



Invergordon Service Base Phase 5 Development



Environmental Impact Assessment Report

Volume 1

Non-Technical Summary

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Non-Technical Summary



**PORT OF
CROMARTY
FIRTH**

Phase 5

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1 Introduction

This Environmental Impact Assessment Report has been produced to support construction and dredging marine licence applications for Port of Cromarty Firth's (PoCF) proposed Phase 5 Development of the Invergordon Service Base. The objective of PoCF is to support the Scottish and United Kingdom (UK) governments' stated ambitions to transition to Net Zero (by 2045 and 2050 respectively) by providing facilities that support the growth of the renewable energy sector. The Phase 5 Development will specifically enable PoCF to offer facilities that enable integration of floating offshore wind turbines.

The marine licence application submissions to the Marine Directorate – Licensing and Operations Team are in line with the Marine (Scotland) Act 2010, as amended. The Environmental Impact Assessment Report has been produced to meet the requirements of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended.

This Non-technical Summary outlines the main findings of the Environmental Impact Assessment Report. The Environmental Impact Assessment Report consists of four volumes:

- Volume 1: Non-technical Summary;
- Volume 2: Main Assessment;
- Volume 3: Appendices; and
- Volume 4: Drawings.

Sections of this Non-Technical Summary summarise the chapters included within the Main Assessment provided in Volume 2.

Copies of the full Environmental Impact Assessment Report are available to view at Port of Cromarty Firth, Port Office, Shore Road, Invergordon, IV18 0HD. The building is open between 9am and 5pm, Monday to Friday.

Electronic copies of the full marine licence documents can be downloaded from the PoCF's Phase 5 website (<https://pocf.co.uk/phase-5-safeguarding-port-of-cromarty-firth-for-future-generations/>).

Hardcopies of the Environmental Impact Assessment Report can also be obtained by calling 01349 852308 or emailing port@pocf.co.uk, they will be provided at a cost of £400 plus postage, if required.

If you would like to provide feedback regarding the marine licence applications, then this should be given directly to the Marine Directorate as per the advertised routes.

2 Project Description

2.1 Location

The Invergordon Service Base is located at the town of Invergordon, on the north shore of the Cromarty Firth, 7 miles west of the mouth of the Firth, which is known as the Sutors. Invergordon lies 14 miles north of the city of Inverness, and 65 miles southwest of Wick.

2.2 Project Need

The Cromarty Firth provides a natural deep-water harbour, and it has long been recognised for its potential as a safe deep-water harbour and a national strategic asset. The first land reclamation in Invergordon took place in the 1860s and the area became a 'dockyard port' for the Royal Navy in 1913. With oil reserves being discovered in the North Sea in the early 1970s, the economic opportunities for the Cromarty Firth increased. It was deemed to be in the public interest to encourage further development in the area, and an Act of Parliament formally established the Cromarty Firth Port Authority as a Trust Port in 1973, which now trades under the name PoCF. Since the 1970s, the Invergordon Service Base has grown to support industrial developments and associated jobs in the local area. In order to support the energy industry in Scotland, in particular the oil and gas and renewables industries, the Invergordon Service Base has undergone several phases of development within the last 20 years. In line with its mission as a strategic national asset, PoCF is now pursuing the Phase 5 Development to support the deployment of offshore windfarms and enable the Scottish and UK government obligation of achieving Net Zero.

With the energy transition away from oil and gas, activities supporting that sector have been declining over the past decade and this is expected to continue. At the same time, there has been an increase in onshore and offshore wind activities, which have provided work for local people and businesses. Wind turbines are increasing in size and scale all the time, and the industry is moving to floating technology in deeper waters, which means that ports need to continue to evolve and expand to keep pace and continue to provide the jobs associated with these projects.

The limiting factor in the forward progression of floating offshore wind development in Scotland is the lack of port infrastructure to support integration. The Cromarty Firth has been identified in numerous government and industry reports as the most logical location in Scotland for a strategic offshore wind hub (especially for floating offshore wind). The Invergordon Service Base has very sheltered waters and is in close proximity to many proposed offshore windfarm locations, thus offering the best site nationally for floating turbine integration and pre-commissioning. The Phase 5 Development will attract investment to the local area, providing complementary work scopes and ensuring that floating offshore wind projects are integrated in Scotland.

Thus, the Phase 5 Development could become a vital asset in the future expansion of this industry. Furthermore, PoCF's Phase 5 Development would assist Scotland in adhering to its offshore wind and Net Zero targets through the creation of new facilities for integration of offshore wind structures.

Ongoing discussion with windfarm developers has identified that the Invergordon Service Base is most likely to be utilised for component marshalling for fixed bottom wind projects, floating

offshore wind turbine integration and cold pre-commissioning. As such the design of the Phase 5 Development has aimed to meet the requirements of these operations.

2.3 Consideration of Alternatives

A key part of the Environmental Impact Assessment is to ensure that alternatives have been considered. PoCF developed a number of options based on discussions with the floating offshore wind industry sector with the aim of balancing two key requirements:

- 1) Deep water and long quays to accommodate integration activities; and
- 2) Large laydown areas to accommodate integration, marshalling and manufacturing activities.

Designs that could meet the operational requirements were considered in terms of their potential environmental impacts. Options to develop north of the existing Quay West were discounted due to the potential to change the intertidal habitat on the coastline which is subject to various national and international designations because of its importance to various bird species. It was also recognised that developing west of the existing Quay West, would be further from human and ecological receptors and hence, reduce disturbance effects.

The Consent Design reflects the outcome of years' worth of investigation work understanding environmental considerations and potential user requirements.

2.4 Consent Design

The Phase 5 Development marine licence consent boundary is denoted by the red line in Figure 1. The main elements of the Consent Design are described below.

