Invergordon Service Base Phase 4 Development
Environmental Impact Assessment Report
Volume 1: Non-Technical Summary

May 2018

Contents

1 Introduction

The Cromarty Firth provides a natural deep-water harbour, and its associated Port facilities play a key role in supporting activities in the North Sea and beyond. The Cromarty Firth Port Authority (CFPA), who trade under the name Port of Cromarty Firth (PoCF), are continuing to develop the Port-owned Invergordon Service Base to increase their capacity to provide services to a range of sectors. They have completed three phases of development to date, providing an additional 5.82 Hectares (Ha) of laydown area and a 154m long heavy lift quay, Berth 5. The proposed Phase 4 Development, located immediately adjacent to the previous development (Phase 3), includes the following components:

- Land reclamation providing an additional 4.5Ha of laydown space;
- 215m of quay wall to create Berth 6, adjacent to Berth 5 providing a 369m long combined quay face; and
- Fendering of Berths 5 and 6.

Under the Marine (Scotland) Act 2010, construction of the Phase 4 Development and the associated capital dredging and disposal at sea require Marine Licences. Hence PoCF are applying for Marine Licences under the Act for the Phase 4 Development. Due to the scale of the development and its potential to have a significant effect on the environment, an Environmental Impact Assessment Report (EIAR) is required to support the Marine Licence application, under the Marine Works (Environmental Impact Assessment (EIA) (Scotland) Regulations 2017 [Scottish Ministers, 2017]. As the project was scoped prior to 16th of May 2017, the Phase 4 Development falls under the transition arrangements documented in Section 40 of the 2017 Regulations [Scottish Ministers, 2017].

This non-technical summary summarises the main findings of the EIAR. This EIAR is made up of 4 Volumes:

- Volume 1: Non-Technical Summary
- Volume 2: Main Assessment
- Volume 3: Appendices
- Volume 4: Drawings

Copies of the full EIAR are available to view in the following locations:

- Invergordon Library, 37 High Street, Invergordon. IV18 0DG

The library is normally open from 9am to 12.30pm and 1.30pm to 5pm Monday to Friday, however on a Friday it stays open till 8pm. Library opening times can be checked at: https://www.highlifehighland.com/libraries/.

Electronic copies can be downloaded from the PoCF website: http://www.pocf.co.uk/home-page-3/doing-business-at-the-port/development-plans/

A pen drive can be obtained from PoCF for an administration fee of £5. Hard copies of the EIAR can also be obtained from PoCF at a cost of £300.

2 Background

2.1 Port of Cromarty Firth

The Cromarty Firth is situated on the east coast of the Scottish Highlands; 14 miles (23km) north of the city of Inverness, and 65 miles (105km) south west of Wick. Invergordon is on the north shore of the Cromarty Firth, 7 miles (11km) west of the Sutors at the mouth of the Firth.

The Invergordon Service Base is owned and operated by PoCF. The Port is a Trust Port, which means that 100% of all profits are reinvested in the development of the Port for the benefit of its stakeholders. This independent statutory body is administered by a board of eight trustees, whose role is to make best use of the assets they manage in order to secure them for future use. The ultimate stakeholder is future generations.

The existing Invergordon Service Base encompasses 5 berths and the Queen's Dock, providing over 600m of berthing. In addition, PoCF own and operate the Saltburn Pier to the east of the Service Base. PoCF has undertaken a series of improvement projects on the Invergordon Service Base in recent years. The first two phases involved the surfacing of 2.88Ha of existing Port land with block paving. Phase 3 was completed in late 2015 and consists of 3.6Ha of laydown and Berth 5; a 13.8m deep, 154m long berth to the west of the Queen's Dock. PoCF undertook these developments in response to actual and predicted market demand, particularly in offshore renewable energy, based on information available in 2012.

2.2 Project Need

To allow PoCF to maintain its position as Scotland's premier deep-water port, and to maximise benefits from the Port for local people, there is a need to diversify PoCF's market sector portfolio. This follows a previous heavy reliance on the oil and gas industry, primarily oil rig Inspection Repair and Maintenance (IRM) work. This requires that the Invergordon Service Base continues to develop into a multi-user facility, by providing improved infrastructure for both the offshore renewables sector and the cruise industry, whilst adapting to the evolving demands of the oil and gas market.

Achieving this goal will result in benefits to both PoCF and the local economy, through an increased demand for labour, accommodation, and logistics services. In addition, as the only Port in the area with the potential to accommodate the largest cruise ships, improving facilities for the cruise industry will benefit the wider Highlands through increased tourism footfall, and hence revenue into the region's economy.

For PoCF to continue to attract other market sectors and develop as a multi-user facility, there is a need for additional berthing and laydown space to allow the Invergordon Service Base to accommodate current and future clients. The Phase 4 Development is key for PoCF to retain existing market share and attract new customers in both the offshore renewables and cruise sectors. The requirements for Phase 4 are the provision of an additional laydown space and berth, and the ability to accommodate the largest cruise ships.

Safeguarding access to ports, and the sustainable growth of ports to maximise the potential of other sectors are also key objectives of the National Marine Plan (NMP) [Scottish Government, 2015].

2.3 Consideration of Alternatives

A key part of the Environmental Impact Assessment (EIA) is to ensure that alternatives have been considered from the design stage onwards.

An optioneering study was undertaken in November 2014 to identify potential options to increase laydown and berthing capacity, and to assess which could be utilised to meet both the short and longer-term needs of PoCF and its customers [Affric Limited, 2014]. This was followed by a feasibility assessment, conducted in 2016 by Affric Limited, which considered the preferred options, based on logistical and ergonomic considerations and their ability to meet the various market sector requirements [Affric Limited, 2016].

A variety of options have been considered through the optioneering and feasibility work. These alternative options have been summarised within Volume 2 of the EIAR. In addition, a search for other suitable areas within PoCF's harbour limits was conducted, but nowhere offered such deep, sheltered water close to shore as the Invergordon area. Thus, the chosen option is the optimal location for the Phase 4 Development.

3 Project Description

3.1 Project Element and Location

The Phase 4 Development proposal constitutes the following elements:

- Laydown: reclamation of an additional 4.5Ha of laydown space to the west of Phase 3. Including the revetments, the footprint will be approximately 6.3Ha. The laydown area will have appropriate surface water drainage, discharging to the Firth via an oil and silt interceptor. The surfacing will be a compacted stone finish to allow for settlement; an impermeable surface may be applied at a later date depending on operational requirements.
- Berth 6: additional 215m of quay wall to the west of Berth 5, to provide one continuous berthing face. The seabed will be dredged to -12m Chart Datum to allow access by cruise ships and other large vessels. This will need to be tapered, with appropriate slopes at the edges for stability, hence the dredge footprint is greater than the berthing area.
- Fendering: fenders will be installed on the existing Berth 5 (southern face of Phase 3) and the proposed new Berth 6.

