

Kincardine Offshore Windfarm

Non-Technical Summary

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ATKINS

Plan Design Enable

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1. Introduction

1. This document is the Non-Technical Summary (NTS) of the Environmental Statement (ES) for the proposed Kincardine Floating Offshore Windfarm (the 'Project'). The purpose of this document is to provide an overview of the key findings of the Environmental Impact Assessment (EIA) undertaken by Atkins Limited (Atkins) on behalf of Kincardine Offshore Windfarm Limited (KOWL).
2. In this NTS, reference is made to the following areas:
 - The Development Area – the windfarm area including the Wind Turbine Generators (WTG) and inter-array cables.
 - The Offshore Export Cable Corridor – the area within which the proposed export cables will be laid, from the perimeter of the Development Area to the onshore area at Mean High Water Spring (MHWS).
 - The Onshore Area – the onshore area above Mean High Water Spring (MHWS) including the underground cables connecting to the onshore substation at Redmoss.

1.1. Kincardine Offshore Windfarm Limited

3. Kincardine Offshore Windfarm Limited (KOWL) is a new company formed by Pilot Offshore Renewable Energy (PORL) and Atkins Ltd. PORL is an Aberdeen based joint venture between MacAskill Associates Limited and Renewable Energy Ventures (Offshore) Limited. Both are Scottish companies with extensive experience in the wind industry. KOWL has been established in order to develop, finance, construct, operate, maintain and decommission the Kincardine Offshore Windfarm. KOWL is applying for the consents required for the windfarm and for the associated transmission works.

1.2. Regulatory Consent

4. Various regulatory consents are required for the construction and operation of the Project. The offshore elements of the Project require a Marine Licence under the Marine (Scotland) Act 2010. This is required for all Project components which fall within the 12 nautical mile (nm) territorial sea limit (e.g. the Offshore Export Cable Corridor). The Marine and Coastal Access Act 2009 covers the license requirements for the Project components which fall outside of the 12nm limit (e.g. Development Area and start of the Offshore Export Cable Corridor).
5. The offshore application will be submitted to Marine Scotland as the regulatory authority for the Scottish Government. Planning permission for the onshore aspects of the Project will be applied for under the Town and Country Planning (Scotland) Act 1997. Aberdeen City Council is the regulatory authority for the onshore application.
6. An Environmental Statement (ES), produced under the Marine Work (Environmental Impact Assessment) Regulations 2007 (as amended) supports the Marine License applications. Through screening the Project was identified as '*an installation for the harnessing of wind power for energy production (windfarms)*' under Annex II of the EIA Directive and cross referenced with the Marine Works (Environmental Impact Assessment) Regulations 2007.
7. Consent is required by Scottish Ministers under Section 36 of the Electricity Act 1989 for the construction, extension and operation of an offshore windfarm development which has a generating capacity of greater than 1MW. The Project is expected to have a maximum capacity of 48MW and therefore the site will require consent under Section 36 of the Electricity Act.

8. In addition, a Habitats Regulations Appraisal (HRA) has been undertaken to assess potential impacts on conservation sites of European importance and inform the requirement for appropriate assessment. The HRA process is separate to the EIA process; however the information from both are intrinsically linked.

2. Project Details

9. The Project is considered a commercial demonstrator site, which will utilise floating foundation technology, and will be one of the world's first array of floating wind turbines. It has been included within the Survey, Deploy and Monitoring scheme for offshore renewable systems (similar to wave and tidal devices).
10. The Project is located south-east of Aberdeen approximately 8nm (15km) from the Scottish coastline and provides suitable water depth for a floating offshore wind demonstrator development (approximately 60-80m) (Figure 2-1).

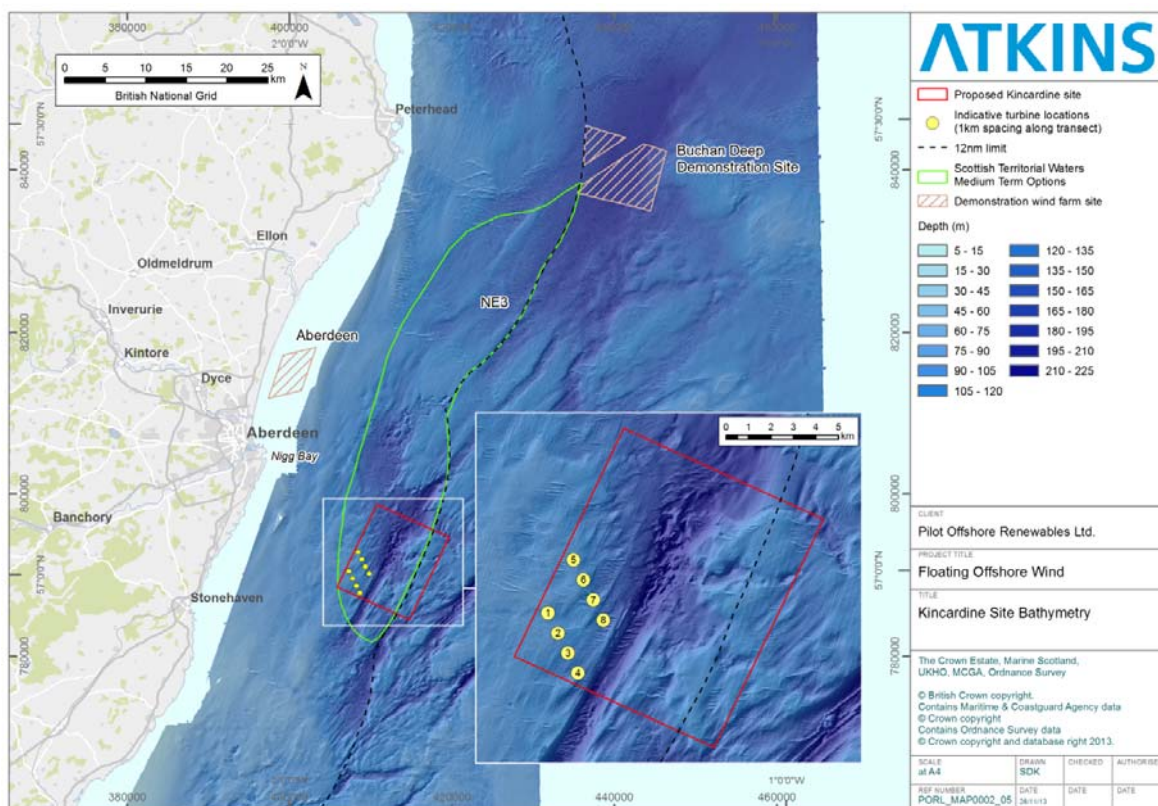


Figure 2-1 Location of the Project

11. The Project will involve the installation of eight 6MW (Mega Watt) wind turbine generator (WTG) units connected by inter-array cables with the resultant power being exported directly to the onshore grid by two 33KV (Kilovolt) Export Cables. These will then connect into the power grid at Redmoss onshore substation, subject to final agreement with the operator.
12. Offshore Export Cables will be buried to a depth of 1.5m where seabed conditions allow. Where burial is not possible, cable protection in the form of concrete mattresses and rock will be required.
13. KOWL plan to use a semi-submersible sub-structure such as the Windfloat semi-submersible prototype (designed by Principle Power) for the proposed development (Figure 2-2). The proposed

sub-structure will require anchors and associated mooring lines to maintain position over the lifetime of the development (25 years).