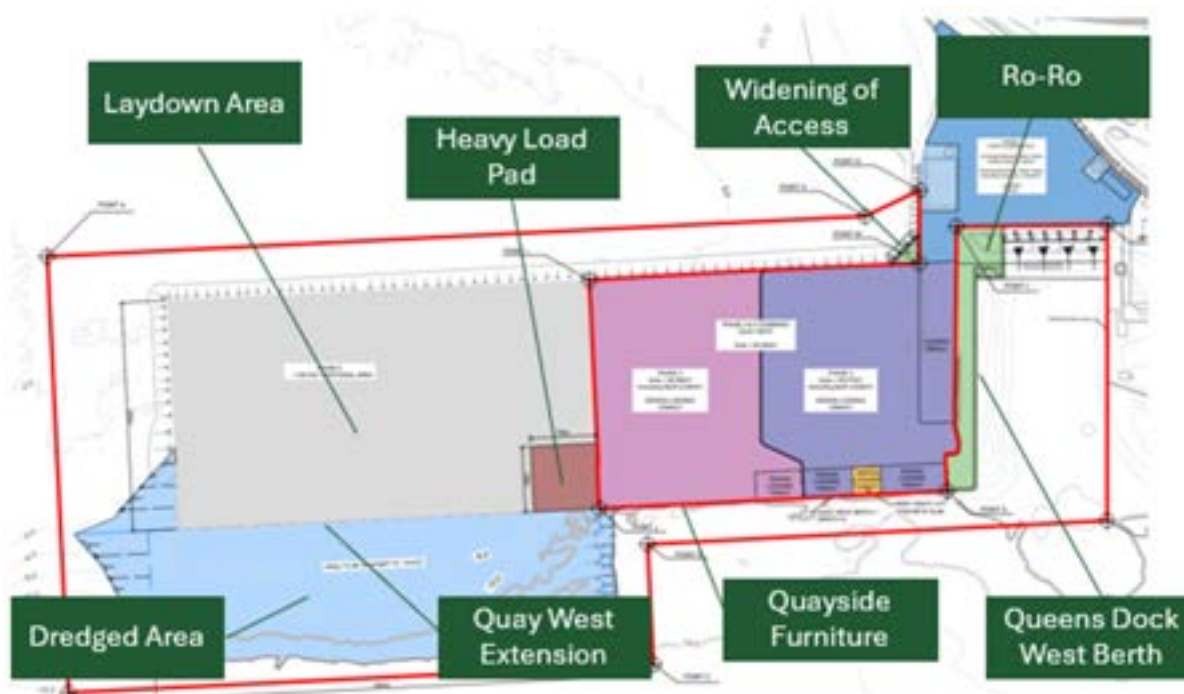


Figure 1: Consent Design Elements

- Quay West Extension: a berth of up to 450m will be constructed as a continuation of the 372m Quay West Berth, to provide up to an 822m long Extended Quay West.
- Laydown Area: reclamation of an additional 11.05 hectares of laydown space to the west of the existing Phase 4 laydown area. The area will offer 15t/sqm load bearing capacity and will be protected on the north and west sides by rock armour.
- Heavy Load Pad: a 70m x 70m heavy load pad (offering 25t/sqm load bearing capacity) will be installed in the southeast corner of the land reclamation area to accommodate a large ring crane.
- Queens Dock West Berth: the removal of rock armour from the eastern corner of Queens Dock to be replaced with a piled wall, creating a 226.5m long berth at Queens Dock and extending Quay West by 30 metres in an easterly direction.
- Roll On Roll Off (Ro-Ro): a 30m wide, 55m long Ro-Ro in the northwest corner of Queens Dock for the unloading of floating offshore wind turbine components.
- Widening of Access to Quay West: a right-angle triangular area of land will be reclaimed at the northeastern corner of Quay West. This will increase vehicle manoeuvrability which is necessary for the safe access of the long vehicles used in the transport of offshore wind components.
- Quayside furniture: navigation lighting, fenders, chains, ladders for personnel access, and bollards for tying up.
- Dredge Area: Area to be dredged to achieve up to -14m water depth.
- Associated services: electrical supply, lighting, water supply, and drainage will all be provided

The Phase 5 Consent Design includes all elements which would ideally be constructed to support the floating offshore wind sector. However, it should be acknowledged that the scale of this development is ambitious and requires substantial financial investment; therefore, not all elements may progress to the construction stage.

2.5 Construction

Construction techniques deployed will be similar to those utilised to build the existing Quay West and will include:

- Dredging
- Rock Armour Removal;
- Revetment Construction;
- Piling for quay walls;
- Infill of land reclamation; and
- Surfacing and Furniture.

2.6 Operations

The Phase 5 Development, like the rest of the Invergordon Service Base, will be a multi-use facility. For the purpose of the assessment, two potential operational scenarios were considered, port activities and floating offshore wind operational scenario.

2.6.1 Port Activities

The Phase 5 Development at the Invergordon Service Base will be a multi-use facility which will be rented out by PoCF, on a project-by-project basis to various tenants to fulfil a range of port-based activities. When a tenant is occupying the Invergordon Service Base, it is the role

of PoCF to ensure that they comply with the PoCF's requirements and regulations, which align with the Port Marine Safety Code, whilst they are utilising the space. Dredging may be required every few years to maintain water depths and to ensure safe use of berths

2.6.2 Floating Offshore Wind Operational Scenario

It is predicted that approximately 25 to 40 turbines could be assembled per year at the Extended Quay West. It is expected that the laydown area will be able to store enough components to build 16 turbines. Up to three floating offshore wind turbines could be accommodated on the Quay: one being integrated utilising a ring crane to lift components onto the sub-structure and two undergoing pre-commissioning activities or awaiting tow-away to the windfarm site.

It is currently assumed that only cold pre-commissioning will be undertaken, whereby the turbine is made ready for operations but is not energised. It is expected that turbines will be free to yaw (turn with the wind) and rotate. The blades will be fully feathered so that they don't catch the wind and only move very slowly at a rate of less than one revolution per minute.

It is unlikely that hot pre-commissioning will occur, as this requires the turbines to be linked up to the national grid, and this infrastructure is not present at the Invergordon Service Base. However, to be fully transparent, this EIA has considered turbine rotations associated with hot pre-commissioning activities in relevant topic areas.

Once pre-commissioning activities are complete, up to three tugs will be used to manoeuvre the complete floating offshore wind turbine from the port, out of the Cromarty Firth and onwards to the windfarm location. As the tow-out of turbines is weather dependant, it is likely that integration and pre-commissioning works will mainly be carried out between March and September. Related turbine integration works will be carried out year-round.

3 Methodology

3.1 Assessment Methodology

In order to determine the possible environmental impacts and likely significant effects that may arise during the construction and operations of the Phase 5 Development an Environmental Impact Assessment was necessary. One of the main purposes of the Environmental Impact Assessment process is to influence and improve the design through iteration. As such, the design of the Phase 5 Development has been heavily influenced by aspects identified through the Environmental Impact Assessment process, including coastal processes and ornithological interests.

An environmental specialist has been involved throughout the design process and, where necessary, appropriate topic experts have been consulted to inform the design further. Subsequently, the proposed infrastructure design avoids or minimises negative impacts wherever practicable, whilst also aiming to maximise positive effects. As such, there are inherent design features (primary mitigation measures), embedded in the proposal, which are assumed to be in place when conducting the initial impact assessment for each environmental topic.

A methodical and robust assessment of environmental impacts has been used across all chapters of the Environmental Impact Assessment Report, with topic-specific variations incorporated as required. The methodology considers a receptor's value or sensitivities, the

magnitude and likelihood of the impact, and through a matrix-based approach, whether or not the impact is significant. If the impact is above a defined threshold, then it is deemed to be significant and additional mitigation measures are put in place where possible to reduce the potential environmental effects. Mitigation to minimise non-significant effects has also been identified in line with best practice.

3.2 Consultation

Consultation has been a key part of the design development and Environmental Impact Assessment process. Over the past ~2 years consultation has been consistently undertaken with a range of key stakeholders. This has been conducted via regular stakeholder meetings, direct engagement with specific stakeholders and through the formal scoping process. This formal scoping process allowed for the content within the Environmental Impact Assessment Report to be agreed ahead of time, such that effort can be focused on areas where significant environmental effects could occur. Local communities have also been consulted over the past number of years, including through a formal Pre-application Consultation event, resulting in the Pre-application Consultation Report, which is submitted with the marine license application.

4 Legislation and Policy

Within an EIA, there are a number of key statutory requirements which require consideration, as well as national, regional and local planning policies. Those most relevant to Phase 5 are discussed in this section.

4.1 Legislative Framework

Marine licences for the construction of PoCF's Phase 5 Development at the Invergordon Service Base and associated dredging will be sought under the Marine (Scotland) Act 2010. It was assumed by PoCF that an Environmental Impact Assessment Report would be required to support the Marine Licence application, under the Marine Works (EIA) (Scotland) Regulations 2017. This is due to the scale of the development and its potential to have a significant effect on the environment.

The Phase 5 Development falls within The Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013. This is because the proposed construction activity within the marine area exceeds 1000m² and will conduct land reclamation of over 10,000m², therefore requiring the project to go through the Pre-application Consultation process. A Pre-application Consultation Report will be submitted in support of the Marine Licence application.

A Habitats Regulations Appraisal is also required when a project potentially affects a European designated site (i.e. a Special Protection Area or a Special Area of Conservation). As the Proposed Development is near to Natura Sites, a Habitats Regulations Appraisal will need to be carried out by the competent authority.

4.2 Policy Context

Planning policy context is set out in relation to both marine and terrestrial landscapes. The Phase 5 Development is wholly in the marine environment, however, as it is located immediately adjacent to land, it is appropriate to consider the terrestrial policy context.

4.2.1 National Marine Plan

The Scottish National Marine Plan lays out the Scottish Ministers' policies for the sustainable development of Scotland's seas and provides General Planning Principles, most of which apply to the proposed Phase 5 Development. In addition, the National Marine Plan lays out sector specific objectives and policies for shipping, ports, harbours and ferries (Scottish Government, 2015). The relevant policies have been reviewed, and it has been identified that the Phase 5 Development meets the General Planning Principle requirements and contributes towards achieving relevant sector specific policies and objectives.

4.2.2 Planning Policy

The development planning system in Scotland, which provides the framework for considering planning applications, is made up of the following main documents:

- The National Planning Framework 4; and
- Local Development Plans.

The National Planning Framework 4 sets out the strategy for long-term development within Scotland. It was published in February 2023 and sets out the strategy for development for the next 20 years (Scottish Government, 2023b).

A key vision of the Highland-wide Local Development Plan is diversification of the economy, which the Invergordon Service Base could support through the growth of renewables (The Highland Council, 2012). The Inner Moray Firth Local Development Plan 2 was adopted in July 2024 and was designed to be read alongside the Highland-wide Local Development Plan supplementary guidance and National Planning Framework. This is to guide successful and tailored development across the Inner Moray Firth Area. The Inner Moray Firth Local Development Plan 2 supports investments in renewable energy and views the Highlands as one of the key locations in Scotland which will help the drive towards Net Zero (The Highland Council, 2024). Relevant planning policies used to support the Environmental Impact Assessment are considered in individual topic chapters.

