, an archaeological assessment of available marine geophysical survey datasets is recommended;
- Protocol for Archaeological Discoveries (PAD) and Written Scheme of Investigation (WSI). If previously unknown sites or material are encountered during the different phases of the Project, measures would be taken to reduce the level of impact. In order to provide for unexpected archaeological discoveries a PAD would be adopted. The PAD is a simple system for reporting and investigating unexpected archaeological discoveries encountered during seabed activities, with a Retained Archaeologist providing guidance and advising on the implementation of the PAD. The PAD also makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection of important features prior to further activities in the vicinity. The PAD provides a mechanism to comply with the MSA 1995, including notification of the RoW, and accords with the Code of Practice for Seabed Developers (2006). A WSI will also be prepared to inform consultation. An outline of the WSI will be submitted with the application.

14.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on cultural heritage and marine archaeology during the construction phase:

- Loss of, or damage to, known marine archaeology and cultural heritage receptors from direct impacts (associated with the installation of the jetty and moorings; anchors and spud cans of vessels);
- Indirect disturbance to marine archaeology and cultural heritage receptors caused by increased SSC and deposition (due to seabed preparation activities, jetty and moorings installation, anchors/spud cans of vessels).

The following Marine Project activities have the potential to impact on cultural heritage and marine archaeology during the operation and maintenance phase:

- Loss of, or damage to, known and unknown marine archaeology and cultural heritage receptors from direct impacts (e.g. anchors of vessels).

14.8 Scoping of Impacts

A number of potential impacts/risks to marine cultural heritage and archaeology have been identified, which may occur during the construction and operation and maintenance phases of the Project. Impacts have been summarised in Table 14-2.

Table 14-2 Potential impacts on marine archaeology during construction, operations and maintenance of the Project

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Loss of or damage to known marine archaeology and cultural heritage receptors from direct impacts	Construction	Available baseline data indicate the presence of one wreck showing any portion of hull or superstructure at an approximate distance of 0.9 km from the Project site. A minimum 50 m AEZ will be maintained around this wreck. PAD and WSI will be adopted. Based on the above the impact is concluded to be negligible and therefore it is scoped out.	Scoped out
Loss of or damage to unknown marine archaeology and cultural heritage receptors from direct impacts	Construction	Available baseline data indicate the presence of one wreck showing any portion of hull or superstructure at an approximate distance of 0.9 km from the Project site. A minimum 50 m AEZ will be maintained around this wreck. PAD and WSI will be adopted. Based on the above the impact is concluded to be negligible and therefore it is scoped out.	Scoped out
Indirect disturbance to marine archaeology and cultural heritage receptors caused by anchoring and mooring systems	Construction	Sedimentation from anchoring and moorings of vessels as well as jetty and moorings installation will be minimal. Available baseline data indication the presence of one wreck showing any portion of hull or superstructure at an approximate distance of 0.9 km from the Project site. A minimum 50 m AEZ will be maintained around this wreck. Based on the above the impact is concluded to be negligible and therefore it is scoped out.	Scoped out
Loss of or damage to known and unknown marine archaeology and cultural heritage receptors from direct impacts	Operation & Maintenance	Available baseline data mention the presence of one wreck showing any portion of hull or superstructure at an approximate distance of 0.9 km from the Project site. A minimum 50 m AEZ will be maintained around this wreck. PAD and WSI will be adopted. Based on the above the impact is concluded to be negligible and therefore it is scoped out.	Scoped out

14.9 Approach to Analysis and Assessment

Cultural heritage and marine archaeology receptors are scoped out of further assessment in the EIA. PAD and WSI will be adopted for the Marine Project.

14.10 Summary

Cultural heritage and marine archaeology receptors are scoped out of further assessment in the EIA.

15 CLIMATE CHANGE AND CARBON

15.1 Introduction

The following chapter outlines the approach to assessment of Greenhouse Gas (GHG) emissions associated with construction, operation and maintenance phases of the Marine Project, the potential risk of climate change to the Project and the way in which projected climate change may modify the significance of the Marine Project on the receiving environment (in-combination climate change impact (ICCI)).