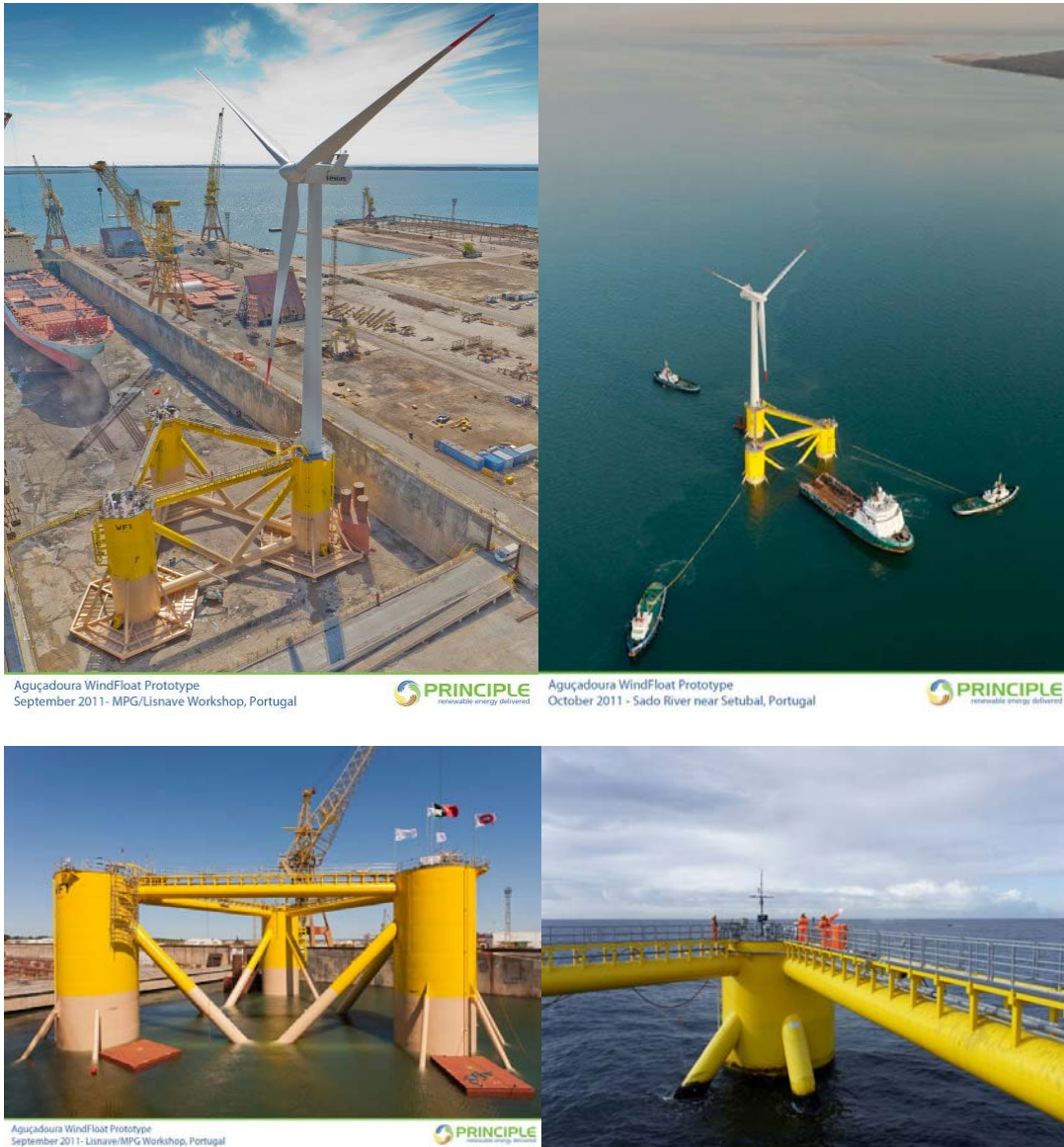


Figure 2-2 Photos of the Windfloat semi-submersible prototype, designed by Principle Power

2.1. Site Selection

14. During the initial period of site selection by KOWL, two potential sites were identified for the Project within Scottish Territorial waters:
 - Forth Array (Firth of Forth, north of St Abbs Head) – a Round 2 development site; and
 - OWNE1 – Aberdeen (Previously NE3)
15. A review of both sites was undertaken based upon resource availability (wind), water depth, grid connectivity, distance from coast, potential for expansion, and wave action.

16. The OWNE1 site is located south-east of Aberdeen and provides suitable water depth for a floating offshore wind demonstrator development. Grid connection and capacity was also available at this location at a limited cost impact (when compared to the Forth Array site). Therefore, this site was selected for the purposes of this Project.

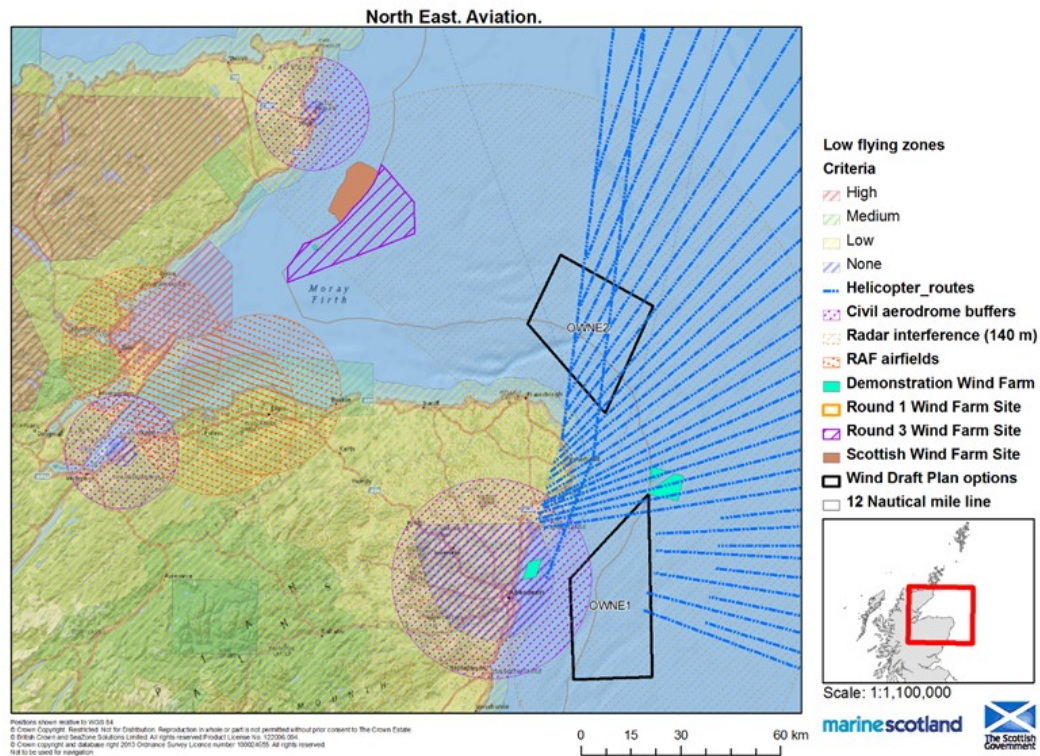


Figure 2-3 Offshore Floating Wind map and updated RGL area OWNE1 (draft)

2.2. Scoping, consultation and public exhibitions

17. In April 2014 KOWL submitted an Environmental Scoping Assessment to Marine Scotland (MS). A Scoping Opinion was received from MS in August 2014. It details the views of statutory consultees and what they deem necessary for inclusion in the ES. Following receipt of the Scoping Opinion each issue raised was reviewed and implications to the overall Project, as well as the EIA, were considered and assessed, where necessary.
18. Where appropriate, further meetings and discussions were held, generally on a topic specific basis, throughout the EIA. These were necessary to refine the scope of EIA studies, based on the Scoping Opinion received and/or results of EIA studies as they became available.
19. The Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013 require prospective applicants for Marine Licenses for certain activities to carry out public pre-application consultation. A public consultation event was held in Aberdeen on the 18th December 2014 at the Bettridge Centre, Coastal Park, Newtonhill between 1300 and 1900. The public consultation event was advertised in the Press and Journal 3/11/2014 in accordance with the requirements for public consultation (six weeks before the event). The feedback comments from the event are available in the separate Pre-application Consultation Report.