In addition to the above, The Scottish Government provides advice and technical planning information in the form of Planning Advice Notes and Technical Advice Notes to support the implementation of policies. Where applicable, these have been considered in the relevant sections within this Environmental Impact Assessment Report.

The Scottish Government is also aiming to reduce greenhouse gas emissions (set out in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019). To facilitate this reduction in greenhouse gas emissions, the Scottish Government is supporting an increase in renewable energy, especially floating offshore wind (Scottish Government, 2023a). As such, the PoCF is in an important location to facilitate the integration of the floating offshore wind turbines. It is a key enabler to ensure Net Zero targets are met and to providing energy security through increasing energy production in Scotland.

5 Cumulative Impacts

In an Environmental Impact Assessment, it is necessary to consider the potential for significant environmental impacts or effects of a proposal together with those of other approved projects. As such, a review of planned developments in the local area was conducted in order to identify projects with the potential of generating cumulative impacts with the Phase 5 Development.

Seven projects were identified as requiring consideration:

- The second phase of the Cromlet Park Housing scheme;
- The Housing scheme by Rosskeen House;
- Port of Nigg quayside construction to create a new berthing quay at the Eastern Inner Dock Quay;
- Maintenance dredging at the Port of Nigg and related sea disposal;
- Capital dredging at Ardesier Port and related sea disposal;
- Green Volt Offshore Windfarm and other offshore wind projects; and
- Maintenance dredging at the Invergordon Service Base and related sea disposal.

These projects were identified as having the potential to give rise to cumulative impacts with regard to one or more environmental topics. An assessment to understand the resultant cumulative effects alongside the Phase 5 Development, and any required mitigation, is undertaken in the relevant technical chapters.

6 In-Air Noise

Environmental, or community noise, is a broad term that encompasses noise emitted from many sources, including road, rail and air traffic, industry, construction, public work and neighbourhood noise. All of these sources potentially contribute adversely to the overall noise environment. It is therefore reasonable to expect communities to be sensitive to any increase in noise as a result of a proposed development.

The in-air noise assessment considered the likely significant noise effects associated with the construction and operational scenarios of the Phase 5 Development on nearby residential receptors. The assessment was informed by a baseline noise survey at the closest noise-sensitive receptors (i.e., properties of Invergordon). Only the closest noise-sensitive receptors were considered, on the assumption that if noise levels are within acceptable levels at the closest receptors, then it is reasonable to assume they will also be acceptable at more distant locations.

The assessment for the construction phase modelled monthly scenarios representing construction activities underway in that month. Each scenario simulates the likely overlap of tasks that would occur throughout the construction period and represents the anticipated 'noisiest' activities that will occur. The hours of operation for machinery during construction assumed 07:00 to 19:00 seven days a week for all construction stages, except for dredging which may require 24-hour operations over a concentrated period.

The construction noise levels at all assessed locations during all construction stages are below the daytime, weekend, evening and night-time thresholds adopted for the Phase 4 Development. Day-time construction noise was determined to have a minor impact at all receptors and no significant effects are expected. The assessment concluded impacts during

evenings, weekends and night-time periods would be negligible, similarly resulting in no significant effects.

The noise modelling assumed that all plant is operating concurrently in full operational mode, to provide a worst-case scenario. In reality, only a proportion of the plant may operate for a limited period, hence actual noise levels are expected to be lower than predicted.

The assessment of operational noise levels has been undertaken for the Floating offshore wind operational scenarios taking place on the Extended Quay West area, based on a likely use case for the expanded facilities. Predicted operational noise impacts were considered in the context of the area and concluded to be of minor change, leading to no significant effects of noise associated with the Phase 5 Development. Furthermore, the proposed activities would produce sounds of a similar nature to those currently occurring at the Invergordon Service Base during periods of activity, therefore no new sound characteristics (that aren't already being produced when the Invergordon Service Base is operational) would be introduced to the area.

Though there are no significant effects identified, careful consideration will be given to the type of plant used during each stage to minimise noise during construction and operational phases. Best practice measures will be employed to ensure noise levels are kept to a minimum wherever practicable during the construction and operational phases. Good communication will be maintained throughout the operations on the Invergordon Service Base, for example, notices of noisy works will be posted to residents in advance of activities occurring.

7 Coastal Processes

The Phase 5 Development is entirely located within the marine environment, and hence has the potential to affect coastal processes, flood risk and the status of the coastal water body. This assessment was informed by the results of coastal process modelling, ground investigations, bathymetric surveys and flood risk assessments.

The capital dredging campaign for the construction of the Phase 5 Development will involve the disposal of dredge spoil in the range of 0.6 – 1.8 million tonnes over three years at the Sutors dredge spoil disposal site (the design will dictate the exact amount). A data-based assessment was undertaken to investigate the impact of dredging disposal operations at the Sutors. It was found that the Sutors disposal site offers a highly dispersive environment. There is no indication that disposal operations have caused significant infill of the Sutors disposal site in recent years, nor that the site could not accept greater volumes of maintenance dredging disposal in the future.

The Sutors is located within the Moray Firth Special Area of Conservation designated for subtidal sandbanks. The impact of the dredge disposal on the subtidal sandbanks in the Moray Firth Special Area of Conservation was assessed and impacts were found to be minor and non-significant. The assessment concluded that no significant impacts will occur due to dredge disposal activities associated with the Phase 5 Development.

Three potential impacts have been assessed for the operational phase: changes to water movement; changes to sediment erosion and deposition; and flood risk. Modelling predicted maximum increase in current speeds of approximately 0.27 metres per second, which would occur 200 metres south of the Phase 5 Development. The largest reduction in current speed

is expected immediately adjacent to the Phase 5 Development, where reductions in peak current speed of 0.6 to 0.67 metres per second are predicted. However, the impact magnitude of the current changes was determined to be low (although permanent) giving rise to a minor and non-significant effect.

Overall changes in sediment patterns (erosion and deposition) as a result of the Phase 5 Development are expected to be small and localised. It is likely there will be limited areas of increased erosion and/or deposition as a result of the Phase 5 Development, though impacts were assessed to be minor and non-significant.

The Phase 5 Development area will not connect into the public drainage system, and as such will not impact on surface water drainage of the B817 road, the town of Invergordon or the wider Invergordon Service Base and existing infrastructure. Therefore, it will have no effect on surface water flood risk to other receptors.

No significant effects were identified with regard to the risk of flooding of the Phase 5 Development area. The Phase 5 Development will add a volume of material to the Cromarty Firth. However, due to the connectivity of the Cromarty Firth to the Moray Firth and North Sea, this sea level rise will be negligible. Additionally, the Phase 5 Development will not result in any tangible constriction of the tidal ebb and flow and subsequently, increased risk of flooding was assessed to be negligible and non-significant.

An assessment in line with the Water Framework Directive requirements has been compiled to evaluate changes to the status of the Inner Cromarty Firth and Outer Cromarty Firth water bodies, the boundary of which is straddled by the Invergordon Service Base and Phase 5 Development. No deterioration was found in the chemical, biological or hydromorphological status of the water bodies. Therefore, it is concluded that there will be no reduction in the overall status of either water body.

The dredge disposal site at the Sutors was further considered with regard to potential cumulative effects from interactions with other projects. The quayside construction project at Nigg and maintenance dredging at the Invergordon Service Base will also require dredge disposal at the Sutors, potentially doubling the tonnage of disposed material. To mitigate for these cumulative effects, bathymetric surveys will be undertaken at the end of each dredge disposal campaign to monitor the changes and capacity, and to ensure sufficient capacity in the Sutors for subsequent disposal.

8 Archaeology and Cultural Heritage

An archaeological and cultural heritage assessment was undertaken to identify and mitigate the likely significant effects of the Phase 5 Development on the historic and cultural environment. The assessment was carried out in accordance with standards and guidance published by the Chartered Institute for Archaeologists and with representation from Historic Environment Scotland. The baseline assessment investigated terrestrial and marine assets within the Phase 5 Development site, and within a five-kilometre study area. This assessment involved:

- Review of historical maps and records;
- Review of the marine surveys by a marine archaeologist;
- Site visits;

- Marine geotechnical investigations;
- Assessment of marine geophysical data;
- Assessment of the visual impact of the development on heritage assets in the area; and
- Identification of relevant aerial photographs.