The Project comprises up to 70 MW (nominal) electrolyser units that will produce green hydrogen, which will be further processed into green ammonia using nitrogen extracted from the atmosphere. The total energy demand of the facility will be up to 80 MW. The facility will be powered by wind from the adjacent Mossy Hill Wind Farm and renewable energy from the grid, reducing the use of fossil fuels.

The Project aims to support the Scottish and UK Governments in the achievement of their GHG emissions targets.

15.2 Legislation, Policy and Guidance

15.2.1 Legislation and Policy

The following legislation and policy are considered relevant:

- Scotland's NMP. General Policy 5. Scottish Government, 2015:
  - Climate change. Marine planners and decision makers must act in the way best calculated to mitigate, and adapt to, climate change.
- Shetland Islands Regional Marine Plan (2025).
  - Policy MP CLIM1: Climate Change Mitigation:
    - Proposals for marine development and use should consider climate change mitigation. Applicants may be required to provide supporting information on how the following has been assessed and minimised: a) resource use; b) energy use; and c) greenhouse gas emissions. Applicants should refer to the associated Shetland Islands Regional Marine Plan (SIRMP) Supporting Guidance on Climate Change Mitigation and Adaptation. Applicants should consider adverse impacts on habitats which act as a carbon sink, or which protect against coastal erosion, and how these may be mitigated.
  - Policy MP CLIM2: Climate Change Adaptation:
    - Proposals for marine development and use should consider the current and future risks of climate change on siting, design, and operation over the lifetime of the development and how these can be minimised. Applicants may be required to provide supporting information demonstrating that risks have been considered and minimised and should refer to the associated SIRMP Supporting Guidance on Climate Change Mitigation and Adaptation.

15.2.2 Guidance

The following guidance are considered relevant:

- Climate Change Resilience and Adaptation (IEMA, 2020); and
- Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022).
- Guidance Document for PAS 2080 (ICE, 2023);
- Whole Life Carbon Assessment for the Built Environment (RICS, 2024).

15.3 Study Area

Climate change occurs on a global scale, hence no specific Study Area has been defined for the assessment.

15.4 Data and Information Sources

The existing data sets and literature with relevant coverage to the Marine Project, which have been used to inform this Scoping Report and which will inform the baseline characterisation for the EIA are outlined in Table 15-1.

Table 15-1 Summary of Key Datasets and Reports.

TITLE	SOURCE	YEAR	AUTHOR
Reports prepared and published by Marine Climate Change Impacts Partnership (MCCIP)	https://www.mccip.org.uk/	2020	Various
UKCP18	https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index	2019	Met Office

15.5 Baseline Environment

Each chapter will have a future environmental baseline and will focus on any predicted climatic changes over the operational life of the Project. The future environmental baseline will give consideration to historic climate trends and future climate projections. This assessment will be undertaken with consideration of the data and information sources identified in Table 15-1 and through ongoing engagement with stakeholders which will inform the approach to assessment.

15.6 Embedded Mitigation Proposed

Certain mitigation measures have been proposed across the range of topics assessed within this Scoping Report to reduce the potential impact of the Marine Project on the offshore physical, biological and human environment. It is

anticipated that the embedded mitigation measures adopted as part of these assessments will be sufficient to reduce any potential impacts of climate change during all phases of the Marine Project. There are no specific designed-in measures and management plans proposed in relation to climate change or climate change resilience for the Project.

15.7 Potential Impact Pathways

The following Marine Project activities have the potential to impact on climate and carbon during the construction phase:

- Greenhouse gas emissions from the vessels; embodied carbon in construction materials;

The following Marine Project activities have the potential to impact on climate change and carbon during the operation and maintenance phase:

- Greenhouse gas emissions from the vessels;
- Project infrastructure with vulnerability to climate change; and,
- ICCI .

15.8 Scoping of Impacts

The potential impacts of the Project relating to climate change have been summarised in Table 15-2. This table identifies potential impacts during the construction, operation and maintenance phases of the Project, with a scoping justification and scoping result provided.

Table 15-2 Potential Impacts Relating to Climate Change During Proposed Phases of the Project.