3. Environmental Impact Assessment

20. An EIA has been undertaken to assess the potential impacts of the Project. The impact assessment was undertaken using standard EIA methodologies and guidelines, in accordance with the legislative requirements. In addition the EIA has been informed by Project specific surveys and studies.
21. EIA is a legally-defined process which sets out how the environmental impacts resulting from a proposed project are identified and considered from the early stages of discussion through to the construction stage. The emphasis is on identifying and preventing or reducing the potential impact rather than mitigation and restoration once the impact has occurred.
22. The EIA process begins at an early stage in a project. It starts before the final engineering design and construction methods are determined. The Design Envelope also known as the Rochdale Envelope approach is undertaken allowing the worst case scenario to be assessed. If the worst case scenario is assessed as not having a significant impact then all the other development scenarios, as long as all the individual parameters are within the Envelope, can be concluded to not have a significant impact. The project design scenarios considered to result in the greatest environmental impact can vary between topics and were therefore defined in each chapter of the ES (from Chapter 3 to Chapter 16).
23. Early in the assessment process through a combination of site surveys, consultation and desk based research an environmental baseline is established for each of the receptors assessed. Once a baseline has been established it is possible to compare the projected impacts from the Project and their significance. These impacts and changes to baseline conditions are evaluated and given a significance level.
24. The following sections summarise the findings of the EIA surveys and studies. They are presented in the same order as the impact assessment chapters in the ES. Each section provides an overview of the environmental baseline, key impacts identified, relevant mitigation measures and monitoring that will be implemented, and an assessment of whether the identified impacts are determined to be significant or not post mitigation. Within the EIA impacts were determined to be significant if it was considered that they could potentially cause a major positive or negative change to baseline conditions which cannot be mitigated against.

3.1. Physical Environment

3.1.1. Existing Environmental Conditions

25. Characterisation of the existing physical environment and coastal processes is based on both existing and site-specific survey data that was collected as part of the EIA process.
26. A review of existing data, collected over 34 years, shows that waves in the area are mainly from the north-north-east (NNE), arriving every 3 – 5 seconds and are up to 2m high. Larger waves (1.5 – 7m) occur in the winter (November to March), while smaller waves (0-1.5m) were recorded mainly in summer (between May and September).
27. The deep water in the Development Area means that wave action at the site is unlikely to influence the movement of sediments on the seabed. This will likely only be caused by currents. Annual predicted current distribution indicates that currents flow in a NNE-SSW direction at speeds of 0.3ms^{-1} for 50% of the time.
28. Results from the desk based study and drop down video (DDV) survey identified that in both the Development Area and the Offshore Export Cable Corridor, the seabed is composed of medium and fine sand. The DDV surveys show ripples on the seabed, which suggest that the seabed

across the Development Area and Offshore Export Cable Corridor is 'active' (i.e. the sand particles move). Ripples form when sediment is transported across the seabed (known as 'bedload transport'), and to in the water column (known as 'suspended load transport').

29. The DDV survey also shows that there is sediment suspended in the water column in the Project site. The DDV shows less suspended sediment in the Development Area than the Offshore Export Cable Corridor. This result is expected due to the deeper water depths in the Development Area, where waves are less likely to disturb the seabed.

3.1.2. Potential Impacts

30. During the laying and decommissioning of the inter-array cables and deployment and removal of anchors in the Development Area there is the potential for increased suspended sediments in the water column as the seabed is disturbed by potential vessel movement, equipment and as the cables and anchors are placed and removed.
31. The export cable laying process will likely involve a combined process of dredging (possibly), laying and burial all occurring sequentially along the cable corridor. Therefore the majority of the sediment that is displaced during dredging will be replaced during the burial process. However, there will be some increase in suspended sediment concentrations during cable laying. Export cable laying is the only process to be considered for the Offshore Export Cable Corridor as the cable will be buried to reduce impact on the seabed. Currently there are no plans to decommission the cable but leave it in place indefinitely, depending on the market conditions during the decommissioning phase.
32. During the operational phase of the Project there is the potential for scour erosion to occur around the base of the anchors and/or around the inter-array cables and any rock/concrete that is laid on top of the export cable where burial was not possible.
33. The table below summarises the impacts which were considered during the assessment from the Project on the physical environment. The assessment has concluded that the predicted impacts are not significant. This is mainly due to the naturally dynamic nature of the mobile sandy sediments identified in the Development Area and the Offshore Export Cable Corridor, and the small scale of the Project.
34. Cumulative impacts were also considered as part of the EIA. This involved the assessing the impacts in the Development Area and Export Cable Corridor together, as well as the Project as a whole with other consented windfarms and developments (such as the expansion of Aberdeen Harbour at Nigg Bay) within 50km of the Project. Due to the small scale of the Project and the limited areas that would be impacted by increases in suspended sediment concentrations, no cumulative impacts are predicted.

Table 3-1 Identified residual impacts resulting from the Project on the Physical Environment (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area					
Increased suspended sediment concentrations (SSC) during deployment/removal of inter-array cables on/off seabed	X		X	Not significant	<ul style="list-style-type: none"> Limited volume of sediment that will be displaced. Sand particles will settle back to the seabed very quickly limiting the area that can be impacted. No sensitive environments in the area. Temporary nature of disturbance to seabed.
Increased SSC during deployment/removal of anchors on/off seabed	X		X	Not significant	<ul style="list-style-type: none"> Limited volume of sediment that will be displaced. Sand particles will settle back to the seabed very quickly limiting the area that can be impacted. No sensitive environments in the area. Temporary nature of disturbance to seabed.
Increased SSC due to scour erosion around inter-array cables on seabed		X		Not significant	<ul style="list-style-type: none"> Any erosion will only impact the seabed in very close proximity to the cables, and will therefore only be a small amount of sediment that is disturbed as the cables have a small diameter (180mm).
Increased SSC due to scour erosion around anchors cables on seabed		X		Not significant	<ul style="list-style-type: none"> Scour erosion is likely to occur around the anchors. However, the amount of sediment in suspension will not be significantly greater than baseline conditions due to the already active nature of the seabed.
Changes to seabed morphology			X	Not significant (positive)	<ul style="list-style-type: none"> A fishing exclusion zone around the windfarm will reduce anthropogenic (human) disturbance from activities such as trawling. This could result in the seabed being able to stabilise more than is currently possible which is beneficial for benthic (species which live in the seabed) communities. However, due to the active nature of the seabed, there is limited potential for the seabed to ever be completely stable (non- changing).
Offshore Export Cable Corridor					
Increased SSC due to dredging and burial the export cables	X			Not significant	<ul style="list-style-type: none"> Potential for the increased SSC is high during cable laying. However, the process will occur very gradually along the corridor reducing the overall magnitude of the potential for elevated SSC. Maximum extent of dispersal of the sediments in suspension is 1km and there are no sensitive environments within this distance.