The baseline assessment identified five heritage assets of high relative sensitivity to be considered in the impact assessment including the Symbol Stone at Clach A' Mheirlich, Chapel and Burial Ground at Newhall Point, Old Rosskeen Parish Church and Burial Ground and the Parish Church at Castle Road. Furthermore, 17 Category B and Category C listed buildings of low sensitivity were also taken forward for consideration in the impact assessment, as was the potential for unknown heritage finds or features within the Phase 5 Development site.

This assessment concluded that there are no known archaeological or cultural heritage finds or features within the site boundary of the Phase 5 Development. Hence, no direct impacts are anticipated during the construction or operational phases. However, there is still a potential risk of impacting unknown archaeological remains or heritage finds that may be present. These impacts could arise from the disturbance, removal or destruction of in situ remains and artefacts during construction works, such as the use of anchors or propeller wash.

In accordance with national and local planning policies on heritage, a Protocol for Archaeological Discovery (PAD) (as a minimum) will be produced prior to the commencement of dredging and construction works associated with the Phase 5 Development. The PAD will set out the protocols and procedures that must be followed in the event of any unexpected archaeological discoveries.

In the event of a large find a Written Scheme of Investigation (WSI) may be required and incorporated within the PAD to establish the mitigation procedures that must be followed to avoid damage to cultural heritage assets found during the Phase 5 Development construction works. With the implementation of this mitigation measure, the assessment concludes no significant residual effects are anticipated during the construction of the Phase 5 Development.

Potential effects during the operational phase include the effects on the settings of heritage assets. This is primarily due to the operational effects on the settings from the Phase 5 Development itself and transient visual settings effects caused by marine vessels and mobile infrastructure such as offshore work platforms utilising the Extended Quay West. The impact assessment found that all five heritage assets of high sensitivity would be subject to minor, adverse effects on their setting but these effects are expected to be reversible, and none were deemed to be significant. The primary mitigation for these effects is the design of the development, which is in keeping with current harbour areas and as such, is unlikely to impact the heritage assets further.

9 Landscape and Visual

The Landscape and Visual Impact Assessment considered the effect of the proposed development on the landscape and visual character of the area. The Phase 5 Development is located adjacent to the existing harbour facilities of the Invergordon Service Base within the Port of Cromarty Firth. As such the existing site context is defined by a wide range of industrial and tourism activities.

The assessment considered potential effects during both the construction and operational phases with temporary and permanent scenarios. It also included potential operational scenarios which could be associated with floating offshore wind. A study area of 45 kilometres was defined and agreed with The Highland Council with viewpoints selected using best practice guidance and a number of receptors considered. These included, but were not limited to, landscape character, designated and protected landscapes, areas of recreational, natural or cultural heritage and residents.

The assessment of landscape effects found that the majority of effects on landscape character, landscape designations and other protected landscapes resulting from the Phase 5 Development would not be significant. This includes effects relating to the construction and operation of the permanent elements of the Phase 5 Development. The assessment concluded that it would be seen as a modest extension to existing facilities at the Invergordon Service Base within an existing industrial townscape already influenced by the port operations. This was also the case for the semi-permanent elements associated with the floating offshore wind operational scenario.

Potentially significant effects on landscape receptors would, therefore, relate only to an operational scenario comprising the assembly and integration of temporary floating offshore wind turbine elements. These effects would occur at certain intermittent points during the gradual assembly, sequencing and integration of turbines. As the turbines are incrementally constructed to their full height, the magnitude of effects would vary, ranging from moderate to moderate-major: significant on the host character area (LCT 345: The Farmed and Forested Slopes– Ross and Cromarty), to the north of the Cromarty Firth. These impacts would be limited to specific times during the assembly process of turbines throughout the summer months. A maximum of three turbines could be present at any given time; however, it would be unusual for all three turbines to be fully assembled at the same time. It is more likely that one or two turbines would reach full assembly with the third at various stages of integration. This process would follow a production line approach with continuous change and movement between assembly and pre-integration positions.

While there would be a range of views from the surrounding landscape, including LCT 346: Open Farmed Slope on the Black Isle, this would be in the context of a changing industrial scene within an expansive inner Firth context. This includes oil and gas assets, offshore wind components, cranes and large cruise ships being present on most days. These features add strong focus in the view and combined with the industrial setting at the Invergordon Service Base, would help to moderate the overall magnitude from surrounding character areas.

Thirteen representative viewpoints have formed the basis of the main visual assessment. The assessment has also considered potential visual effects on residential areas within the study area along with transport and recreational routes and also effects of potential aviation lighting at night. The assessment shows that there would only be short term significant effects at two

adjacent points during construction of the Phase 5 Development. These include the nearest settlement edges along King George Street and Cromlet Drive in Invergordon and along a section of the B817 and open space to the west side of Invergordon.

The viewpoints also indicate that there would be no significant effects relating to the permanent elements of the Phase 5 Development where it would be seen as a modest extension to the existing facilities at the Invergordon Service Base, seen in existing baseline views with a range of large industrial features and a constantly changing industrial scene within the Firth.

Beyond these nearest localised points and from most sections of the surrounding study area, the scale and magnitude of effects of the permanent elements of the Phase 5 Development reduces quickly. This is due to the screening effects of intervening landform and settlement from points to the north and south.

With regards to the operational scenarios and the semi-permanent elements, there is potential for some significant effects. These would however be limited to receptors at three viewpoints within Invergordon at King George Street and Cromlet Drive, the recreational areas along the B817 and from Newhall, Balblair on the Black Isle. These are anticipated to be moderate-major and towards the lower end of significance, moderated by the existing baseline. Elsewhere, no significant effects are predicted from semi-permanent elements whereby they would be seen, mostly, as a range of low-lying horizontal elements with components laid flat and within the existing context and changing scene within the PoCF.

The potential for significant effects on visual receptors would therefore relate to the operational scenario comprising the gradual assembly, sequencing and integration of up to three floating offshore wind turbines. Where this is the case, effects would be of varied, temporary, short-term significance, where views are constantly changing as turbines are integrated. This would affect receptors at five of the thirteen viewpoints in the immediate Firth area, within 1.5km to 2km (viewpoints 1, 2 and 4), inland within 3km, settlement areas at Invergordon (viewpoint 3) and the eastern edges of Alness (viewpoint 5). It would be unusual for all three turbines to be present fully assembled at the same time. It is more likely that one or two turbines would reach full assembly with the third at various stages of integration.

Beyond these areas the turbines would be seen in a range of wide panoramas that embrace a variety of landscapes with relative degrees of simplicity and scale in landform and landcover patterns and with a mix of contrasting natural, built and tall industrial elements in the view. This would help reduce the potential for visual complexities and overlap with more distinctive and intricate sections of the surrounding landscape which lie more clearly to the west.

Visual effects would also vary from these locations but would be up to moderate-major and at the lower end of significance when the turbines are fully integrated. This would be moderated by the existing baseline views to the Port of Cromarty Firth. Beyond this area there are no further significant effects predicted from this operational scenario.

While there would be some potential for cumulative effects, the contribution of the Phase 5 Development would not be the notable factor, considering the location of the site within a separate low-lying industrial Firth landscape away from the more rural, elevated and transitional fringe landscapes where the cumulative windfarm sites are present.

10 Socio-economics and Human Health

The economic impact assessments for the construction and operations of the Phase 5 Development are presented for two scenarios: the Consent Design and Option 5A, representing the most and least extensive activities that may be undertaken. The socio-economic assessment for the operational phase is based on the Floating offshore wind operational scenario whereby it is assumed that the operational scenario for the Phase 5 Development includes activities associated with the Inverness and Cromarty Firth Green Freeport, including use of the Invergordon Service Base by the offshore wind industry. Corresponding socio-economic effects have been considered at three spatial scales; Invergordon and Alness, Inverness and Cromarty Firth (i.e., the Inner Moray Firth) and the Highland Council area. The potential implications on human health associated with potential social effects have also been considered as part of this assessment.

Socio-economic impacts during the construction phase will be primarily associated with the creation of jobs, including direct employment, employment through the supply chain and from the induced impacts arising from the spending of wages and salaries. It is anticipated the development will generate an estimated 170-320 Full-time Equivalent jobs, £34.9m-£84.3m of Gross Value Added and £17.6m-£45.3m of income in the Highlands during the construction phase, depending on the realised design. During operations and again, depending on the realised design, the Extended Quay West is assessed as generating an estimated 280-1,000 Full-time Equivalent jobs, £30m-£100m net additional Gross Value Added per annum and £11.9-£47.7m of net additional income per year for the Highland Council Area, for which a vast majority of the net additional economic benefit will be retained within the Inner Moray Firth. Subsequently, expansion of the Invergordon Service Base will provide considerable positive economic impacts during the construction phase and long-term positive effects during the operational phase.