The laydown construction will be similar to that of the Phase 3 laydown area. A rock armoured crushed stone revetment will be constructed around the perimeter. A geotextile membrane will then be installed to allow the area to be infilled while allowing water to move in and out

of the area. Once the area is reclaimed, appropriate drainage, bollards and services will be installed prior to surfacing.

The quay wall will be piled. The installation of the piles is likely to require a combination of vibro and percussion piling, with supporting horizontal anchors. Dredging will be required to facilitate the land reclamation and to obtain appropriate depths at the berth.

The proposed development is to the west of the existing Invergordon Service Base, adjoining the Phase 3 Development, centred at grid reference NH698 683. The full footprint of the development is below Mean Low-Water Springs (MLWS).

Note no permanent structures are currently proposed on the Phase 4 Development, in order to maximise the flexibility of the area to be utilised by different sectors. Temporary solutions may be employed to support various sectors, as required.

3.2 Construction

The construction will comprise of the following stages:

1. Site Set Up;
2. Revetment Toe Dredge;
3. Revetment Construction;
4. Phase 3 Rock Armour Removal;
5. Quay Wall and Anchor Piling;
6. Tie Rods Installation;
7. Infilling;
8. Berth Dredging; and
9. Surfacing and Furniture Installation.

3.3 Operations

The Phase 4 Development, like the rest of the Invergordon Service Base, will be a multi-use facility. For the purpose of assessment, a number of potential operational scenarios were considered: offshore wind; cruise; and oil and gas. Note that it is not possible for these scenarios to overlap, as they all require the use of the new berth. Additionally, cruise ships do not visit in the winter months; hence the Phase 4 Development could be utilised for oil and gas activities in the winter when there are no cruise ships visiting.

3.3.1 Offshore Renewables Scenario

The Invergordon Service Base is suitably located to act as an interim delivery port to offshore wind developments in the Moray Firth and further afield. Interim delivery ports allow the windfarm supplier to deliver the turbine components (towers, nacelles and blades;) for storage, preservation, and an element of pre-assembly prior to being loaded out for installation in the windfarm. The Phase 4 Development does not provide enough berthing or laydown space on its own. Hence for the offshore wind scenario, Phases 1-4 are required. It is assumed that the existing Berth 5 and adjacent quay would be utilised for the delivery of components. The proposed Berth 6 would be utilised for the load-out of partially assembled wind turbines. The new quayside would be used for load-out, and the area immediately to the north utilised for pre-assembly. The remainder of Phases 3 and 4 would be utilised in conjunction with Phases 1 and 2 for storage.

3.3.2 Cruise Scenario

Coupled with Berth 5, Berth 6 could host any size of cruise vessel. Cruise vessels typically arrive in the morning between 7am and 10am and remain on the berth for the day, to allow their passengers to disembark and visit Invergordon and partake in tours to other Highland tourist destinations. The cruise ships depart in the evening between 5pm and 9pm. Coaches arrive in the morning to take passengers on full and half-day tours. Morning tours return in the middle of the day to drop off and collect passengers for afternoon tours. Evening drop off times are determined by the ships departure times. Some passengers elect to undertake private tours or utilise public transport or taxis to visit the surrounding areas. Passengers and cruise staff also walk into Invergordon to visit the shops and attractions, such as the museum.

The cruise sector already visits the Cromarty Firth; hence cruise ships already have effects on Invergordon and the Highlands. The development of Phase 4 will facilitate the retention and growth of the sector.

3.3.3 Oil and Gas Senario

Berth 6 may be utilised for oil and gas projects, such as oil rig Inspection Repair and Maintenance (IRM). This would likely involve the rig or vessel mooring alongside Berth 6, with support facilities, such as offices and storage on the Phase 4 Development laydown area.

3.4 Maintenance

The reclaimed area will be subject to settlement, especially in the first few years after construction. This is likely to lead to a need for surfacing to be topped up and flattened to maintain a good operating surface.

There will be a requirement for maintenance dredging to be carried out as part of the Port's ongoing dredging plans. This is likely to be on a three to four yearly basis.

The drainage system will be subject to regular checks and maintenance to ensure that the interceptors are functioning effectively.

In the long term, (decades,) there may be requirements to augment/replace rock armour, and repair cope beams, resurface concrete pads etc. Cathodic protection will be maintained to minimise corrosion of the steel piles.

Furnishings such as bollards, fenders and lighting columns will require periodic maintenance.

3.5 Decommissioning

As with all the Port facilities there are no foreseeable decommissioning plans, as the aim will be to ensure that the proposed development is maintained in a usable state. If it were to be decommissioned, the elements could be removed from the seabed in a reverse of the construction process. This is very unlikely, and as such, decommissioning has not been assessed as part of the EIA process.

4 Statutory Context and Planning Policy

There are a number of statutory requirements for the proposed Phase 4 Development, as well as national, regional, and local planning policies that may apply to the determination of the Marine Licence application.

4.1 Legislative Framework

Under the Marine (Scotland) Act 2010 a number of activities listed under Part 4, Section 21 of the Marine (Scotland) Act 2010 require a Marine Licence issued by the Marine Scotland Licensing Operations Team (MS-LOT) [Scottish Ministers, 2010]. All of the Phase 4 Development is below Mean High Water Spring (MHWS) and hence will require a Marine Licence. In addition, there will be a requirement for dredging and dredged spoil disposal, which also requires a Marine Licence.

The construction of harbours and port installations fall under Section 10(e) of Annex II of the Environmental Impact Assessment Directive, and as such fall within the Marine Works (Environmental Impact Assessment) (Scotland) 2017 regulations which came into force on the 16th of May 2017, to transpose Directive 2014/52/EU [Scottish Ministers, 2017]. Part 12 of the 2017 EIA Regulations includes transition arrangements for projects scoped prior to the 16th of May 2017, such that only parts of the newer regulations apply. Hence, the Phase 4 Development falls under the transition arrangements documented in Section 40 of the 2017 Regulations.

The Marine Licensing (Pre-application Consultation (PAC)) (Scotland) Regulations 2013 prescribe the marine licensable activities that are subject to pre-application consultation and, in combination with the Marine (Scotland) Act 2010, set out the nature of the pre-application process [Scottish Government, 2013]. The Phase 4 Development falls within these regulations as it covers an area larger than one hectare.