IMPACT	RELEVANT PROJECT PHASE	SCOPING JUSTIFICATION	SCOPED RESULT
Greenhouse gas emissions from the vessels (construction and operation) – Embodied carbon in construction materials	Construction	GHG emissions from vessels to be used in the construction phase and embodied carbon during the construction phase may have an impact on climate. This impact pathway is scoped in for further assessment in the EIA.	Scoped in
	Operation & Maintenance	GHG emissions from vessels to be used during the operation and maintenance phase of the Project are limited. The Project will make an overall contribution towards GHG emission reduction.	Scoped out
Project infrastructure with vulnerability to climate change	Operation & Maintenance	The Project has a minimum operational life of 40 years. First export of ammonia across jetty is expected in early 2030.The magnitude of change over this time period (e.g. sea level rise and storminess) may have an impact on the Project. This impact pathway is scoped in for further assessment in the EIA.	Scoped in
ICCI	Operation & Maintenance	The Project has a minimum operational life of 40 years. The in-combination effect of the Project and climate change may modify the impact of the Project on the receiving environment during the operation phase.	Scoped in

15.9 Approach to Analysis and Assessment

Similar to any development project, the Project will have some GHG, and carbon emissions associated with it. To understand the GHG and carbon emissions related to the construction phase of the Project , a carbon impact assessment will be carried out. This assessment will calculate the embodied carbon of the construction materials used for the development, emission from construction machinery and emission from transportation of the construction materials. The baseline considered will be the 'business as usual' scenario. It considers the carbon emission without the Project at the site.

The Carbon Impact Assessment will take into account IEMA (2022) guidance ('Greenhouse Gas Emissions and Evaluating their Significance').

15.9.1 Site-specific survey recommendations

No site-specific surveys are recommended.

15.10 Summary

The Climate Change and Carbon topic will be addressed within the EIA. The following impacts are scoped in for further assessment:

- Greenhouse gas emissions from the vessels (construction and operation) - Embodied carbon in construction materials (Construction phase only);
- Project infrastructure with vulnerability to climate change (operation and maintenance phase);
- ICCI (operation and maintenance phase).

16 SUMMARY OF POTENTIAL IMPACTS

The environmental chapters within this Scoping Report identified the impacts that will be scoped in and out of the EIA Report. These are detailed in Table 16-1.

Table 16-1 Summary of potential impacts that will be scoped in and out of the EIA Report. Note, the greyed boxes indicate where the impact pathway is not considered to be applicable to the project phase.

IMPACT	CONSTRUCTION		O&M	
	Scoped in	Scoped out	Scoped in	Scoped out
Marine Physical and Coastal Processes - IN				
Impacts on designated features within designated sites		x		x
Changes to coastal processes (includes changes to hydrodynamic, wave and sediment regimes) and nearshore seabed morphology	x		x	
Increase in suspended sediments	x			
Introduction of scour	x		x	
Impacts to stratification				x
Water and Sediment Quality - OUT				
Impacts on water quality status of designated waters		x		x
Changes in water and sediment quality due to accidental discharges from vessels		x		x
Changes in water and sediment quality due to accidental leakage of ammonia				x
Introduction of INNS from vessels				x
Benthic Ecology - IN				
Long-term loss to benthic habitats and species			x	
Temporary habitat loss or disturbance	x		x	
Increased SSCs and associated deposition	x			
Increased risk of introduction and spread of INNS		x		x
Impact to habitats or species as a result of pollution or accidental discharge		x		x
Impacts to habitats or species due to accidental leakage of ammonia				x
Disturbance of contaminated sediments		x		