For both the construction and operational phases, the creation of additional jobs, the boost to local incomes and the multiplier effects of this within the local economy can be expected to have subsequent positive social and human health effects. These positive effects will be experienced to varying degrees by individuals, however these effects are not considered to be significant at a local population scale.

The creation of construction jobs will create a need for worker accommodation, which can put pressure on short-term accommodation capacities, but also increase income potential of these facilities due to an increased demand, with associated positive social effects. Due to the availability of short-term accommodation and the short- to medium-term duration of effects, these construction effects are not considered to be significant. Similarly, new workers moving into the area during construction is determined to cause only a potential minor change in demand, or access to, medical services. This would be limited to acute and emergency care services, resulting in a non-significant effect. The creation of construction jobs may have a positive effect on education and training, through the potential for apprenticeships and further training opportunities, though effects are not expected to be significant in the context of the region. As these impacts are not determined to be significant, associated effects on human health are similarly assessed as being non-significant.

The creation of jobs during the operational phase will increase the demand for worker housing and accommodation, potentially leading to negative socio-economic effect by adding

pressure to the housing market. An upper estimate of approximately 1,000 net additional Full-time Equivalent jobs associated with the Extended Quay West gives rise to a potential long-term demand for new housing of 750 new dwellings (as a broad estimate). This is assessed as resulting in a potentially moderate and significant negative effect. The potential for additional pressure on housing availability in the Inner Moray Firth is being addressed through mitigative initiatives by the Highland Council and Inverness and Cromarty Firth Green Freeport at a strategic level. The outcome of which is such that the residual effect on housing demand is determined to be non-significant for the Phase 5 Development.

Pressures from the additional expected demand on housing can have negative effects on social interactions and wellbeing. At the same time, increased demand on housing can lead to improvements in housing stock, with associated beneficial effects on human physical and mental health. Overall, effects of increased accommodation demand on human health are deemed to be neutral and non-significant for the Phase 5 Development.

No significant effects (with regard to socio-economics or human health) are expected from changes in demand on medical services, or changes in demand, or access to, education associated with the operational phase of the Phase 5 Development. However, it is recognised that the creation of jobs may have a positive effect on education and training. In particular, the Skills Plan developed as part of the Inverness and Cromarty Firth Green Freeport will provide additional opportunities and access to training and education. The Skills Plan will raise awareness of careers in the renewables industry and look to support those interested in training and employment, usually corresponding to positive social and human health effects.

Potential changes in the quality of, or access to, social amenities (i.e., open spaces and recreational facilities) during the operational phase were also determined to be non-significant. It is acknowledged that the Residential Visual Amenity Assessment (refer Chapter 9: Landscape and Visual) determined no residential visual amenity thresholds will be breached at any receptors in Invergordon, the Black Isle or further afield. Subsequently, no significant human health effects will be associated with changes to social or residential visual amenity.

Cumulative effects on housing demand were assessed with regard to two future housing developments in Invergordon and Alness. The number of dwellings proposed by these two projects alone are not enough to change the outcome of the significance assessment, but the proposed schemes demonstrate the action and outcomes of the strategic mitigation initiatives underway by The Highland Council, with support from the Inverness and Cromarty Firth Green Freeport and PoCF, to reduce negative impacts.

Under the floating offshore wind operational scenario, the Extended Quay West is predicted to have significant economic impact benefits to the Inner Moray Firth. However, taking into account the wider context of the role an Extended Quay West would play in the multi-port strategy to support offshore wind projects, the proposal will enable Scotland to maximise the economic benefits from the offshore wind sector and accelerate Scotland's progress towards achieving national Net Zero obligations. Hence, the cumulative effects of the floating offshore wind operational scenario with offshore wind projects, is significant for the whole of Scotland (and the UK). The corresponding positive effects on human health, due to increased prosperity and increasing living standards are also recognised.

11 Climate Change

In order to meet greenhouse gas emissions reductions targets, action is required to reduce emissions from all sectors, including construction projects. This chapter presents a proportionate assessment of the greenhouse gas emissions associated with the Phase 5 Development. This assessment follows the Institute of Environmental Management and Assessment guidance and uses a Life Cycle Assessment approach to comprehensively evaluate the emissions associated with the Phase 5 Development.

Scots law sets ambitious targets for reducing greenhouse gas emissions, aligning with the Paris Agreement which is a legally binding international treaty that aims to reduce greenhouse gas emissions and adapt to the effects of global climate change. Various national policies also seek to ensure that development projects contribute to reducing emissions.

It is recognised that the Phase 5 Development has inherent greenhouse gas emissions associated with all phases of its lifecycle. The design process sought to align with the relevant legislation and policy insofar as it is possible to do so. However, it is also noted that the Phase 5 Development contributes to the effort to reduce societal greenhouse gas emissions and move towards Net Zero, therefore aligning to the legislation and policy by virtue of facilitating the development of renewable offshore wind energy production.

Using UK Government conversion factors and taking into account reasonable assumptions, a carbon dioxide equivalent was calculated for each emission source associated with the Phase 5 Development construction works. The total carbon dioxide equivalent for the materials requirements, transport of those materials to the project site and estimated plant use is 197,236 tonnes, based on a worst-case scenario. This is equivalent to 0.49 percent of the carbon footprint for the whole of Scotland in 2022 (Scottish Government, 2023c). It should be borne in mind that the development will last decades, and as such, the associated carbon dioxide equivalent should be spread over the development's lifespan, which is likely to be in excess of 50 years.

The main element of the design yet to be finalised is the construction method of the heavy load pad. The carbon dioxide equivalent estimated could decrease by approximately 32,500 tonnes if the heavy load pad is constructed using concrete, rather than steel, piles. This is a substantial reduction and would reduce the overall carbon dioxide equivalent of the project to approximately 165,000 tonnes.

The operational phase of the Phase 5 Development will require minimal ongoing activities attributable to PoCF. Maintenance dredging will be undertaken every 3-4 years, however, the volumes associated with the maintenance regime will be much smaller than those associated with the capital dredging. Operational electricity requirements, to provide lighting and other services, will be minimal. A hypothetical quantitative approach has been adopted to calculate the carbon dioxide equivalent associated with these aspects of the operations, for which the result is 56.07 tonnes per annum.

The Phase 5 Development operations will largely be carried out by third party tenants and their greenhouse gas emissions are not attributable to the project. However, it is recognised that the Phase 5 Development is facilitating the construction of large, fixed bottom and floating offshore windfarms, which form an integral part of wider government strategy to achieve the emissions reductions targets. The floating offshore windfarms in question,

licensed under the Scotwind and Innovation and Targeted Oil and Gas seabed leasing rounds, will generate 19.2 gigawatts of electricity. Hence, whilst no quantitative assessment has been undertaken, it is a reasonable assumption that the overall impact of the Phase 5 Development on global greenhouse gas emissions will be positive.

Decommissioning of the Phase 5 Development is thought to be an unlikely occurrence. Numbers presented here are estimates only but serve to illustrate that even in the unlikely event of decommissioning, recycling and reuse of the materials could result in reduced greenhouse gas emissions of future projects. The magnitude of these savings (in the order of 80,000 tonnes) far outweighs the emissions associated with other aspects of decommissioning. During decommissioning, recycling and reusing materials can further reduce emissions.

Based on a whole lifecycle approach, the Phase 5 Development will provide an overwhelmingly positive contribution to achieving Scotland's national and international emissions reductions targets, and ultimately to achieving Net Zero. This beneficial impact is reliant on the predicted increase in both fixed bottom and floating offshore wind in the coming years. Hence, it can be concluded that overall, the Phase 5 Development will have a significant beneficial impact on greenhouse gas emissions.

12 Biodiversity

The range of biodiversity receptors which may be affected by the proposed Phase 5 Development are discussed in Chapters 13: Ornithology and 14: Marine Biodiversity. Chapter 12: Biodiversity lays out the legislation, policies, guidance and designated sites which are in place to protect biodiversity and are applicable to the assessments within the aforementioned ecology chapters.

This chapter also outlines the impact assessment methodology which has been followed through the ecological impact assessments of Chapters 13: Ornithology and 14: Marine Biodiversity.