During construction, there may be a need to abstract seawater for activities such as material dampening, to control dust. During construction and operation there is a potential for surface water and water abstracted from excavations to require discharge to the water environment, hence there may be requirements for authorisations under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as Amended) [Scottish Ministers, 2011].

In addition to the above Regulations, if it is determined that the development of construction activities will likely affect European Protected Species (EPS) listed under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended); which includes whales, dolphins, porpoises and otters; an EPS Licence will be required [UK Government, 1994]. A Habitats Regulations Appraisal (HRA) is also required when a project potentially affects a European Natura site (i.e. a Special Protection Area (SPA) or a Special Area of Conservation (SAC)). As the Phase 4 Development sits adjacent to and near to Natura Sites, an HRA will need to be carried out by the competent authority. Information to support the assessment has been included within the EIAR.

4.2 Policy Context

As the project is below the MHWS and MLWS and within 12 nautical miles (nm) of the Scottish coastline, it falls within the remit of the Marine (Scotland) Act 2010. The 2015 Scottish National Marine Plan (NMP) covering inshore waters is a requirement of the Act. The NMP lays out the Scottish Minister's policies for the sustainable development of Scotland's seas and provides General Planning Principles (GENs), and sector specific objectives and policies, which were considered as part of the EIA process [Scottish Government, 2015].

Although the proposed development does not require planning consent as it is below the MLWS, due to the close proximity to land the planning policy context was still taken into consideration. In Scotland, the frameworks for considering planning applications are:

- The National Planning Framework (NPF);
- Strategic Development Plans (SDPs); and
- Local Development Plans (LDPs).

Finally, the National Renewables Infrastructure Plan – Stage 2 (NRIP2) was considered. The NRIP2 is to assist the development of a globally competitive offshore renewables industry in Scotland through the creation of infrastructure, to support large scale manufacturing, assembly, deployment and operations, and maintenance of offshore renewable energy devices [HIE, 2010]. NRIP2 has identified the cluster of proposed marine developments in the Cromarty and Moray Firths as having excellent potential for private developers to base their manufacturing operations. A strong supply chain in offshore renewables is essential for Scotland to remain involved in related economic activity. The proposed Phase 4 Development will address the need for additional deep-water berthing and laydown area, to accommodate the growing requirements of the renewable energy sector.

5 Methodology

5.1 Assessment Methodology

One of the main purposes of the EIA process is to influence and improve design through iteration. Environmental impacts have been considered throughout the project, from the development option stage through to the initial design stages of the project. Where possible, environmental considerations have been incorporated into the design. The siting and design of the Phase 4 Development has been heavily influenced by aspects identified through the EIA process, including public opinion, possible visual and noise impacts, and the potential for disturbance of the local fauna associated with the development.

An environmental specialist has been involved throughout the design process and, where necessary, appropriate topic experts have been consulted to inform the design. The project design therefore has avoided and minimised impacts wherever possible and, as such, there are embedded 'primary mitigation measures' to avoid or reduce negative effects. These have been incorporated within the assessment of effects.

In addition, it is assumed that standard construction practices, such as those outlined in Guidance for Pollution Prevention documents (tertiary mitigation), have be applied in the assessment process and these are captured within the Schedule of Mitigation.

A methodical and robust assessment of environmental impacts has been used across all chapters of the EIAR, 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 procedures are put in place where possible to reduce the potential impact.

5.2 Mitigation

Mitigation identified through the assessment process has been incorporated into the Schedule of Mitigation. The Schedule of Mitigation is then implemented through the Construction Environmental Management Document (CEMD). The CEMD has been submitted as a supporting document to the Marine Licences. An Environmental Clerk of Works (ECoW) will support the construction works ensuring that the CEMD is appropriately implemented.

5.3 Consultation

Consultation has been a key part of the design development and EIA process. There has been dialogue with the local community through workshops, and exhibitions as part of the PAC process. Full details are provided in the PAC Report.

In addition to the formal EIA scoping process, there have been meetings and communications with Marine Scotland and Statutory Consultees. The aim of which has been to ensure that the EIAR covers all relevant topics and that effects could be designed out wherever practicable.

5.4 Cumulative Impacts

A review of planned onshore and offshore developments was conducted in order to identify potential cumulative impacts, and these projects were scoped in or out on a topic by topic basis. Developments topics scoped in were then assessed within the relevant topic specific chapters in Volume 2.

6 In-Air Acoustics

Environmental, or community noise, is a broad term that encompasses noise emitted from many sources, including road, rail & 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 deterioration in noise as a result of a proposed development.

The noise assessment carried out for the EIAR considered the likely significant noise effects associated with the construction and operational scenarios of the Phase 4 Development on nearby residential receptors. Specifically, the assessment:

- Identified potential noise sensitive receptors in the vicinity of the Phase 4 Development and quantified the existing baseline noise levels at seven identified locations;
- Calculated the likely levels of both construction noise and operational noise at the nearest receptors to determine the potential for significant noise effects associated with the proposed development; and
- Indicated any requirements for mitigation measures in order to provide sufficient levels of protection for nearby receptors.

The noise modelling assumed that all plant is operating concurrently in full operational mode within the closest areas to each receptor, in order to provide a worst-case scenario. In reality only, a proportion of the plant may be operating for a proportion of time. The hours of operation of machinery during construction are assumed as 07:00 to 19:00 seven days a week for all construction stages, except for dredging which would occur for a concentrated period that may require 24-hour working.

The construction noise levels at all assessed receptors during all construction stages are below the daytime, weekend, evening and night-time thresholds adopted for this project. Furthermore, the noise model predicts a worst-case scenario with all construction plant operating concurrently, and in reality, noise levels are expected to be lower than predicted.

The assessment of operational noise levels has been undertaken for the offshore renewables, cruise, and oil and gas scenarios. Noise impacts were expected to have no change, or be of negligible change, leading to no significant effects of noise associated with operations of the Phase 4 Development.

Though there are no significant effects identified, careful consideration will still be given to the type of plant to be used for each stage, to minimise noise during construction. No mitigation measures are required to lessen the operational noise impacts; however, best practice measures will be employed to ensure noise levels are kept to a minimum.

7 Underwater Piling Noise

During the proposed Phase 4 Development works at the Invergordon Service Base, both vibro and impact piling will be required for the installation of cylindrical and sheet piles, and this will result in elevated levels of underwater noise. Marine piling operations is the activity which will result in the greatest underwater noise levels, and hence was the focus of the underwater noise assessment. Piling noise has the potential to disturb and possibly injure marine organisms, particularly marine mammals and fish. Other sources of underwater noise were considered in more detail in the marine mammal impact assessment.