3.2. Benthic Ecology

3.2.1. Existing Environmental Conditions

35. The benthic (seabed) environment including habitat and ecology, was characterised following a review of published information and site surveys carried out in 2013 and 2014. The survey took drop-down video footage (DDV) and grab samples for sediment particle analysis. The benthic environment was classified according to the established marine habitat classification system developed by the Joint Nature Conservation Committee (JNCC).
36. The sandy seabed found in both the Development Area and the Offshore Export Cable Corridor are similar to the surrounding sediments in the wider North Sea. In the Development Area the sediment is classed as 'offshore sand' (greater than 50m depth). The dominant sediment type in the Offshore Export Cable Corridor is classed as 'fine sand'.
37. These sandy habitats only support a few animals. Typical species found in these habitats include starfish, hermit crabs and dead man's fingers (a type of sponge). In addition, numerous flatfish were observed at the site, however visibility on the DDV was not clear enough to identify the species.
38. The site is not within any designated sites of conservation importance.

3.2.2. Potential Impacts

39. Direct temporary disturbance of the seabed and associated benthic ecology in the Development Area and Offshore Export Cable Corridor will occur as a result of seabed preparation for substructure anchors, inter-array cable burial, temporary anchoring of vessels and activities associated with the installation. In addition there is the potential for loss of habitat in the Development Area caused by the placement of anchors and inter-array cables.
40. The installation of the WTGs and associated anchorage may introduce an artificial reef effect. The anchors, mooring lines, possible rock armour protection for cables and underwater portions of the structures may provide habitat for colonising animals and plants.
41. Electro-magnetic field (EMF) effects on benthic animals are poorly understood, however laboratory based studies have demonstrated that magnetic fields do not have significant adverse effects on the survival and reproduction of several commonly occurring benthic animals. Effects for heat released from the cables is thought to be undetectable against natural fluctuations in the surrounding sediments.
42. It is predicted that trawling activities which currently take place within the Development Area will be restricted in this area due to the presence of the WTGs and associated substructures. A restriction of fishing activities such as trawling would result in reduced disturbance to the benthic environment which may allow the benthic habitat to stabilise and therefore increase biodiversity locally.
43. The table below summarises the impacts which were considered during the assessment from the Project on benthic ecology. The assessment has concluded that the predicted impacts on benthic ecology are not significant. This is due to the low sensitivity of identified habitats and species coupled with the small size and scale of the Project.
44. The impacts assessed as having a potential cumulative effect over the construction, operation, maintenance and decommissioning phases are the same as the Development and Offshore Export Cable Corridor in isolation and are not significant.
45. No cumulative impacts from the Project combined with other Projects, with respect to the benthic ecology are predicted as the sites are considered to be sufficiently distant to the Project.

Table 3-2 Identified residual impacts resulting from the Project on Benthic Ecology (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area					
Temporary disturbance	X	X	X	Not significant	<ul style="list-style-type: none"> The total area of habitat disturbance is very small and estimated to be only 0.129km². The habitat is widely represented in the region and is naturally turbid (high suspended sediment levels). Sensitivity of habitats and species are determined to be low – they are naturally adapted to sandy, turbid environments. Low number and diversity of species observed at the site. Short term construction phase. Total area of annual disturbance from operation is small, localised and temporary.
Loss of Habitat	X			Not significant	<ul style="list-style-type: none"> The total area of habitat loss is very small and estimated to be only 0.129km² from anchors and inter-array cables. The habitat is also widely represented in the wider area and is naturally turbid. Sensitivity of habitats and species are determined to be low.
Colonisation of introduced substrate		X		Not significant	<ul style="list-style-type: none"> Infrastructure will be coated with antifouling coatings to inhibit marine organism growth. Maintenance of infrastructure may include cleaning to remove marine growth before maintenance activities can be carried out. Sensitivity of habitats and species are determined to be low. The area of change will be very small due to the small size and scale of the Project.
Responses to electromagnetic fields (EMF) and thermal emissions		X		Not significant	<ul style="list-style-type: none"> Studies have stated that if the distribution of habitats are the same or very similar in the surrounding area, impacts of EMF or thermal emissions will be localised and in very close proximity to the inter-array cables. The habitat is widely represented in the region. Sensitivity of habitats and species are determined to be low.
Protection of benthic habitats due to restricted trawling		X		Not significant (Positive)	<ul style="list-style-type: none"> Limited trawling activity occurring in the Development Area. The habitat is widely represented in the region. Sensitivity of habitats and species are determined to be low. Small size and scale of the Project.
Offshore Export Cable Corridor					
Temporary disturbance	X	X		Not significant	<ul style="list-style-type: none"> The total area of habitat disturbance is very small and estimated to be only 0.045km². The habitat is widely represented in the region and is naturally turbid. Sensitivity of habitats and species are determined to be low.

				<ul style="list-style-type: none"> • Small quantity and diversity of species observed at the site. • Short term construction phase. • Effects will be localised and temporary. • Fast recovery time of species.
Loss of Habitat	X		Not significant	<ul style="list-style-type: none"> • The total area of habitat loss will be very limited as cables will be buried to 1.5m where possible and cable protection used where necessary. • The habitat is widely represented in the region and is naturally turbid. • Sensitivity of habitats and species are determined to be low. • Small quantity and diversity of species observed at the site.
Colonisation of introduced substrate		X	Not significant	<ul style="list-style-type: none"> • Restricted to the protection of the export cables which is likely to be a very small area and localised. • Sensitivity of habitats and species are determined to be low.
Responses to electromagnetic fields and thermal emissions		X	Not significant	<ul style="list-style-type: none"> • Target burial depth of the export cables is 1.5m which will reduce the interaction with benthic species. • Sensitivity of habitats and species are determined to be low.

3.3. Fish and Shellfish Ecology

3.3.1. Existing Environmental Conditions

46. As mentioned above, the Development Area and the Offshore Export Cable Corridor are characterised by a marine environment which occurs widely across the North Sea. Therefore fish and shellfish species and populations that are supported by such habitats are also expected to be characteristic of the surrounding region.
47. Information on the species within the vicinity of the Project was obtained from a detailed review of the existing literature and supported by the DDV survey undertaken. The DDV survey provided information on the fish and shellfish habitat types found on site.
48. The region is characterised by:
- Pelagic fish (those that inhabit the water column) such as herring, mackerel and sprat;
 - Demersal fish (bottom feeders that live on or near the seabed) such as cod, haddock, flatfish species and sandeel;
 - Elasmobranchs (sharks, skates and rays) such as spurdog, tope, common skate and spotted ray;
 - Migratory fish (those that are known to migrate through the area and who spend only part of their life cycle in the marine environment) such as Atlantic salmon, sea trout, eel and lamprey species; and
 - Shellfish species, including crabs, lobsters, *Nephrops*, scallops and squid (although not technically shellfish, squid are included here as fish landing statistics put them in this group).
49. Several species of fish and shellfish found in the region are of commercial importance both locally and regionally such as scallops and squid. In addition, some species are of conservation importance due to their rarity or sensitivity such as sandeel and Atlantic salmon.

3.3.2. Potential Impacts

50. The potential impacts on fish species were assessed through detailed characterisation of the Project area and surrounding region. This included information on whether certain fish species are more prevalent than others or if they are more sensitive to potential environmental change.
51. Installation of anchors, mooring systems and inter-array cables in the Development Area will result in habitat disturbance and habitat loss. Habitat disturbance/loss may interrupt spawning or feeding behaviours and deter species from traditional nursery grounds and migration routes, temporarily disturbing the local populations of fish and shellfish.
52. A variety of sources of noise from construction activities including cable laying, rock placement (as worst case) trenching and medium sized vessels may elevate noise levels within the Development Area and cause adverse effects on fish.
53. Installation of floating offshore structures removes nearly all site construction noise as the units are constructed in port, towed to the site then moored in position, with no piling activities required. Construction related noise is therefore either not generated or significantly reduced as a result of the following:
- No piling;
 - The WTG installation vessels spend a limited time on site during construction; and
 - KOWL is a small scale development with a short on-site construction phase.