As agreed through the Environmental Impact Assessment scoping process, three other documents have been developed to support the protection of biodiversity:

- A site-based Biosecurity Management Plan to minimise the risk of introduction and spread of marine invasive non-native species populations during the proposed development. Port of Cromarty Firth Biosecurity Plan has been provided in Appendix L.1. Annex 1 of the plan specifically considers Biosecurity associated with the construction of the Phase 5 Development.
- A Tern Management Plan to safeguard Arctic and common tern at the Port of Cromarty Firth. This is provided in Appendix M.5.
- A Habitats Regulations Appraisal to assess likely significant effect to species and habitats associated with European Sites. This is to ensure compliance with the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) and is provided in Appendix L.2.

13 Ornithology

There are several designated sites relevant to the Phase 5 Development which have been designated specifically for ornithological interests. The development sits directly adjacent to the Cromarty Firth Special Protection Area, Ramsar Site and Site of Special Scientific Interest, which are designated for breeding common tern and osprey, as well as for a variety of wintering waterfowl and wader species.

To assess the potential impacts on the ornithological receptors at the site, as well as the potential impacts the proposed development could have on the Cromarty Firth Special Protection Area, Ramsar Site, Site of Special Scientific Interest and other nearby designated sites, a combination of field surveys and a comprehensive desktop study was carried out. Species specific data from breeding bird survey reports covering eider, common and Arctic tern, written on behalf of the Royal Society for the Protection of Birds, were used to understand their nesting habits at the Invergordon Service Base over the last 10 years. These reports showed that there was a high degree of variability in where tern nest around the Invergordon Service Base, while their presence within the broader area is consistent. Breeding bird surveys, carried out by sub-contractors, were used to confirm the presence of species not included in the surveys completed on behalf of the Royal Society for the Protection of Birds. Further winter bird surveys, collating four years of data, were completed to provide a full picture of the ornithological diversity around the Invergordon Service Base in different seasons.

Vantage point surveys, undertaken from December 2023 to September 2024, confirmed the presence of 28 species, the most active of which were common gull, herring gull, pink-footed goose, greylag goose and oystercatcher. The survey methodology is primarily suitable for onshore windfarms but includes guidance on coastal species. Given that any potentially erected wind turbines at the Invergordon Service Base will essentially be tethered to land, this methodology was considered suitable. The data collected during the vantage point surveys was used to create a collision risk model for the presence of wind turbines at the port and a separate report covering the findings of the surveys.

During the construction period of the Phase 5 Development, birds have the potential to be receptors to the following impacts: habitat modification in subtidal and operational areas; visual and auditory disturbance from increased human activity; accidental physical injury or mortality from machinery and vehicles; nest site destruction or abandonment; and the accidental introduction or spread of Highly Pathogenic Avian Influenza. The effects of disturbance and accidental physical injury or mortality on all species are expected to be minor and non-significant or less. This is also expected to be the case for habitat modification and nest site destruction and abandonment for all species except tern, where a major significant effect is expected in both cases. The effect of Highly Pathogenic Avian Influenza could range from minor non-significant to major significant, depending on the value of the species. Mitigation measures for birds will include but are not limited to a Species Protection Plan; a Tern Management Plan; nesting bird exclusion zones around the port; and the removal of nesting habitat during the non-breeding season. The implementation of these measures is expected to result in effects being no higher than minor non-significant.

During the operational phase, accidental physical injury or mortality, and visual and auditory disturbance from increased human activity were the impacts considered on local birdlife. In both cases these were found to have no effect higher than minor non-significant.

14 Marine Biodiversity

The Phase 5 Development is situated in the Cromarty Firth, an area (along with the wider Moray Firth) renowned for its importance to marine mammals. Protected areas identified as being relevant to the Phase 5 Development include the Moray Firth Special Area of Conservation, and the Dornoch Firth and Morrich More Special Area of Conservation and the Southern Trench Marine Protected Area, designated for bottlenose dolphins, minke whales and harbour seals respectively. The designated seal haul out sites, including the Cromarty Firth, Ardersier and Findhorn haul outs, have also been identified as relevant to the Phase 5 Development.

A comprehensive desktop study of the current scientific literature was conducted in order to identify which marine mammal receptors may be affected by the Phase 5 Development. The study included a review of the Phase 4 Development Environmental Impact Assessment Report which included marine mammal observation and passive acoustic monitoring data collated during the construction of the Phase 3 Development of the Invergordon Service Base. It was established that the marine mammal species most likely to be present in the development area include bottlenose dolphin, harbour porpoise and harbour seal. Bottlenose dolphins are identified as being regular visitors to the area, although the Sutors, located approximately 11 kilometres to the east (at the entrance to the Cromarty Firth), is considered to provide more valuable habitat to dolphins than the Phase 5 Development area. Minke whales, common dolphin and grey seals were identified as generally being present in the wider Moray Firth.

Underwater noise modelling was carried out to understand the impact of piling on marine mammals resulting from underwater noise. During construction, there is the potential for impact piling to result in underwater noise levels which could cause injury to marine mammals along with disturbance as a result of an increase in the number of vessels, injury during dredge disposal and foraging impairment due to increased water column sediment loading during dredging operations. Of these impacts considered and assessed, only two effects resulting from the construction phase were assessed as having the potential to result in moderate significant impacts in the absence of specific marine mammal mitigation. These were injury and disturbance due to underwater piling noise, and injury resulting from interaction with dredged spoil disposal operations at the Sutors. To mitigate these potential impacts on marine mammals, marine mammal monitoring and passive acoustic monitoring protocols will be employed to ensure marine mammals are not present in the zone where injury is likely to occur, prior to the operation commencing. The marine mammal mitigation protocols are detailed within the chapter and will be implemented through the Construction Environmental Management Document.

With the implementation of mitigation measures, the residual impacts on marine mammals associated with construction are assessed as minor and non-significant. During the operational phase, there is the potential for marine mammal impacts associated with increased vessel movements, underwater noise, water quality and habitat loss. Of these impacts considered and assessed, none were identified as significant. A review was undertaken assessing the impacts of cumulative effects with other developments being carried out in the area with the potential for overlap during construction and operational phases. No significant cumulative effects were identified.

Chapter 14: Marine Biodiversity also assessed the impacts of underwater noise as a result of piling on diadromous fish, species which spend part of their lives in freshwater and part in salt

water. No other impacts on fish required assessment as was agreed during scoping. A number of rivers feed into the Cromarty Firth and the waterbody therefore acts as a migration route for diadromous species including Atlantic salmon, sea trout and the European eel. No significant impacts were identified on fish as a result of underwater noise arising from impact piling. To mitigate the previously identified significant effect during the Phase 4 Development upon Atlantic salmon smolt outward migration, dredging and spoil disposal operations will be prohibited during the month of May. No significant effects for diadromous fish are therefore anticipated as a result of the proposed Phase 5 Development. Cumulative effects on diadromous fish were considered with no effects expected.

15 Traffic, Transport and Navigation

During the construction of the Phase 5 Development and the operational Floating offshore wind scenario, there is a need to transport both people and materials to site. While some construction materials are to be delivered by road, deliveries of oversized materials (which would be classed as abnormal loads) are anticipated to arrive by sea. The majority of movements during the operational scenario will be by sea.

In terms of road traffic, the impact assessment methodology involved a screening exercise to determine whether changes in traffic flows or Heavy Goods Vehicle movements required a detailed assessment. The study area included local roads that are likely to experience increased traffic flows resulting from the Phase 5 Development. The upper limit of road deliveries associated with the maximum construction scenario were calculated and after screening, only one road required a detailed assessment for the construction phase, the Struie. The route along the Struie includes Ardross Primary School and sees an elevated number of cyclists potentially using this stretch of road. Due to an increase of Heavy Goods Vehicle movements on this road, it was deemed appropriate to undertake a detailed assessment, which resulted in no identified significant impacts. Nevertheless, mitigations will be implemented to recognise best practice, particularly in relation to the school.

Transport and active travel provision were considered for the temporary increase in workforce during the construction phase. The temporary increase in usage of the existing public transport network is not predicted to have any tangible impact on public transport users or availability, and existing transport services and active travel provisions are expected to be able to accommodate the additional demand without perceptible changes in conditions for existing service users.

Large items associated with the construction material deliveries are anticipated to be made by sea and not use the road network. If abnormal loads are required to be delivered to the Invergordon Service Base, the appropriate legislation will be complied with.

Impacts on traffic and transport will be minimised through the implementation of a Construction Traffic Management Plan, to ensure that construction traffic is appropriately managed to minimise effects primarily associated with Heavy Goods Vehicles.