Vibro piling will be used in preference to impact piling, due its reduced underwater noise emissions, with piles being driven to refusal using a vibro hammer, before being driven to design depth with an impact hammer if required. Impact piling was considered in the assessment as the worst-case scenario.

No data is available for marine baseline noise levels within the Cromarty Firth, and no baseline noise monitoring was conducted. The current source of underwater noise would be limited to vessel traffic, with vessels and rigs alongside in Port or moored in the Cromarty Firth. Some noise will also result from ongoing activity in the Port. As an area with significant marine industry, baseline underwater noise levels in the Cromarty Firth would be expected to be significantly higher than for a less developed estuarine location, and highly dependent on the ongoing activities at the various marine facilities in the Firth.

The proposed impact piling operations at Port of Cromarty Firth include piling of 2m diameter cylindrical piles and sheet piles. The underwater noise model assumed a hammer energy of 500kJ for cylindrical piles and 120kJ for the sheet piles. The size of the pile was used to determine the frequency content of the noise. The model assumed that the noise source acts as a single point, the water depth at the noise source (accounting for tide) has been used to adjust the source level to allow for the length of the pile in contact with the water.

The impact ranges for these two different pile sizes vary significantly between fish and marine mammals depending on the functional hearing (species) group and the applicable criteria taken from appropriate literature. Impact assessments for these receptors were carried out as part of the diadromous fish and marine mammal assessments

The bathymetry and geography of the Cromarty Firth is such that most of the underwater noise energy generated by piling operations will be contained within the Cromarty Firth itself. As such, no cumulative effects with other projects were predicted.

8 Air Quality

The focus of the air quality assessment was on the fugitive dust emissions associated with the construction of the Phase 4 Development and the carbon emissions associated with the project.

Sensitive receptors identified for the dust assessment were: Cromarty Firth SPA, Linear Park and Service Base workers. Sources of dust associated with the Phase 4 Development are:

- Construction works, including the storage and use of revetment and infill materials;
- Track out associated with the Heavy Goods Vehicles (HGVs) delivering primarily materials to the site;

Dust impacts due to construction and track out for Service Base workers were assessed as having a moderate, significant effect in the absence of mitigation. The track out on Linear Park is also assessed as being moderate and significant without mitigation. All other assessments related to dust were non-significant. Appropriate mitigation has been identified for the management of dust, taking into account the Institute of Air Quality Management and Pollution Prevention Guidelines. A Dust Management Plan has been developed and included within the CEMD. Mitigation reduces the previously assessed significant effects to non-significant levels.

The carbon cost with regards to materials usage and delivery was calculated. A total of 15,760t of carbon dioxide equivalent (CO_2e) is estimated to be produced as a result of the construction of the Phase 4 Development, equivalent to the annual carbon footprint of 2,584 people or 0.03% of the annual CO_2e for the whole of Scotland in 2015. However, it should be borne in mind that the development will last decades and, as such, the greenhouse gas cost should be spread over the development's lifespan, which is likely to be in excess of 50 years. Therefore, the greenhouse gas emissions were deemed to be low and non-significant.

Mitigation to reduce greenhouse gas emissions associated with construction include the optimisation of material usage through the design process, and local sourcing of materials where practicable; helping to avoid unnecessary CO_2e.

Activities associated with Phase 4 maintenance and operations will primarily be associated with dredging every three to four years. Operational electricity usage directly attributed to the Phase 4 Development will be limited to lighting. The operational carbon footprint associated with maintenance and operations was assessed to be negligible and non-significant.

The offshore renewables scenario and the role that Phase 4 may play in realising the potential of the offshore wind sector was acknowledged as a beneficial effect in terms of greenhouse gas emissions. For the cruise ship scenario, as larger cruise ships use less fuel per person than their smaller counterparts, the Phase 4 Development will help the cruise sector to reduce their carbon footprint, which is a beneficial effect of the Port. The support the Phase 4 Development can offer to the oil and gas IRM sector does not differ to the existing offering, as such it is unlikely to change the greenhouse gas emissions associated with the operations of this sector.

9 Coastal Processes, Ground Conditions and Contamination

A current and sediment model was produced to provide an understanding of the present and predicted hydrological and sediment movements in the Phase 4 Development area. Key coastal processes that could be impacted by the proposal include: wave regime; current regime; sediment transport; erosion and deposition; and flood risk.

Ground Investigations (GI) were undertaken in early 2017 to understand the seabed conditions in terms of geology and potential contamination issues. The GI indicated that cohesive marine beach deposits comprising very loose to medium dense slightly gravelly very silty sand, and very soft to firm grey slightly clayey sandy silt underlays the proposed development area. Glacial deposits underlay the marine beach deposits, these are made up of granular and cohesive glacial till. Chemical analysis carried out on thirty different samples from the site revealed no contamination issues associated with sediments in the area.

The Cromarty Firth is an extensive elongated water body, 30km long and typically between 1km and 2km wide. The water circulation within the body of the Cromarty Firth, and in particular within the vicinity of the Service Base extension area, is not particularly strong, with peak ebb speeds of 1 to 1.1m/s in the centre of the channel between the Service Base and Balblair.

As a result of the Phase 4 Development, the current speeds will reduce by up to 0.43m/s to the immediate south of the proposed development. The area to the north is mainly inter-tidal, and the regime will only be impacted at high and on ebbing tides, when speeds may be reduced by up to 0.15m/s. To the west of the development speeds will increase by up to 0.08m/s on the ebb tide. The current changes are very localised.

The mud transfer model predicted no erosion or sedimentation in the intertidal area, nor will there be any coastal squeeze. There is a very slight scour effect predicted for the northwest corner of the development (5-10cm per annum). There is also an area of slight deposition further to the northwest of the development (5-10cm). In the Berth 6 dredge pocket deposition is predicted to be 0.5m/year. The construction of the Phase 4 Development will increase deposition at Berth 5 by 0.1m/year, while the deposition in the Queen's Dock may reduce by 0.17m/year. The overall effect on the existing maintenance dredge regime for the existing Service Base is deemed to be minor and non-significant.

The dredge disposal ground has been utilised for many years and has plenty of remaining capacity. It will therefore will be unaffected by more material being disposed there from the Phase 4 Development and the associated maintenance dredge regime.

The proposed Phase 4 Development design level is 5.9m which is above both the 1 in 200 and 1 in 1000 year flood levels of 5.51m and 5.67m respectively. There is negligible risk of flooding of the Phase 4 area. The Phase 4 Developments' potential to affect flood risk elsewhere was also considered. No significant effects were identified.