54. Noise levels are not classed as significant as they will not cause death, physical injury or traumatic hearing loss for cable laying, rock placement, trenching or vessel noise (medium sized vessels) to fish and shellfish.
55. Installation of project infrastructure will create a new habitat and create an artificial reef effect.
56. The table below summarises the impacts which were considered during the assessment from the Project on fish and shellfish ecology. The predicted impacts of the Project on the fish and shellfish are determined to be not significant. This is predominantly due to the low sensitivity of identified habitats and species coupled with the small size and scale of the Project.
57. The impacts identified and assessed as having a potential cumulative effect over the construction, operation, maintenance and decommissioning phases for the Development Area and Offshore Export Cable Corridor are the same as identified in the Development Area and Offshore Export Cable Corridor in isolation.
58. The potential impacts identified as having a cumulative effect from the Project combined with other Projects are classed as not significant. Predominantly due to the small size and scale of the Project and the wider availability of similar habitats in the region

Table 3-3 Identified residual impacts resulting from the Project on Fish and Shellfish Ecology (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area					
Temporary disturbance	X	X	X	Not significant	<ul style="list-style-type: none"> Total area of habitat disturbance very small and only 0.129km². Spawning and nursery areas also occur over a much wider geographical area than just the Project area. Similar habitat types exist within the wider region for food foraging activities. Temporary avoidance behaviours may occur during the small construction phase.
Loss of Habitat	X			Not significant	<ul style="list-style-type: none"> Total area of habitat disturbance very small and only 0.129km². Spawning and nursery areas also occur over a much wider geographical area than just the Project area. Similar habitat types exist within the wider region for food foraging activities. Species will be able to use similar, adjacent habitats and will not be affected at a population level.
Disturbance or Physical injury resulting from noise	X	X	X	Not significant	<ul style="list-style-type: none"> Decreases in feeding activity is unlikely to cause long term effects on wider fish populations due to the widespread distribution of similar feeding grounds. Spawning and nursery areas also occur over a much wider geographical area than just the Project area.
Creation of a new habitat from Project infrastructure		X		Not significant	<ul style="list-style-type: none"> Infrastructure will be coated with antifouling coatings to inhibit marine organism growth. Maintenance of infrastructure may include cleaning to remove marine growth before maintenance activities can be carried out. Habitat is not likely to change over a large extent and is considered to be negligible within a wider geographical context.
Creation of a fish aggregation device (FAD)		X		Not significant	<ul style="list-style-type: none"> Given the small size and scale of the Project and distance between wind turbines, a significant FAD effect is not expected.
Effect on fish and shellfish resources due to reduced fishing pressure		X		Not significant (Positive)	<ul style="list-style-type: none"> It is likely that no fishing activity will occur within the Development Area due to the exclusion/safety zones which will be put in place. Whilst being important locally to fishermen the area is not extensively fished.
Effects of EMF and thermal emissions		X		Not significant	<ul style="list-style-type: none"> As the Development Area is located in water depths of >50m migration routes are unlikely to coincide with the Development Area. Studies at Robin Rigg windfarm identified no significant difference in the distribution of electro sensitive elasmobranchs along the cable corridor after two years of monitoring.

Offshore Export Cable Corridor				
Temporary disturbance	X	X	Not significant	<ul style="list-style-type: none"> Total area of habitat disturbance very small and only 0.129km². Spawning and nursery areas also occur over a much wider geographical area than just the Project area. Similar habitat types exist within the wider region for foraging activities. Temporary avoidance behaviours may occur during the small construction phase.
Responses to electromagnetic fields (EMF) and thermal (heat) emissions		X	Not significant	<ul style="list-style-type: none"> Studies at Robin Rigg windfarm identified no significant difference in the distribution of electro sensitive elasmobranchs along the cable corridor after two years of monitoring Salmon are reported to predominantly swim in the top 10m of the water column so they will be away from the cables. It is considered that EMF impacts to salmon from subsea cables will not be present in water depths greater than 20m.

3.4. Marine Mammals

3.4.1. Existing Environmental Conditions

59. The Aberdeen area is an important area for marine mammals, with up to 18 species recorded from sighting or stranding records in Aberdeen Bay and the surrounding area; including fifteen species of cetaceans (porpoise, dolphins and whales) and three species of pinniped (seals). Of these, Bottlenose Dolphins, Harbour Porpoises, White-beaked Dolphins, Minke Whales, Risso's Dolphins, Harbour Seals and Grey Seals occur regularly in the area, with other species only being recorded occasionally or rarely (AOWFL, 2012; EOWDC surveys).
60. This baseline environment has been compiled using existing (published) information, combined with the findings of the site specific HiDef aerial surveys undertaken in 2013 and 2014. Over the whole survey period, a total of 138 sightings were recorded. 111 sightings were identified as mammals to species level.
61. The results of the surveys show that Harbour Porpoise are the most abundant species in the Project area, with Grey Seal, Harbour Seal, White-beaked Dolphin and Minke Whale also recorded. Table 3-4 summarises the abundances of the identified marine mammal species per survey flight and a total abundance over the whole survey period.

Table 3-4 Summary of aerial survey effort and observations

Survey Date	Species Abundance				
	Harbour Porpoise	Minke Whale	White-Beaked Dolphin	Grey Seal	Harbour Seal
May 2013	0	0	0	0	1
May 2013	13	1	0	0	0
June 2013	7	0	0	0	0
July 2013	15	0	9	0	0
September 2013	2	0	0	0	0
October 2013	6	0	0	2	0
October 2013	2	0	0	0	0
December 2013	5	0	0	0	0
January 2014	6	0	0	0	0
February 2014	8	0	0	1	0
March 2014	1	0	0	0	0
April 2014	0	0	0	1	0
May 2014	17	1	0	4	0
July 2014	5	0	0	0	0
August 2014	2	0	0	0	0
September 2014	0	1	0	1	0
Total	89	3	9	9	1

3.4.2. Potential Impacts

62. An increase in vessel activity may result in a temporary barrier effect due to marine mammal avoidance of vessel traffic. This may cause disturbance to marine mammals, especially those which may be foraging in waters local to the Project. In addition, behavioural changes in species due to avoidance during mating and breeding periods may have an impact on a population as a whole. An increase in vessel activity may also lead to an increase in collision risk, with vessel strikes being a known cause of mortality for marine mammals.
63. Marine mammals have very good underwater hearing and as a consequence are sensitive to increased underwater noise. Marine mammals rely on sound for navigation and for social interactions. Underwater noise may result in physical harm, temporary or permanent hearing loss,

altered behaviours or patterns of movement. Increased noise may mask important biological sounds and cause increased vulnerability to predation and other hazards.

64. The transmission of electricity through subsea cables generates electric and magnetic fields. It has been suggested that electromagnetic fields (EMF) could affect marine mammals, as they use geomagnetic cues as an aid to navigation.
65. With the increasing deployment of marine renewable devices, a number of species are at risk of collision or entanglement with mooring lines. Of more concern than the entanglement risk presented by the moorings themselves is entanglement with derelict fishing gear which becomes caught / snagged amongst the moorings and devices, known as 'ghost fishing'.
66. Chemicals may be released into the marine environment as a result of accidental incidents, for example, vessel collisions and accidental spillages. Chemical pollutants may reduce the health and fitness of a range of marine mammal species.
67. Table 3-5 summarises the impacts considered in the Impact Assessment for marine mammals. The predicted impacts of the Project on marine mammals are determined to be not significant.
68. Cumulative impact were assessed for the different components of the Project (Development Area and Offshore Export Cable Corridor). The assessment concludes that all impacts will be of minor significance or lower.
69. Cumulative impacts with other projects have been assessed. The assessment concludes that all impacts will be of minor significance or lower.