IMPACT	CONSTRUCTION		O&M	
	Scoped in	Scoped out	Scoped in	Scoped out
Hydrodynamic changes leading to scour around subsea infrastructure				x
Colonisation of hard structures				x
Fish and Shellfish Ecology - IN				
Disturbance or damage to sensitive species due to underwater sound generated from construction activities	x			
Disturbance or damage to sensitive species due to underwater sound generated during the operation and maintenance phase				x
Temporary habitats loss or disturbance during the installation jetty and moorings	x			
Long-term habitat loss or disturbance due to the presence of the jetty and moorings				x
Temporary increases in SSCs and potential sedimentation / smothering on fish and shellfish		x		x
Long term habitat loss due to presence of jetty and moorings on the seabed and associated scour protection				x
Impact to habitats or species as a result of pollution or accidental discharge		x		x
Fish aggregation around the jetty and moorings				x
Marine Mammals - IN				
Noise-related impacts to marine mammals associated with construction/ operational noise, including the risk of injury and disturbance/displacement	x			x
Indirect impacts of construction noise on the prey species of marine mammals		x		x
Vessel disturbance		x		x
Risk of injury resulting from collision of marine mammals with installation vessels		x		
Impacts associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity		x		
Risk of injury resulting from collision of marine mammals with jetty / moorings				x

IMPACT	CONSTRUCTION		O&M	
	Scoped in	Scoped out	Scoped in	Scoped out
Displacement or barrier effects resulting from the physical presence of devices and infrastructure				x
Risk of injury resulting from collision of marine mammals with operations and maintenance vessels				x
Impacts associated with effects upon marine water quality due to any accidental release of pollutants				x
Long term habitat change, including the potential for change in foraging opportunities				x
Ornithology - IN				
Vessel presence (noise, physical presence, lights) leading to disturbance of seabirds and/or their displacement from foraging habitats		x	x	
Noise leading to disturbance of seabirds and/or their displacement from foraging habitat	x			x
Potential change to seabird prey availability (e.g., small fish and squid)		x		x
Potential increase in suspended sediment, leading to reduced visibility and potential for reduced seabird foraging success		x		x
Potential accidental release of pollutants, leading to lethal and sub-lethal effects on seabirds		x		x
Other sea users - IN				
Commercial fisheries				
Displacement of fishing activity into other areas		x		
Interference with fishing activity as a result of increased vessel traffic / obstruction of regular fishing vessel transit routes due to the presence of jetty and moorings		x		x
Displacement to other fishing grounds due to the presence of jetty and moorings				x
Other sea users				
Obstruction of aquaculture activities	x		x	
Shipping and Navigation - IN				
Vessel disruption due to construction, installation and operation activities	x		x	
Vessel to vessel collision between a 3rd-party vessel and a project vessel	x		x	

IMPACT	CONSTRUCTION		O&M	
	Scoped in	Scoped out	Scoped in	Scoped out
Cultural Heritage and Marine Archaeology - OUT				
Loss of or damage to known marine archaeology and cultural heritage receptors from direct impacts		x		
Loss of or damage to unknown marine archaeology and cultural heritage receptors from direct impacts		x		
Indirect disturbance to marine archaeology and cultural heritage receptors caused by anchoring and mooring systems		x		
Loss of or damage to known and unknown marine archaeology and cultural heritage receptors from direct impacts				x
Climate Change and Carbon - IN				
Greenhouse gas emissions from the vessels (construction and operation) – Embodied carbon in construction materials	x			x
Project infrastructure with vulnerability to climate change			x	
ICCI			x	

17 OUTLINE SCHEDULE OF MITIGATION

Table 17-1 details the outline schedule of mitigation for all marine EIA topics.

Table 17-1. Outline Schedule of Mitigation.