10 Ornithology

There are several designated sites relevant to the proposed Phase 4 Development which have been designated specifically for ornithological interests. The development sits directly adjacent to the Cromarty Firth SPA, Ramsar and Site of Special Scientific Interest (SSSI), which is 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 SPA, Ramsar, SSSI and other nearby designated sites; a combination of field surveys and a comprehensive desktop study was carried out. Breeding bird surveys confirmed the presence of the following breeding birds near the development area: arctic and common terns, eider ducks, common gull, and goosander. The terns and eiders favour nesting by Berth 4. Eiders also utilise the end of the Queen's Dock on the rock armour. A common gull nest was also found within the rock armour area of the Queen's Dock, and the goosander was recorded with young, close to the Invergordon Boat Club, more than 1.5km away from the proposed development.

Winter bird surveys carried out over two winters recorded a total of 21 species of waterfowl, wader or seabirds using the shoreline or adjacent waters, with an additional 9 terrestrial species recorded during the surveys. It was noted that the shoreline itself was quite a disturbed habitat, with dog walkers regularly flushing the birds from the shore, particularly in the sections within 500m of the proposed development. The species recorded most regularly on the winter surveys were: oystercatchers, curlews, redshank, herring gulls and common gulls. The most numerous species were herring gulls, common gulls, and oystercatchers. The waders were not evenly distributed across the shoreline, with the greatest numbers, in general, being found beyond 500m of the proposed development.

During construction, the birds have the potential to be impacted by: habitat disturbance due to additional construction vessel movements, disturbance due to increased noise and light pollution, water quality changes during dredging activities, and by a permanent change of habitat when the new berth is constructed. None of the above disturbances were predicted to have more than minor, non-significant impacts on the bird species assessed. Only one impact was identified as being moderately significant in the absence of any mitigation: the accidental destruction of nests during the rock revetment removal construction stage, which is particularly relevant to nesting eider ducks. Mitigation measures for birds include ensuring the ECoW enforces a breeding bird protection plan, which will ensure pre-construction surveys are carried out prior to rock armour removal, resulting in the moderately significant impact due to accidental nest destruction being reduced to negligible, non-significant.

During the operational phase, effects on increased vessel movements or water quality effects during maintenance dredging are not predicted to have any significant impacts on the birds utilising the waters close to the Invergordon Service Base, the surrounding coastline and waters, or at the dredge disposal site.

11 Marine Mammals

The Phase 4 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 4 Development include the Moray Firth SAC, and the Dornoch Firth and Morrich More SAC, designated for bottlenose dolphins and common seals respectively.

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 4 Development. The study included a review of the 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 common seals, bottlenose dolphins and harbour porpoises. Bottlenose dolphins are identified as being regular visitors to the area, although the Sutors region, 9km to the east at the entrance to the Cromarty Firth, is considered to be more valuable habitat to dolphins than the development area. Minke whales and grey seals are resident in the wider Moray Firth, but only very infrequently enter the Cromarty Firth, and as such are very unlikely to be affected by the proposed development. Reference was also made to the underwater piling noise model to predict the potential impacts on marine mammals resulting from underwater noise.

During construction there is the potential for the marine mammal species identified above to be impacted through disturbance due to increased vessel traffic, foraging impairment due to increased water column sediment loading during dredging operations, and injury and displacement due to potential spills of hazardous substances. When the water quality and spill prevention mitigation identified in topic-specific chapters are considered, the above impacts are assessed as minor and non-significant. 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: 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 resulting from underwater piling noise and dredged spoil disposals, marine mammal monitoring and passive acoustic monitoring protocols will be employed to ensure marine mammals are not in the zone where injury is likely to occur, prior to the operation commencing. The marine mammal mitigation protocols are detailed in the CEMD, and an ECoW will be onsite to ensure that the marine mammal mitigation is effectively implemented. The ECoW will also ensure compliance with mitigation to minimise sediment loading and prevent spills of harmful substances. After the implementation of the above mitigation, the residual impacts on marine mammals associated with construction are assessed as minor, non-significant.

During the operational phase, the potential marine mammal impacts associated with increased vessel traffic, water quality, noise, and habitat loss were assessed as minor, non-significant. No significant cumulative effects were identified.

12 Otters

Otters are a Schedule 5 species of the 1981 Wildlife and Countryside Act and are a European Protected Species protected under regulation 45 of the Conservation (Natural Habitats and Species) Regulations 1994 (as amended) in Scotland.

The nearest site designated for otters is the Dornoch Firth and Morrich More SAC. In the coastal environment otter home ranges are between 2-10km. As the distance to the SAC is 45km by sea, it is very unlikely an otter would travel from the Dornoch Firth SAC to the proposed development. Therefore, no designated sites for otters were considered within the assessment on otters.

Four otter surveys were carried out to inform the otter assessment. The surveys identified numerous areas which showed evidence of both sprainting and feeding. There was also photographic evidence captured on camera traps, and construction worker sightings during the Phase 3 construction works. Evidence suggests that otters frequently visit the rock revetment surrounding the Phase 3 Development. It is highly likely that a coastal otter is using an area to the west of the Invergordon Service Base as a lay-up and feeding area, with the potential lay-up located within the cavities of the rock armour.

Construction activities will give rise to disturbance associated with: local vessel movements due to dredging and piling works; rock armour removal and placement; piling and infilling; and surfacing activities. Increase in human activity and noise levels may lead to otters avoiding the area, however there is some evidence that otters in the area are slightly habituated to the activities of the Service Base. In the unlikely event of an accidental release of hazardous substances during construction, this would lead to a significant effect on otters. However, with pollution prevention as key mitigation, this results in a non-significant, minor impact.

Prior to any works that may disturb or destroy the rock revetment, pre-construction surveys will be carried out. This will mitigate against a potentially significant impact, if there were to be damage to a holt or lay-up site during construction. However, if a lay-up is confirmed, an EPS licence will need to be sought from Scottish Natural Heritage (SNH) to agree specific mitigation to allow works to be undertaken. To comply with the legislation protecting otters, and to minimise the potential impacts on otters, a Species Protection Plan (SPP) is included in the CEMD. The ECoW will oversee construction and ensure that good practice measures with regards to the protection of otters are implemented.

An increased surface area of rock armour as a result of the completed Phase 4 Development means there is an increase in potential resting or feeding habitat, which is considered to have an overall beneficial effect for the local otter population.

13 Diadromous Fish

An extensive literature review identified three diadromous fish species: Atlantic salmon, sea trout, and European eel, as inhabiting the river systems in the Cromarty Firth. Their migratory movements to the spawning grounds occur through the Sutors, the only entry into the Cromarty Firth from the open sea. No designated sites for fish were considered as part of the assessment due to the lack of ecological connectivity to the designated sites and the proposed development area.