Table 3-5 Identified residual impacts resulting from the Project on Marine Mammals(C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area					
Disturbance or displacement of species	X		X	Not significant	<ul style="list-style-type: none"> There is no evidence of marine mammals avoiding windfarms during operations due to noise. Any noise generated during construction or decommissioning will be temporary. Potential noise impact is considered to be very limited for offshore floating wind installations. Long-term avoidance behaviours are considered to be very local and small scale compared with the large area over which marine mammals move.
Increase noise resulting in physical or behavioural changes	X		X	Not significant	<ul style="list-style-type: none"> Any noise generated during construction or decommissioning will be temporary. Potential noise impact is considered to be very limited for offshore floating wind installations.
Collision/vessel strikes (including corkscrew injuries)	X		X	Not significant	<ul style="list-style-type: none"> During the construction, operation and decommissioning phases of the project, vessels will be slow moving and predictable, both for safety and operational reasons. Species are highly mobile All materials used in the construction, operation and maintenance and decommissioning phases will be certified for safe use within the marine environment. Vessels will use predefined routes and will travel at low speeds to reduce risk of accidental collision.
Responses to Electromagnetic fields (EMF)		X		Not significant	<ul style="list-style-type: none"> Information on the influence of EMF on marine mammals is very limited and inconclusive. There is no evidence to date to suggest a change in marine mammal activity related to EMF from offshore windfarm cabling.
Entanglement		X		Not significant	<ul style="list-style-type: none"> There are no current records of marine mammal entanglements in moorings or other offshore infrastructure. Cables and moorings will be regularly checked to ensure no debris or fishing gear has become caught.
Contamination	X	X	X	Not significant	<ul style="list-style-type: none"> Serious contamination events are considered unlikely. Best practices and guidance will be used and appropriate navigational aids will be in place. All materials used in the construction, operation and maintenance and decommissioning phases will be certified for safe use within the marine environment. Vessels will use predefined routes and will travel at low speeds to reduce risk of accidental collision.
Disturbance to prey species	X			Not significant	<ul style="list-style-type: none"> Habitat loss leading to a reduction in prey species is a potential indirect impact to marine mammals, it is unlikely that the Project will result in a significant loss of marine habitat
Offshore Export Cable Corridor					

Disturbance or displacement of species	X		X	Not significant	<ul style="list-style-type: none"> • Same as Development Area.
Increase noise resulting in physical or behavioural changes	X		X	Not significant	<ul style="list-style-type: none"> • Any noise generated during cable burial operations will be temporary. • Potential noise impact is considered to be very limited for offshore floating wind installations.
Entanglement			X	Not significant	<ul style="list-style-type: none"> • Export cables will be buried to a depth of 1.5m and will therefore not pose a risk to marine mammals.
Responses to Electromagnetic fields (EMF)			X	Not significant	<ul style="list-style-type: none"> • Same as Development Area
Contamination	X	X	X	Not significant	<ul style="list-style-type: none"> • Same as Development Area.
Disturbance to prey species			X	Not significant	<ul style="list-style-type: none"> • Same as Development Area.

3.5. Birds (Ornithology)

3.5.1. Existing Environmental Conditions

70. The Project is not within a designated marine protected area, however, the local waters support internationally important bird species. The separate Habitat Regulations Appraisal details the designated areas of conservation in proximity to the Project.
71. Monthly bird surveys were carried out over a period of 16 months from May 2013 to September 2014. Overall a total of 20,460 birds of 19 species were observed. Species included kittiwake, guillemot, fulmar, herring gull, razorbill, puffin, gannet, sandwich tern, non-breeding eider and lesser black backed gull.

3.5.2. Potential Impacts

72. The existing level of vessel traffic within the area is deemed as intermediate to moderately busy compared to other regions of UK waters. The current use of the Development Area varies throughout the year. An average of 55 vessels per day passed within 10nm of the Development Area. Increased vessel movements may cause temporary disturbance or displacement to bird species.
73. In addition increased vessel activity may lead to increased risk of vessel collision, which may result in an accidental release of fuel and other chemicals. Environmental contamination from chemicals pose potential health risks to seabirds.
74. During the operation of the windfarm there is the potential for bird collision with the wind turbines.
75. Only Kittiwake and Gannet are estimated to be effected by collision impacts.
76. These impacts will result in estimated mortality from collisions of 0.044% of kittiwake from Fowlsheugh SPA; 0.013% from Buchan to Collieston Coasts SPA, 0.002% from Troup, Pennan and Lions Heads SPA and 0.023% of the Kittiwake population from 16 sites from outside of SPAs.
77. An estimate of 0.002% of the gannet from the Forth Islands SPA population will be impacted and no gannet from outside of SPAs are impacted through collisions with turbines.
78. Displacement impacts are determined to not be significant given the size and scale of the project
79. Gannet, Puffin, Razorbill and Guillemot have the ability to dive to considerable depths to catch food, so there is potential for them to become entangled in mooring lines or in fishing gear or other debris caught on the mooring lines.
80. The table below summarises the impacts which were considered during the assessment from the Project on birds. The predicted impacts of the Project on birds are determined to be not significant.
81. The negligible impacts of the project on birds mean any potential cumulative impacts from the Project combined with other Projects are determined to not be significant.

Table 3-6 Identified residual impacts resulting from the Project on Birds (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area					
Disturbance or displacement of species	X		X	Not significant	<ul style="list-style-type: none"> Increased vessel activity is determined to be negligible in relation to existing vessel traffic in and around the Development Area. Construction activities will be phased and are small scale. Additional vessel traffic will likely be confined to pre-defined traffic corridors. It is unlikely that a windfarm of this size or scale would cause displacement during operation. Maintenance activities will be limited and localised.
Collision with wind turbines		X		Not significant	<ul style="list-style-type: none"> The impact will result in changes, but these will be small in scale, temporary and within 'acceptable' limits. For example where an adverse change in population growth is small, temporary or not considered likely.
Contamination	X		X	Not significant	<ul style="list-style-type: none"> If a pollution event was to occur the effects would be local and the overall impacts small. Emergency procedures will be in place to minimise environmental effects as much as possible. All materials used in the construction, operation and maintenance and decommissioning phases will be certified for safe use within the marine environment.
Entanglement		X		Not significant	<ul style="list-style-type: none"> Mooring lines will be routinely maintained and checked for debris. Measurements of the strain on the mooring lines will be undertaken at all times to identify any snags by lost fishing nets and thus remove the potential for entanglement by birds.
Disturbance to prey species	X		X	Not significant	<ul style="list-style-type: none"> Similar habitats are available in the wider surrounding area. Construction and decommissioning will be short in duration and small scale.

3.6. Underwater Noise

3.6.1. Existing Environmental Conditions

82. Background noise levels underwater often arise from shipping, industrial activities and other anthropogenic noise, ocean turbulence, wind, rain and biological sources (such as marine life).
83. The Project will produce noise levels that will add to background levels and have the potential to cause a variety of effects on marine species, predominantly marine mammals and fish. During construction, increased noise will originate from a range of expected activities such as cable laying, installation of anchors, cable trenching and vessel movements.