With respect to the Phase 5 Development floating offshore wind operational scenario, due to the scale of floating offshore wind turbine components, the majority of movements will be by sea. As such, traffic and transport movements are limited to personnel attending the site. The assessment concluded that the increase in vehicle traffic associated with the operational scenario will not breach the threshold to justify a detailed traffic assessment. It was concluded

transport of personnel attending the site is unlikely to have a significant impact on the local road network.

Furthermore, an increasing number of employees are expected to travel to work by public transport. PoCF will encourage and facilitate for floating offshore wind developers to work with public transport providers to allow for the development of public transport provisions which will service the requirements of both shift and office employees.

To mitigate against any potential traffic impacts, a Construction Traffic Management Plan will be developed to ensure that construction traffic is appropriately managed and a suitable communication link with Ardross Primary School is established.

Abnormal load considerations showed that wind turbine components will be delivered and offloaded by sea, and as such, it is not anticipated that any routine abnormal loads will arrive by road to the Invergordon Service Base during the floating offshore wind operational scenario.

Considerations of public transport, parking provision and active travel also concluded no significant effects are expected under the floating offshore wind operational scenario.

For the navigation impact assessment, potential additional vessel movements associated with the construction and operational phase (i.e., the floating offshore wind operational scenario) were considered. These were compared to baseline conditions, to give an understanding of the level of change in vessel movement, and hence, PoCF's ability to manage the movements.

The total one-way vessel movements through and in the Firth, as associated with the construction phase, are calculated to be in the region of 272 movements over the 2.25-to-3-year construction period, giving rise to between 90 and 120 movements a year. These numbers are within the range of those previously safely managed by PoCF. As increases in vessels associated with the Phase 5 construction works will not give rise to movements higher than those previously arising, the construction works are considered to have no change on vessel movements, and the anticipated additional vessel movements are determined to be within manageable limits of PoCF.

In terms of navigation and vessel movements within the Cromarty Firth, the floating offshore wind operational scenario is very similar to projects PoCF are used to accommodating. Given that floating offshore wind projects are likely to replace projects undertaken at the Invergordon Service Base as opposed to being an entirely additional activity, the associated vessel movements during the floating offshore wind operational scenario are classed as having no change from baseline.

An Initial Navigational Risk Assessment has been completed for both the construction phase and the floating offshore wind operational scenario (provided in Appendix O.1). This Initial Navigation Risk Assessment will be updated prior to both the construction phase (in the form of a Construction Navigation Risk Assessment) and operational phases to take account of specific details once they are available.

In conclusion, the roads and navigational channels are of an appropriate standard and have enough additional capacity to accommodate the potential increase in vehicle and vessel movements associated with the Phase 5 Development construction and floating offshore wind operational scenario.

16 Aviation

Due to its low-lying nature, the construction of the Phase 5 Development will not impact aviation. During operations the Extended Quay West is likely to be used for the integration of floating offshore wind turbines. These turbines could have tip heights of 330m (1082ft), hence there is a need to consider whether they pose a risk to aircrafts, or to the radar and communication systems the aircrafts rely on.

A desk-based assessment was undertaken to identify the aviation context and assets in the area that may be impacted by tall turbines. Airports, airfields and helipads within the study area were identified, alongside radar and radio masts used for communications. Consideration was also given to flight paths and routes. It was noted that it is not uncommon for aircraft to fly over the Cromarty Firth, with helicopters and leisure aircraft more likely to be flying at low heights.

Once floating offshore wind turbines are pre-commissioned, they will be taken from the Extended Quay West out through the Cromarty Firth to the Moray Firth and onward to their destination windfarm site. All aircraft have to follow the Rules of the Air, which include the need to complete route plans and to fly at certain heights above ground, water and obstacles. As part of the flight planning process, Notices to Aviation (which provide information on temporary hazards), are reviewed. Notices to Aviation will be issued to ensure that pilots are aware of turbines located at the Extended Quay West or being towed to windfarm sites. With these Notices to Aviation in place, the risk of an aircraft colliding with a wind turbine is extremely low.

Furthermore, PoCF have engaged with Highlands and Islands Aviation Ltd, who are undertaking an initial safeguarding assessment. This exercise will identify if there is a potential to affect their Instrument Flight Procedures, radar or electronic aids to navigation. Highlands and Islands Aviation Ltd will consider if there is a potential for their signals to be reflected and/or diffracted by the wind turbine blades. If it is determined that this could potentially occur, then there are techniques that can be deployed to mitigate the effects.

It is acknowledged that the specific effects on aviation will be determined by the particulars of the turbines being integrated and their exact locations. The initial safeguarding assessment will give an understanding of the potential for issues, but specific considerations will be required. To facilitate this, a nine-step route map has been developed for floating offshore wind developers to follow when they are planning to use the Extended Quay West for fully assembled floating offshore wind turbines. The route map has been developed to ensure that appropriate engagement with aviation stakeholders is conducted, to allow any safeguarding issues to be mitigated.

Proactively engaging with the aviation sector, prior to floating offshore wind projects commencing, will enable the implementation of safeguarding assessments and mitigation measures. In addition, issuing Notices to Aviation for all assembled turbine locations and movements will help ensure that there will be no significant effects on aviation.

17 Major Accidents and Disasters

It is common for major accidents and disasters to be considered for new developments. Major accidents can be caused by disasters resulting from both man-made and natural hazards. Hence, the assessment of major accidents and disasters considers the impact of external events on the development, and if the development could be the source of a disaster. It is recognised that existing legislation, standards and guidance are sufficient to mitigate against the majority of disasters and hence, attention is focused on those less understood hazards.

In this instance Marine Directorate specifically requested that the Environmental Impact Assessment consider any potential hazards associated with the floating offshore wind operational scenario, recognising this will include the movement of large structures through the Cromarty Firth, and a range of activities at the Extended Quay West.

A review of external disasters including extreme weather events, earthquakes, terror attacks, transport incidents and external hazards associated with other facilities was undertaken. This review did not identify anything that could give rise to a major accident on the Phase 5 Development.

In parallel, a hazard identification workshop identified four groups of hazards for further consideration:

- Navigational risk associated with the movement of floating offshore wind turbines, (noting that these will need up to three tugs to manoeuvre them safely through the Cromarty Firth);
- Dropping a load (noting that there will be crane lifts required to unload components from vessels and to integrate wind turbines) and collapse of a crane or turbine (part of);
- Collision between crane, turbine blades and vessels, noting that they could all be moving in close proximity to each other; and
- Fire.

A Navigation Technical Feasibility Assessment was completed. It considered seven different activities to ensure that all the vessel movements required by a floating offshore wind project in the Firth could be carried out, without conflicting with other users of the Cromarty Firth. The assessment demonstrated that all activities could be undertaken without causing issues to other operations including cruise ship movements and operations.

Consideration of clashes between turbine blades, cranes and component delivery vessels showed that with appropriate management issues could be avoided. Although there is a need to consider project specifics once they become available.

With regard to drop load and collapse of crane, it was recognised that there is existing legislation, guidance and standards in place to minimise the risk of occurrence, including the Lifting Operations and Lifting Equipment Regulations which place duties on companies who utilise lifting equipment to ensure they operate safely. Furthermore, when the dimensions of the cranes and location of the activities being undertaken are considered, in the unlikely event that there were a drop load or crane collapse, it would not affect publicly accessible areas.

With regard to the floating offshore turbines and their substructures, they are designed to appropriate standards and are subject to certification to demonstrate they can withstand the

environmental conditions they will experience on location at the windfarm site. This provides the confidence that catastrophic failure is highly unlikely within the port. As with the cranes, in the highly unlikely event that they were to collapse then they would not affect publicly accessible areas because of their location at the extended Quay West.

Fires in wind turbines can start due to a combination of electrical, mechanical, and environmental factors. However, as the turbines will not be rotating and generating power as they would when on site at the windfarm, they are much less likely to experience a failure. It is also acknowledged that personnel will be on site 24/7 during operations. As a result, if a fire were to start anywhere on site, it would be quickly detected, allowing for a prompt response to contain and extinguish it. This greatly reduces the likelihood of a fire escalating to a scale that would give rise to a major accident.

Hence, it has been concluded that there are no scenarios which would give rise to a major accident or disaster associated with the Phase 5 Development floating offshore wind operational scenario. Furthermore, risks can be appropriately managed by conforming to existing legislation and adhering to existing standards and guidance.

18 Schedule of Mitigation

Mitigation measures which have been identified throughout the Environmental Impact Assessment Report, are collated to form the Schedule of Mitigation. These are further broken down into construction, operations and floating offshore wind operational scenario mitigations.