The literature review identified migrating times and swimming preferences within the Cromarty Firth. Atlantic salmon post-smolt runs are expected close to the shoreline through the Cromarty Firth from the river systems into the Moray Firth, occurring from late April to June, peaking in May. Returning Atlantic salmon runs in the Cromarty Firth were identified to occur between November to December, also running close to shore.

Sea trout post-smolts move from rivers to sea lochs/estuaries between April and early June, prior to moving to the open sea in late June to July, returning in August to September. Immature sea trout, nationally referred to as finnock, return to freshwater after only one year at sea to over-winter, returning in spring months. Sexually mature sea trout migrate through the Sutors to the Cromarty Firth river catchments generally from April to June. In the Cromarty Firth the post-smolts, finnock and mature adult sea trout are known to swim very close to the shoreline.

Knowledge of European eel movements and migratory timings is limited. Adult eel migrations are reported from August to October, though migratory timings vary nationally. Juveniles arrival around Caithness occur around November, but juveniles may arrive early in August. No information regarding eel swimming preferences were identified.

The potential effects on diadromous fish due to the Phase 4 Development was identified as being through increased sediment loading from dredging and dredge disposal, underwater noise from construction, and accidental release of hazardous substances. The increased sediment loading from the dredging and dredge disposal activities was identified as resulting in a moderate significant impact upon Atlantic salmon by potentially impairing outward smolt migration. All other disturbances are predicted to result in minor, non-significant impacts.

Mitigation measures for diadromous fish include the appointment and enforcement of an ECoW, with the power to stop works if required. To mitigate the identified significant effect upon Atlantic salmon smolts outward migration, dredging and spoil disposal operations will be prohibited during the month of May, resulting in no significant effects for diadromous fish as a result of the proposed development. No cumulative effects on diadromous fish are expected.

14 Benthic Ecology

In order to appropriately assess the potential effects on benthic ecology from the Phase 4 Development, the baseline condition had to understood. This was achieved through an extensive literature review, computer modelling of the hydrodynamic and sediment regime and field surveys. The surveying consisted of intertidal and benthic surveys. The benthic survey identified two biotopes in the proposed infilling area: Infralittoral mixed sediment and infralittoral muddy sand. The intertidal survey identified multiple species and biotopes, none of which were of conservation concern.

The literature review identified several sites specifically designated for benthic features near the proposed Phase 4 Development. Directly adjacent to the proposed development site lies the Cromarty Firth SSSI and Ramsar site, designated for its marine mudflats and sandflats. Additionally, subtidal sandbanks are a designated feature of the Moray Firth SAC, which lies approximately 5km east of proposed Phase 4 Development. Further sites designated for benthic features near the proposed development were identified, but not considered due to no likely connectivity.

The construction stage of the Phase 4 Development may impact the benthic ecology of the site through; habitat loss, physical disturbance through dredging and dredge spoil disposal operations, increased sediment loading in the water column, accidental spillage of hazardous substances, and introduction of non-native marine species. The infilling will result in total habitat loss of the infralittoral biotopes within the localised construction area. However, the physical and biological features associated to the biotopes are common, and the area lost is relatively small compared to the wider Firth. During operation of the Phase 4 Development, periodic maintenance dredging will have localised impacts.

The embedded mitigation provided by the project design ensured a location with the least potential for impact on benthic ecology receptors was selected for the development site. Nevertheless, several potential impacts on the benthic receptors were identified, as a result of the construction and operation of the Phase 4 Development. However, none of the impacts were assessed to be significant. This was due to the localised and transient nature of the impacts, the quality and value of the receptors, together with the implementation of existing mitigation identified to preserve water quality during the construction and operation of the development.

No cumulative effects with any other projects are predicted due to the distances involved.

15 Landscape and Visual

The effects of the proposed Phase 4 Development on the landscape and visual resources of the site and the surrounding area during construction and operation were assessed. Visual effects result from the changes in the content or character of views and visual amenity, due to changes in the landscape. The assessment of visual effects takes account of both the sensitivity of the visual receptors (individuals or groups of people) and the magnitude of the change on their views and visual amenity.

Construction operations were found to have significant effects on the following receptors:

- Enclosed Farmed Landscapes (localised);
- Enclosed Firth (localised);
- Dwellings in Invergordon (within 0.6km);
- Dwellings in Balblair (northern edge of settlement and dwellings at Newhall Point);
- B817 (within 1.7km west of Invergordon); and
- B9163 (0.4km section east of Balblair).

Four different operational scenarios were considered:

1. Phase 4 structures with no temporary elements present;
2. Phase 4 structures with cruise ships berthed alongside;
3. Phase 4 structures with oil rigs alongside; and
4. Phase 4 structures with offshore renewables components.

Photomontages predicting the view from various points under different operational scenarios can be found in Volume 4 of the EIAR. Temporary significant effects are predicted to arise during the following operational scenarios:

- Scenario 2: Cruise ship
    - Dwellings in Invergordon (within 0.6km); and
    - B817 (within 1.7km west of Invergordon).
- Scenario 4: Offshore Renewables
    - Enclosed farmed Landscapes (localised);
    - Enclosed Firth (localised);
    - Dwellings in Invergordon (within 0.6km);
    - Dwellings in Balblair (northern edge of settlement and dwellings at Newhall Point);
    - B817 (within 1.7km west of Invergordon); and
    - B9163 (0.4km section east of Balblair).

As part of an iterative process of design there are a number of embedded mitigation procedures that have been put in place to minimise the likely landscape and visual effects. They included designing the proposed development to reflect the shape and materials of Phase 3, particularly the colour and texture of the rock armour; reducing the effects of lighting by minimising the number of active luminaires; and locating the new facility to reduce the visibility of the permanent elements from the centre of Invergordon. Good practice measures will also be put in place to reduce effects where possible.

16 Local Community and Economics

Invergordon and the wider Cromarty Firth area are home to a range of commercial, industrial, and leisure-based activities. Invergordon and the Service Base lie within the Cromarty Firth Ward of Highland Region and within the Inner Moray Firth area of Highlands and Islands Enterprise (HIE). Population growth in the Inner Moray Firth area between 2001 and 2011 was almost double that for the Highlands and Islands (14.8% and 7.5% growth respectively) and over three times the Scottish growth rate (4.6% growth). Broadly, the Cromarty Firth has a marginally larger young population (less than 16 years old) but a smaller working age population (16-64 years) compared to both Highland Region and Scotland as a whole.

The Highlands tends to have a greater share of employees in agriculture & fishing, energy, and distribution, hotels & restaurants, and a smaller share in manufacturing. However, comparing the Cromarty Firth area to the Highlands as a whole, reveals that over a quarter (25.3%) of employees in employment in the Cromarty Firth are employed in manufacturing, compared to under 7% for the Highlands Region.