3.6.2. Potential Impacts

84. Underwater noise has the potential to result in adverse impacts on marine mammals and fish species. At one extreme the loudest noise can generate a substantial pressure that is sufficient to injure or kill an animal. Noise at a lower level can have less extreme effects such as damage to an animal's auditory sense. At the other end of the scale a quieter noise will not cause any harm to an animal but may trigger a behavioural response, which, at sufficient volume, will cause the animal to flee the area to escape the high noise levels.
85. The sound pressures required for physical injury or mortality are universal across species. Other effects, for example the noise level required to elicit a behavioural response, are species dependent. In order to judge the potential of a noise to cause avoidance, it is necessary to understand the perception of the sound by the species, i.e. how loud the sound appears to individuals of that species. Individuals of species having poor hearing may perceive the level as low, and hence not react to the noise, whereas a species that is sensitive may find the level unbearably loud and react by swimming away. It is therefore key to understand the hearing ability of the species that may be affected.
86. Modelling of noise ranges of project activities has been used to understand the likely area where an avoidance reaction will be elicited by a range of species. SPEAR modelling of the Project activities shows that the Project activity identified as having the greatest noise impact range for cetaceans is trenching of the Offshore Export Cable. The Project activity with the greatest noise impact range for pinnipeds is rock placement. The activity causing the greatest impact range for fish is rock placement or cable laying (depending on the fish species). None of the Project activities are considered likely to cause noise at a level that would result in auditory injury.
87. The behavioural response ranges identified through SPEAR modelling of the Project activities represent a tiny impact area when compared to the noise range of impact piling (which is traditionally used for offshore windfarm developments).
88. The information presented on noise impact ranges in this chapter has been used to inform the assessment of impacts of underwater noise on fish and marine mammals (see Chapter 5 and Chapter 6).
89. Operational noise impacts from the substructure (such as wave impact on the structure and ballast water systems) are currently unknown as there has been no previous deployment of such a large floating offshore wind turbine. One of the key aims of the initial deployment period and one of the primary elements of the survey, deploy and monitor scheme will be to undertake noise measurements. This will include noise measurements of the WTGs and the O&M vessels servicing the site.

3.7. Maritime Navigation

3.7.1. Existing Environmental Conditions

90. The primary navigational issue is the proximity of the Project to Aberdeen Harbour. The Development Area has moderate vessel traffic levels. High levels of traffic to the west and north west of the Project are associated with traffic bound to or from Aberdeen Harbour or Peterhead. A disposal area is located 10.9km north west of the Project and is used by Aberdeen Harbour authority for the disposal of spoil from harbour maintenance dredging. There is no existing oil and gas infrastructure within the vicinity of the Project, with the closest existing oil and gas infrastructure located approximately 36km north of the Project.
91. Both the marine traffic and satellite fishing data showed that there were limited fishing vessel movements in the site area, and those that were recorded were passing through rather than engaged in fishing activities.
92. Recreational vessel movements in the area of the Project are seasonal. There are limited movements during the winter period due to the exposed nature of the coastline. In contrast there is an increase in activity during summer months, mostly associated with a general increase in recreational cruising around the UK coast.

3.7.2. Potential Impacts

93. During construction/decommissioning of the Development Area the key impact for maritime navigation is impacts on safety operations of vessels including commercial, recreational, fishing, port operations and impacts on marine emergency response.
94. In addition, fishing vessels, especially those towing gear, are at risk from snagging hazards associated with the export cable but also the anchor and mooring spread which extends approximately 9 x water depth from the turbine (noting that touchdown of the cables will be within 250m of the floating substructure).
95. The table below summarises the impacts which were considered during the assessment from the Project on maritime navigation. The predicted impacts of the Project on maritime navigation are determined to be not significant with the considerations of embedded and additional mitigation measures. Similarly, cumulative impacts with other developments and consented windfarm were also found to not be significant.

Table 3-7 Identified residual impacts resulting from the Project on Maritime Navigation (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area and Offshore Export Cable Corridor					
Impacts on commercial vessel safe operations - Increased risk of collision with construction/decommissioning vessels - Increased risk of collision with transiting vessels due to windfarm. - Collision risk to transiting vessels if the structure breaks free and becomes a 'floating hazard'. - Impacts on adverse weather routeing and anchoring - Snagging and anchoring risks to vessels	X	X	X	Not significant	All impacts reduced either through embedded mitigation or further mitigation including: <ul style="list-style-type: none"> Risk will be reduced through construction planning which will include Work Vessel Coordination. Safety/exclusion zones (500m) and buoyed construction areas will be in place to advise other marine users of safe passing distances and current areas of activities. KOWL have committed to the presence of a guard vessel and cardinal buoys to ensure there is a 24hr presence on site during construction / decommissioning. Inspection and maintenance to ensure the mooring lines, anchors and cables have not deteriorated. Operational safety zones of 50m around each WTG. Export cables buried to a depth of 1.5m. Any additional cable protection will be risk assessed to ensure there are no clearance issues for vessels Fisheries Liaison officer has been appointed for the Project. The operational windfarm will be marked on admiralty charts. Structures within the windfarm will be marked and lit for navigational purposes, with the agreement of the navigational authority. A safety management system (SMS) will be in place. All on site traffic will be controlled through a Works Vessel Coordination Centre.
Impacts on fishing vessel safe operations	X	X	X	Not significant	<ul style="list-style-type: none"> See points above
Impacts on recreational vessels	X	X	X	Not significant	<ul style="list-style-type: none"> See points above
Impacts on vessels engaged in port operations	X	X	X	Not significant	<ul style="list-style-type: none"> See points above
Impacts on Marine Emergency Response	X	X	X	Not significant	<ul style="list-style-type: none"> See points above

3.8. Military Aviation

3.8.1. Existing Environmental Conditions

96. With regard to aviation and radar concerns for offshore wind developments, the main issue identified is the long range radars (both military and civil) in the area. From the KOWL Scoping Assessment it has been identified that no helicopter routes pass near the proposed Development Area and therefore this receptor has been removed from the assessment (for the operational phase of the Project). However, there would be a potential impact to helicopter routes during towing as part of the construction/decommissioning phases and this has been assessed. In the case of this Project, the affected receptors have been identified as:

- The military air defence radar (Buchan) located approximately 4 km south of Peterhead;
- Two civil en-route radar (Allanshill and Perwinnes) located approximately 9 km southwest of Fraserburgh and 6 km north of Aberdeen respectively; and
- Helicopter routes from the mainland over the North Sea (during construction and decommissioning only).

3.8.2. Potential Impacts

97. The following table (Table 3-8) summarises the residual significance of the identified potential impacts on Military Aviation during the construction and installation, operational and maintenance and decommissioning phases of the Project.

98. Radar Interference is the only potential impact that has been considered. Wind turbines can cause radar interference by interacting with the transmitted radar signal. The concern is primarily with regard to false returns. False returns are caused by the rotating turbine blades appearing as targets on the radar screen. When the blades are stationary or moving slowly, they will not create false returns. During the construction, once the turbines are on site they will not be rotating. The turbines will be towed to their final positions from an assembly site. The maximum speed during the tow will be 3.5 knots (1.8m/s), which is highly unlikely to lead to a false return.

99. The table below summarises the impacts which were considered during the assessment from the Project on military aviation. The predicted impacts of the Project on military aviation are determined to be not significant with consideration of additional mitigation measures.

100. There are no cumulative impacts of the Development Area and Offshore Export Cable Corridor in combination with regards to military aviation.