Construction mitigation measures include mitigation identified for topics such as dust and water quality, which were not specifically considered in the Environmental Impact Assessment Report. These were originally identified during the scoping stage of the project and their implementation will ensure effects are minimised.

As to how mitigation measures will be implemented, this is detailed in the Construction Environmental Management Document. This will be used during the planning and implementation of the construction phase by the construction contractor. The Construction Environmental Management Document can also be updated as and when necessary. A key inclusion within the Construction Environmental Management Document, is the requirement for use of appropriately trained and experienced staff, to ensure mitigation measures are effectively implemented. This will include an Environmental Clerk of Works (ECoW) whose role it is to provide onsite supervision to ensure the environmental mitigation measures are implemented appropriately and are working effectively, they will also provide advice as issues arise.

Operational mitigation measures will be incorporated into PoCF's existing management systems, as required, to ensure that they are implemented appropriately. PoCF will work with offshore wind developers to ensure that mitigation measures specific to their projects are adequately implemented.

19 Conclusions

The Phase 5 Development Consent Design has been fully assessed to understand the potential environmental impacts associated with all lifecycle phases. During the construction phase, there is potential for significant impacts on birds and marine mammals. However, in all cases, mitigation measures can be implemented to avoid or greatly reduce the impacts. As such with mitigation in place, no significant effects are predicted for the construction works.

If the Queens Dock West Berth is constructed, potential nesting Arctic and common tern habitat could be lost. Mitigation in the form of alternative habitat provision for tern will, however, reduce the effect to non-significant levels.

Significant landscape and visual impacts have been identified for the operational phase. Operations excluding the floating offshore wind scenario are visually significant for local residents of King George St and Cromlet Drive and recreational areas along the B817, known locally as Linear Park. The landscape and visual impact assessment considered two floating offshore wind scenarios, without wind turbines on the berths (Scenario 1) and with turbines being integrated and pre-commissioned on the berths (Scenario 2). This was in recognition that integration and pre-commissioning may not be undertaken through the winter months. As noted in Table 19.1 both scenarios give rise to significant impacts, however, the number of receptors affected increases for Scenario 2 as the tall turbines are visible from more places.

That said, the floating offshore wind operational scenario of the proposed Phase 5 Development would bring substantial benefits to both the local and regional economy. The significant effects arising were recognised in the assessment and are highlighted in Table 19.1. The increase in jobs was recognised as putting additional demand on housing, this is however, already being addressed through an initiative being implemented at a strategic level by the Inverness and Cromarty Firth Green Freeport and The Highland Council.

In conclusion, the Phase 5 Development aims to meet the requirements of the offshore wind sector, to aid in the move towards Net Zero, while ensuring the Scottish economy benefits from floating wind technology deployments, through jobs, business opportunities and economic growth. Adverse environmental impacts associated with construction and all operational scenarios can be mitigated to non-significant levels with the exception of landscape and visual impacts.

Table 19.1: Summary of Significant Effects.

Nature of Impact	Receptor	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Construction							
Ornithology - Nest site destruction or abandonment	All bird species and associated designated sites	Negligible to International		Moderate to Major: Significant	Toolbox Talk on breeding birds prior to start of breeding season. Ongoing checks for breeding birds and nests during breeding season. Nest Exclusion Zones.	Negligible	Minor: Non-significant
Ornithology - Accidental spread of Highly Pathogenic Avian Influenza	All bird species and associated designated sites	Negligible to International	Medium Temporary	Minor: Non-significant to Major: Significant	If required HPAI control measures to be incorporated into the SPP.	Negligible	Negligible to Minor: Non-significant
Marine Mammal - Injury/ Disturbance due to underwater noise from piling operations	All marine mammal species and associated designated sites	International	Low Short-term Reversible	Moderate: Significant	Piling marine mammal Protocol.	Negligible Short-Term Reversible	Non-significant
Marine Mammal - Injury due to interactions with spoil disposal operations	All marine mammal species and associated designated sites	National to International	Low Short-term	Moderate: Significant	Dredged spoil disposal marine mammal protocol.	Negligible	Non-significant
Operations							

Nature of Impact	Receptor	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Ornithology - Habitat Modification – Queens Dock West Berth	Cromarty Firth SPA	International	Medium Permanent	Major: Significant	Provision of alternative tern habitat (tern raft and tern nesting zone). Tern Management Plan implementation.	Negligible	Negligible: Non-significant
	Inner Moray Firth SPA	International	Low Permanent	Moderate: Significant		Negligible	Negligible: Non-significant
	Arctic tern	International	Low Permanent	Moderate: Significant		Negligible	Minor: Non-significant
	Common tern	International	Low Permanent	Moderate: Significant		Negligible	Minor: Non-significant
Landscape and Visual – Visual Effect (principal receptor clusters)	King George Street and Cromlet Drive (within 0.7km) Invergordon	High to Medium	Medium	Moderate to Major: Significant	N/A	Medium	Moderate to Major: Significant
	Recreational areas along the B817 (within 1.7km west of Invergordon)	Medium-high	Medium	Moderate to Major: Significant		Medium	Moderate to Major: Significant
Operations - Floating Offshore Wind Scenario							
Socio-economic and Human Health - Economic Impacts	Inner Moray Firth	Medium	Minor - Moderate	Positive; Moderate: Significant	No specific mitigation required.	Minor - Moderate	Positive; Moderate: Significant
Socio-economic and Human Health - Housing Demand	Inner Moray Firth	Medium	Moderate	Negative; Moderate: Significant	Housing initiatives are being implemented at a strategic level by the Green Freeport and the Highland Council.	Minor	Minor: Non-significant

Nature of Impact	Receptor	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Socio-economic and Human Health - Cumulative Economic Impact Effects with Offshore Wind Projects	Inner Moray Firth	Medium	Minor - Moderate	Positive; Moderate: Significant	No specific mitigation required.	Minor - Moderate	Positive; Moderate: Significant
Socio-economic and Human Health - Cumulative Economic Impact Effects with Offshore Wind Projects	Highland Council Area	Medium	Minor - Moderate	Positive; Moderate: Significant	No specific mitigation required.	Minor - Moderate	Positive; Moderate: Significant
Operations – Floating Offshore Wind Scenario 1							
Landscape and Visual - Visual Effect (principal receptor clusters)	King George Street and Cromlet Drive (within 0.7km) Invergordon	High to Medium	Medium	Moderate to Major: Significant	N/A	Medium	Moderate to Major: Significant
	Newhall and Balblair / north side of Black Isle (within ~2km)	High to Medium	Medium to Small	Moderate to Major: Significant	N/A	Medium to Small	Moderate to Major: Significant
	Recreational areas along the B817 (within 1.7km west of Invergordon)	Medium to High	Medium	Moderate to Major: Significant		Medium	Moderate to Major: Significant

Nature of Impact	Receptor	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Operations – Floating Offshore Wind Scenario 2							
Landscape and Visual - Landscape Effect	LCT 345: The Farmed and Forested Slopes (north of Cromarty Firth)	Medium	Medium to Large, Short-term, Reversible	Moderate to Major: Significant	N/A	Medium to Large, Short-term, Reversible	Moderate to Major: Significant
Landscape and Visual - Visual Effect (principal receptor clusters)	King George Street and Cromlet Drive (within 0.7km) Invergordon	High to Medium	Very large to Large	Major to Moderate: Significant	N/A	Very large to Large	Major to Moderate: Significant
	Western sections of Invergordon High Street (within ~0.9km)	High to Medium	Large	Major to Moderate: Significant		Large	Major to Moderate: Significant
	Cromlet Park (up to ~1km to the north)	High to Medium	Large	Major to Moderate: Significant		Large	Major to Moderate: Significant
Landscape and Visual - Visual Effect (principal receptor clusters)	Newhall and Balblair / north side of Black Isle (within ~2km)	High to Medium	Very large to Large	Major to Moderate: Significant	N/A	Very large to Large	Major to Moderate: Significant
	Alness and up to 3km to the north	High to Medium	Large to Medium	Moderate to Major: Significant		Large to Medium	Moderate to Major: Significant
	Recreational areas along the B817	Medium to High	Very large to Large	Major to Moderate: Significant		Very large to Large	Major to Moderate: Significant

Nature of Impact	Receptor	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
	(within 1.7km west of Invergordon)						
	B817	Medium	Very large to Large	Moderate to Major: Significant		Very large to Large	Moderate to Major: Significant

Key

Significant Effect

20 References

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21 Glossary

Acronym	Definition
PoCF	Port of Cromarty Firth
UK	United Kingdom