Invergordon is afforded a range of recreational facilities, including a sailing club to the west of the proposed Phase 4 Development, and Linear Park which is a popular dog walking route. The need for good communications with local residents and recreational users of Linear Park and the sailing club are recognised as key to minimising the effects of the project on recreation. Encouraging local content through the procurement will help to maximise the local and Scottish benefits of the construction works.

Invergordon plays a key role in the tourism sector primarily due to the cruise sector. The additional cruise ship business as a result of the Phase 4 Development is predicted to support 165 direct, indirect and induced full-time employees locally, 180 employees within the Highlands and Islands and 197 employees in Scotland as a whole. The onshore expenditure would generate total wages and salaries of around £1.65 million locally, £1.80 million within the Highlands and Islands and £1.97 million within Scotland. It is likely that the current level of economic benefit would be depleted over time without the Phase 4 Development, as PoCF could not accommodate the new larger cruise vessels.

For the offshore renewables support, it is estimated that the installation phase activities at the Phase 4 Development could create approximately 27.7 permanent full-time jobs directly locally, with associated wages and salaries of £11.36 million and Gross Value Added (GVA) of £23.27 million. The installation phase activities at the Phase 4 Development could support 43 full-time jobs locally, with associated wages and salaries of £15.95 million and GVA of £34.60 million.

The economic assessment revealed that there would be an overall positive benefit to the local community as a result of the Phase 4 Development and for the region as a whole.

17 Material and Waste

The construction of the Phase 4 Development will utilise a large amount of raw materials, however there are opportunities to minimise these. Materials have been identified through the design process to meet the functional requirements of the development, and material usage will continue to be optimised through the detailed design stages. Local sourcing of materials will reduce the associated carbon footprint of the materials utilised to construct Phase 4. Where practicable a high recycled content will be sought whilst still meeting appropriate engineering standards.

Rock, stone and infill material will be delivered on a 'just in time' basis as far as practicable. The fuel bowser will be under strict management controls to prevent pollution incidents, keeping it secure to protect it from sabotage and oil thefts, and to comply with the requirements of the Oils Storage Regulations. Where practicable, bio-degradable hydraulic fluids will be utilised in machinery during construction.

Dredge arisings will be reused as infill material, if the material is suitable and it is practicable to do so. Unsuitable material will be disposed of at the Sutors spoil disposal ground. Appropriate materials storage arrangements will be put in place in line with relevant legislation and best practice. The waste hierarchy and good waste management practices will be employed to manage waste arisings. Appropriately bunded oil and chemical storage cabinets will be provided on site. These will be kept locked, with the key under management control to ensure appropriate use and accountability. Spill kits and procedures will be in place.

An appropriate Site Waste Management System (SWMS) will be put in place by the construction contractor. It will ensure that appropriate records are kept for all waste arisings and that waste transfer notes will be retained. The SWMS will be based around the waste hierarchy and every effort will be made to minimise waste arisings, and to reuse materials on site. Where this is not practicable, the next step down the waste hierarchy is recycling. Recycling will be facilitated by the segregation of wastes in clearly marked receptacles in designated areas. The ECoW will carry out regular audits of the SWMS and review details of waste arisings to identify areas for opportunity to reduce or recycle more wastes.

Litter on the Phase 4 construction site, or any of the vessels associated with the works, has the potential to give rise to marine litter. All personnel working on the project will need to undertake a site induction, which will include a section on waste management and the use of the waste receptacles provided. It will be made clear that littering will not be tolerated. The use of single use plastics will be discouraged, reusable water bottles supplied to all personnel and reusable crockery and cutlery will be provided in the welfare facilities.

Cumulative effects with other projects were considered and may result in a beneficial outcome. Both Aberdeen Harbour and Port of Ardersier Ltd may be carrying out dredging during the Phase 4 construction period and both projects will give rise to large volumes of dredge material requiring disposal. If the material is suitable for reuse and the timings align, then there is a potential to reuse the dredge arisings as infill material for the Phase 4 Development. This would reduce the waste disposal volumes from dredging works associated with the other project while minimising the use of quarried finite material to infill Phase 4.

18 Traffic and Transport

Impacts on traffic and transport were identified and quantified, and mitigation procedures were laid out to control or reduce the potential impact. This process has primarily been completed as part of the Transport Assessment (TA) and the associated Framework Construction Traffic Management Plan (FCTMP) and Framework Travel Plan (FTP) which are supporting documents to the Marine Licence application.

The Phase 4 Development is dependent on the capability of the local transport network to accommodate the traffic associated with the offshore renewables, oil & gas, and cruise ship operational scenarios. There is also the potential to generate impacts on this network from non-motorised movements associated with the cruise ships.

Where possible, construction materials will be delivered by sea and offloaded directly onto the site. There will be occasions where some deliveries are made by road, all of which will approach the site entrance from the west along the B817 Shore Road. The HGV activity associated with the revetment construction is considered to represent the most onerous period of HGV activity on the local road network, with 194,000 tonnes of rock to be transported to the site. This is forecast to generate approximately 540 two-way goods vehicles movements per week over a 36-week period. These roads are of an appropriate standard to accommodate the heavy goods vehicle movements proposed. It is anticipated that these extra movements will have a minor increase in severance along the B817 road, although this will be on a temporary basis, and that the level of change is less than a 10% increase. No significant impacts were identified as a result of the increase in HGV and staff personnel traffic as part of the Phase 4 Development.

The operational scenarios were considered as part of the traffic assessment. For the offshore renewables and oil & gas scenarios, a negligible change in HGV/abnormal load movements was predicted. For the cruise ship scenario, typical operation is likely to generate a negligible number of additional daily local highway network trips during cruise ship days. For larger cruise ships there is likely to be a noticeable increase in bus, pedestrian and cycle movement over typical cruise ship operation on the local highway network. This will be infrequent, potentially less than 10 days per year. As such, this is classified as being non-significant in effect.

Mitigation procedures will be put in place to minimise potential impacts on traffic. HGV wheels will be checked prior to leaving the quarry and prior to leaving the Invergordon Service Base, to reduce the risk of gravel and rocks being thrown from HGV tyres. The HGV movements are anticipated to occur outside of weekday peak hours and arrangements will be made with suppliers and vendors for construction vehicles to limit or minimise peak morning and evening travel hours in the locality. The FCTMP outlines the key principles on how the works will be managed.