TOPIC	EMBEDDED MITIGATION MEASURES
Marine Coastal and Physical Processes	• Prior to installation a scour assessment will be completed to determine the need for protection, and if required, the protection will be installed at construction, thereby mitigating the potential development of scour. No further relevant embedded mitigation is proposed.
Marine Water and Sediment Quality	• Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a Marine Pollution Contingency Plan (MPCP), biosecurity assessment and waste management plan; • Visual inspections to be conducted regularly during the jetty construction to monitor water turbidity caused by increased sediment loading. If a sediment plume is observed which is not readily settling, or is being transported into the wider Dales Voe, additional mitigation (e.g. silt curtain) may be considered. • The Project is designed and constructed to comply with industry good practice for pollution prevention, the above ground infrastructure being secure and only accessible to suitably trained and authorised workers, below ground infrastructure being constructed to suitable standards to minimise the risk of pollution through leakage or accidental release, appropriate inspection and maintenance of pollution prevention measures being implemented during operation of the Project, and all operations being subject to the Health and Safety at Work Act (1974), and regulations made under this Act. During the operational phase, during transport of ammonia, appropriate secondary containment measures will be utilised to reduce the risk of leaks and spillages which will subsequently reduce the likelihood of contamination migrating into the marine environment
Benthic Ecology	• Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a MPCP, biosecurity assessment and waste management plan. • The Project is designed and constructed to comply with industry good practice for pollution prevention, the above ground infrastructure being secure and only accessible to suitably trained and authorised workers, below ground infrastructure being constructed to suitable standards to minimise the risk of pollution through leakage or accidental release, appropriate inspection and maintenance of pollution prevention measures being implemented during operation of the Project, and all operations being subject to the Health and Safety at Work Act (1974), and regulations made under this Act. During the operational phase, during transport of ammonia, appropriate secondary containment measures will be utilised to reduce the risk of leaks and spillages which will subsequently reduce the likelihood of contamination migrating into the marine environment

TOPIC	EMBEDDED MITIGATION MEASURES
Fish and Shellfish Ecology	• Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a MPCP, biosecurity assessment and waste management plan.
Marine Mammals and Other Megafauna	• Production of a CEMP, covering pollution prevention under the MARPOL convention requirements as described within a MPCP, biosecurity assessment and waste management plan; • Adherence to the Scottish Marine Wildlife Watching Code (SNH, 2017) (e.g. vessels will be travelling at slow speeds during construction and O&M activities); • Development and adherence to a Piling Strategy (if required) which delineates the noise mitigation measures to be implemented during any piling activities (e.g., soft-start and ramp-up procedures) to reduce the risk of injury to negligible levels; • Marine Mammal Mitigation Protocol (MMMP) for pile driving, (if required) will be implemented.
Ornithology	• Development and implementation of a Vessel Management Plan (VMP); • Measures to prevent accidental release of contaminants into marine environment including strict observance of MARPOL regulations by all vessel operators (measures to be included in the MPCP); • Vessel management (within VMP) to take into consideration disturbance to birds (e.g., follow guidance provided in the 'Scottish Marine Wildlife Watching Code' (SNH, 2017).
Other Sea Users	• Dissemination of information through: – Notice to Mariners; – Kingfisher bulletins; – Additional appropriate media outlets. • Consultation with all other users of the marine environment likely to be impacted by activities associated with the Project will be consulted with throughout the construction, operation and maintenance phases of the Marine Project. Any maintenance work required during the operation and maintenance phase of the Project will be communicated effectively. • Development and adherence to a Navigational Safety Plan (NSP); • All vessels will comply with the provisions of the International Regulations for the Prevention of Collision at Sea (COLREGs) and the International Regulations for the Safety of Life at Sea (SOLAS) (measures included in the VMP); • Consultation with owners and operators of other marine infrastructure should occur to manage any works undertaken during the construction, operation and maintenance phases of the Project.
Shipping and Navigation	Notice to Mariners (NtMs), local notifications to marine users, Kingfisher bulletins, Radio Navigational Warnings, and/or broadcast warnings will be promulgated in advance of any proposed works. The notices will include the time and location of any work being carried out, and emergency event procedures; • Compliance with International Regulations for the Prevention of Collision at Sea (IRPCS) (IMO, 1972) and SOLAS; • Appropriate charting on UKHO Admiralty Charts; • Engagement with Shipping and Navigation Consultees;