Sustainable transport access to the Invergordon Service Base for typical daily operations will be promoted through the implementation of the FTP. During cruise operations at the Invergordon Service Base, mitigation measures are those set out in the Transport Assessment which aim to ensure that the effect from the typical operation are managed and consequently minimised. Measures to offset potential traffic impacts associated with cruise passenger travel arrangements to/ from the Invergordon Service Base are also laid out.

19 Navigation

The potential change in vessel numbers associated with the construction and operation of the Phase 4 Development was considered for this assessment, as well as the potential for navigational risks associated with the proposed development.

Navigational risks associated with construction works are low and will be managed by existing protocols. PoCF will liaise with the Northern Lighthouse Board to agree the navigational lighting requirements of the new berth which is likely to include moving the existing green lights on the west of Phase 3 onto the western corner of Phase 4. Further mitigation measures to be employed during construction will include: marine safety information including local Notices to Mariners, radio navigation warnings (as deemed appropriate during the marine works); information provided to the UK Hydrographic Office to update nautical charts; and compulsory pilotage of vessels over 60m within the Firth to reduce the risk of navigation incidents for vessels transiting the construction area of Berth 6.

There will be an increase in vessel movements occurring to the west of the Invergordon Service Base, where there were minimal movements before. During operations the use of Berth 6 will be controlled as per PoCF's existing procedures which requires all vessels to comply with the International Regulations for Preventing Collisions at Sea (as amended) (International Maritime Organization,1972); and for the dredged berth pocket to be surveyed at least once every four years and dredged as required to maintain safe operational draft depths. In addition, the use of Anchorage No. 4 will need to be carefully managed to prevent potential collision issues associated with the swing area required by larger vessels to berth alongside Berths 5 and 6.

Predicted additional vessel movements were calculated. Construction is likely to require in the region of 150 vessel movements. The offshore renewable operational scenario gives rise to up to 200 vessel movements a year. Assuming that Berth 6 will be utilised for cruise in the summer and oil and gas assets in the winter, the total worst-case associated annual moves with these scenarios would be 128 additional vessel movements.

20 Water Quality

The Phase 4 Development is situated on the eastern end of the Inner Cromarty Firth, within a kilometre of the western boundary of the Outer Cromarty Firth, as defined in the River Basement Management Plan. The Inner and Outer Cromarty Firth are classified with an overall status of Good, an overall ecological status of Good and a chemical status of Pass. The Cromarty Firth can be described as relatively pristine with regard to the presence of Marine Non-Native Species (MNNS). No MNNS were recorded during the benthic survey, and only one species of MNNS has been recorded in the area; the Darwin's or Acorn barnacle.

The Cromarty Bay on the south side of the Cromarty Firth; 1.5km southwest of the proposed Phase 4 Development, is classed as a Shellfish Water (Identifier UKS7992317, Water Classification ID PASWPA11). Its 2014 status was Fair [SEPA, 2016].

Dredging (revetment toe dredge and berth dredge), dredging disposal and the placement of in-fill material all have the potential to increase sediments in the water column. Such increased sediments can cause increased turbidity and can have negative effects on ecological receptors. The only activity with the potential to cause significant impacts due to increased sediments in the water column without mitigation is the infilling work, which could result in a moderate significant impact. However appropriate isolation of the infill area with a weir arrangement, to allow appropriate residence time to allow sediments to drop out of the water column, under continual review by the ECoW, will reduce the likelihood giving rise to a minor, non-significant effect.

It was recognised that materials including oils, fuels, cement washings and hydraulic fluids utilised during construction and operations would cause pollution if released into the water environment, with knock on effects on ecological receptors. Appropriate pollution prevention planning, including good material storage and use, spill procedures, availability of spill kits and trained personnel all reduce the risks associated with water pollution. Specific procedures will be in place for construction works. The Phase 4 Development area will be drained via an oil and silt interceptor which will include the capability to stop outflows in the event of any issues. PoCF's existing pollution prevention response procedures will apply during the operational phase.

The risk of introducing MNNS during construction and operations was deemed very unlikely, giving rise to a minor non significant effect. However, the need to follow best practice with regard to ballast water management and the cleaning of plant and equipment prior to mobilisation to site was recognised.

Any new discharges to the water environment will require authorisations under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as Amended) [Scottish Government, 2011] by the Scottish Environment Protection Agency (SEPA).

A Water Framework Directive (WFD) assessment was also completed and found that there is no predicted reduction in the WFD statuses of the Inner and Outer Cromarty Firth transitional water quality associated with the Phase 4 Development.

21 Conclusion

The Phase 4 Development at the Invergordon Service Base will provide additional berthing (Berth 6) and laydown area, co-located with the existing Phase 3 laydown and Berth 5. The combined lengths of Berths 5 and 6 will be 369m and the combined laydown area will be 9.5Ha. The development, like the rest of the Invergordon Service Base, will be a multi-user facility. It has been specifically designed to take into account the needs of the marine renewables and cruise ship sectors but may also be utilised to support oil and gas activities. The EIAR has considered environmental effects associated with construction and three operational scenarios.

A systematic assessment of a wide range of environmental topics has been completed and, where necessary, mitigation has been identified to minimise the environmental effects arising. Provided appropriate mitigation measures are implemented, the proposed Phase 4 Development will not have any long term permanent significant effect on the environment. Significant landscape and visual effects on local receptors will occur during construction and under specific operating conditions. The construction and operation of the proposed Phase 4 Development would bring substantial benefits to both the local and regional economy. If the development were not to go ahead, the opportunity to maximise the local content of the offshore renewables sector may be lost and the economic benefits currently afforded by the cruise ship sector to the Highlands and Scotland would be depleted over time.

22 Glossary

Acronym	Definition
AA	Appropriate Assessment
CEMD	Construction Environmental Management Document
CFPA	Cromarty Firth Port Authority
cm	Centimetre
CO_2e	Carbon Dioxide Equivalent
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPS	European Protected Species
FCTMP	Framework Construction Traffic Management Plan
FTP	Framework Travel Plan
GEN	General Planning Principles
GI	Ground Investigation
Ha	Hectare
HGV	Heavy Good Vehicle
HES	Historic Environment Scotland
HIE	Highlands and Islands Enterprise
HRA	Habitats Regulations Appraisal
IRM	Inspection Repair and Maintenance
km	Kilometres
kJ	Kilojoule
m	Metres
m/s	Metres per second
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
MPA	Marine Protected Area
nm	Nautical Miles
NMP	National Marine Plan
NRIP2	National Renewables Infrastructure Plan2
PoCF	Port of Cromarty Firth
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Species Protection Plan
SSSI	Site of Special Scientific Interest
SWMS	Site Waste Management System
TA	Transport Assessment
WCA	Wildlife and Countryside Act

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