TOPIC	EMBEDDED MITIGATION MEASURES
	Marking and lighting of the infrastructure in line with International Association of Lighthouse Authorities (IALA) Recommendation O-139 (IALA, 2013); All vessels will comply with the provisions of the International Regulations for the Prevention of Collision at Sea (COLREGs) and SOLAS (measures included in the VMP).
Cultural Heritage and marine Archaeology	• Avoidance of known marine cultural heritage receptors: Seabed preparation, installation activities and installed infrastructure will avoid any identified seabed marine cultural heritage assets through the implementation and monitoring of Archaeological Exclusion Zones (AEZs); • Archaeological Assessment of Marine Geophysical data for baseline enhancement. It is recommended that in order to enhance the marine archaeology and cultural heritage baseline in order to support effective receptor identification, impact assessment and embedded mitigation, an archaeological assessment of available marine geophysical survey datasets is recommended; • Protocol for Archaeological Discoveries (PAD) and Written Scheme of Investigation (WSI). If previously unknown sites or material are encountered during the different phases of the Project, measures would be taken to reduce the level of impact. In order to provide for unexpected archaeological discoveries a PAD would be adopted. The PAD is a simple system for reporting and investigating unexpected archaeological discoveries encountered during seabed activities, with a Retained Archaeologist providing guidance and advising on the implementation of the PAD. The PAD also makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection of important features prior to further activities in the vicinity. The PAD provides a mechanism to comply with the Merchant Shipping Act 1995 (MSA 1995), including notification of the Receiver of Wreck, and accords with the Code of Practice for Seabed Developers (2006). A WSI will also be prepared to inform consultation. An outline of the WSI will be submitted with the application.
Climate Change and Carbon	• Certain mitigation measures have been proposed across the range of topics assessed within this Scoping Report to reduce the potential impacts of the Marine Project on the offshore physical, biological and human environment. It is anticipated that the embedded mitigation measures adopted as part of these assessments will be sufficient to reduce any potential impacts of climate change during all phases of the Project. There are no specific designed-in measures and management plans proposed in relation to climate change or climate change resilience for the Project.

18 SUGGESTED STRUCTURE OF THE EIA REPORT

The proposed structure for the EIA Report is provided in Table 18-1. The EIA Report will be produced in line with the legislative requirements in relation to Scotland, and comply with the EIA Regulations and other relevant good practice guidance. For individual topics, it is recognised that they will have their own specific guidance and standards which will be applied in addition to the generic EIA Regulations and good practice guidance.

LSE Screening and Report to Inform Appropriate Assessment will be standalone documents accompanying the EIA.

Table 18-1 Proposed structure for the EIA Report.

CHAPTER	TITLE
Non-technical summary	
1 Introduction and Overview	
1.1	Introduction
1.2	Need for Project
1.3	Legislative Context and Regulatory Requirements
1.4	Site Selection and Consideration of Alternatives
1.5	Project Description
1.6	Stakeholder Engagement
1.7	EIA Methodology
2 EIA Chapters	
2.1	Marine Physical and Coastal Processes
2.2	Benthic Ecology
2.3	Fish and Shellfish Ecology
2.4	Marine Mammals and Other Megafauna
2.5	Ornithology
2.6	Other Sea Users
2.7	Shipping and Navigation
2.8	Climate Change and Carbon
3 Conclusion	
3.1	Summary of Impacts and Mitigations

19 CONCLUDING REMARKS

Statkraft Hydrogen UK proposes the Tagdale Green Ammonia Project, a hydrogen to green ammonia facility of up to 80 MW, located at Dales Voe, Shetland. The project will produce up to 185 tonne/day of green ammonia for decarbonising fertiliser production, maritime fuels, and energy storage.

Marine elements include a new 160 metre export jetty and associated subsea/nearshore infrastructure below MHWS. These components require a Marine Licence under the Marine (Scotland) Act 2010, alongside planning consent for the shore based terrestrial infrastructure.

This Scoping Report establishes for all relevant marine topics a focused set of potential significant effects to be addressed within the EIA Report to accompany the marine licence application. A formal scoping opinion is sought from MD-LOT to inform the EIA Report. Within this scoping exercise a proportionate, evidence-led approach has been adopted focused on topics likely to have credible significant effects on marine receptors due to the works proposed as part of the Marine Project during both construction and operation and maintenance phases. Adoption of the Scoping Opinion issued by MD-LOT within the EIA will support an assessment of the most meaningful potential impact pathways, supporting a targeted and proportionate assessment. A parallel scoping exercise has been performed by the terrestrial EIA contractor with SIC.

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