101. The closest wind turbine development, the European Offshore Wind Deployment Centre is located 20 km from the Project and it is currently expected that no cumulative or in-combination impacts are expected from this site. All other sites are considered to be of sufficient distance from the development site that they would have no impact on the in-combination impacts from the development WTG installations.

Table 3-8 Identified residual impacts resulting from the Project on Military Aviation (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area and Offshore Export Cable Corridor (as WTGs are towed to site)					
Radar Interference - Buchan Military Air Defence Radar	X	X	X	Not significant	<ul style="list-style-type: none"> NATS self-assessment it is noted that the development site is highly likely to have an impact on the Buchan radar system. A detailed assessment of the KOWL WTG impacts on this radar system. Impact reduction can be achieved via an upgrade to the current system. KOWL are currently seeking to input into this upgrade programme.
Radar Interference – Allanshill Civil en-route Radar	X		X	Not significant	<ul style="list-style-type: none"> Site is outside of the development envelope. Slow speed of the tow the resulting level of impact is negligible as the radar returns can be removed due to slow speed.
Radar Interference – Perwinnes Civil en-route Radar	X	X	X	Not significant	<ul style="list-style-type: none"> Site is on the edge of the development envelope. Slow speed of the tow the resulting level of impact is negligible as the radar returns can be removed due to slow speed.
Helicopter Routes	X		X	Not significant	<ul style="list-style-type: none"> Tow will occur during fair weather conditions there is expected to be very limited impact on these services. Significant liaison (NATS and Aberdeen Airport) during creation of the detailed installation plan to ensure all risks are managed.

3.9. Landscape, Seascape and Visual

3.9.1. Existing Environmental Conditions

102. The study area for the Seascape Landscape Visual Impact Assessment (SLVIA) was identified through a ZTV (zone of theoretical visibility) analysis from both the floating substructures (12m max height), and WTG (192m max height). Once this area was identified, the next stage of the assessment was to review the existing landscapes, seascapes and visual amenities (viewpoints) that fell within it, and possible receptors that could be affected by the changes.
103. A desktop study was then conducted to identify the Landscape and Coastal Character Types in the study area. This identified that coastal, agricultural heartlands, hill, valleys, open farmland and wooded farmland are present.
104. Viewpoints were selected that were considered to be representative of the main sensitive receptors or receptor groups in the study area. In total 23 viewpoints were selected in consultation with Marine Scotland, Aberdeen City Council, Aberdeenshire Council and SNH. The viewpoints were also chosen in-combination with viewpoints that were considered for the nearest windfarm (European Offshore Wind Deployment Centre (EOWDC)) with which a cumulative impact to landscapes and seascapes may occur to ensure that they provide representative coverage of potential cumulative visibility and related effects.
105. Visual amenity receptors are defined as individuals or groups of people within the SLVIA study area which are predicted to have views of the WTGs and floating substructures. The main groups of visual receptors include;
- Residents;
 - Walkers and climbers; tourists, visitors or users of recreational facilities;
 - Road and rail users; and
 - Marine based receptors including people taking part in water-based recreational activities, and commercial and cruise ships.

3.9.2. Potential Impacts

106. Wirelines and photomontages were produced for six of the viewpoints to assess the potential impact of the WTGs and floating substructures. These photomontages were used as a guide from which all the viewpoints were assessed.
107. The assessment found that there are no significant potential visual impacts of the Project on the identified landscapes. Similarly for the majority of seascapes and viewpoints it is anticipated that the Project will not have a significant impact. However, for two seascapes and one of the chosen viewpoints a significant impact was predicted even after embedded mitigation measures. It is also anticipated that receptors at the identified viewpoints may also experience a significant impact on their views as a consequence of the Project.
108. No cumulative impacts were identified within the assessment. Construction of the windfarm is to be done sequentially so there is no combined effects of the works needed in the Development Area and Offshore Export Cable Corridor. The closest consented windfarm (EOWDC) was considered as part of the assessment through the use of mutual viewpoints, and Aberdeen Harbour expansion at Nigg Bay was also considered. Other consented and proposed windfarms were not considered due to the distance from the Project.
109. The table below summarises the impacts which were considered during the assessment from the Project on identified landscapes, seascapes, viewpoints and receptors.

Table 3-9 Identified residual impacts resulting from the Project on Landscape, Seascape and Visual

Impact	C	O	D	Impact Significance	Discussion
Development Area					
Installation and decommissioning of inter-array cables and anchors	X		X	Not significant	<ul style="list-style-type: none"> All anchor vessels are likely to be sourced locally from Aberdeen, Peterhead or Montrose, so no additional/unusual vessels will be present. Short installation period due to scale of the Project.
Installation and decommissioning of WTGs and floating substructures	X		X	Not significant	<ul style="list-style-type: none"> Limited on-site construction activities as majority of construction takes place in dry docks and both floating substructure and WTG towed to site together to be connected to anchors and inter-array cables. Short installation period due to scale of the Project.
Maintenance of WTGs and substructures		X		Not significant	<ul style="list-style-type: none"> Regular weekly maintenance will be undertaken using small local boats and therefore will not have a significant impact over and above current vessel movements in the area. When WTGs and substructures need to be brought to shore for ad hoc maintenance, this will likely only be one WTG at a time therefore reducing the potential for visual impacts.
Operational windfarm on landscapes, seascapes, viewpoints and receptors		X		<p>Not significant for any landscapes.</p> <p>Significant Impact for some seascapes, viewpoints and receptors.</p>	<ul style="list-style-type: none"> The windfarm will not have a significant impact on any of the identified landscapes due to: <ul style="list-style-type: none"> Small scale of the project and the distance offshore; Matt grey colour of WTGs; Limited additional vessel activity than is already observed; Nature of the views (urbanised/Port actives) that can already be seen; and Low sensitivity of the landscapes. The windfarm will have a potentially significant visual impact on two seascapes, Aberdeen Links and Girdle Ness/Nigg Bay, due to: <ul style="list-style-type: none"> High sensitivity of seascapes as distinctive landform and open/panoramic character. Other seascapes are less sensitive to the potential visual impacts with increasing distance from the windfarm and decreasing sensitivity. Photomontages were used to assess the potential impact to the identified viewpoints. The assessment concluded that there is a potentially significant effect to only viewpoint 10 Downies. The potential impact to visual receptors at viewpoints 8 Coastal Path at Finhon, 10 Downies, 16 and Stonehaven Golf Course was also found to be significant.
Offshore Export Cable Corridor					
Installation of export cables in the Offshore Export Cable Corridor	X		X	Not significant	<ul style="list-style-type: none"> Export cable laying process is anticipated to be less than a week. Size of the vessel will not be larger than other vessels entering/leaving Aberdeen Harbour.

3.10. Marine Historic Environment

3.10.1. Existing Environmental Conditions

110. Within the wider study area (Aberdeen to Stonehaven) thirty wreck sites were identified during the desktop study. These were identified using CANMORE (an online mapping service), a database run by the Royal Commission on the on the Ancient and Historic Monuments of Scotland (RCAHMS).
111. Four of these identified ship wreck sites are within the Development Area and five identified wreck sites within the Offshore Export Cable Corridor. In addition during the desktop study two aviation wreck sites were also identified with the Project site, one in the Development Area and the other in the Offshore Export Cable Corridor (Figure 3-1).

3.10.2. Potential Impacts

112. During the laying and decommissioning of the inter-array cables and anchors in the Development Area there is the potential for increased SSC in the water column as the seabed is disturbed by the cable laying vessel that will be used to install the cables and during the removal of the cables from the seabed during the decommissioning process. There is potential for the suspended sediment to settle out and smother/bury identified wreck sites.
113. The presence of the inter-array cables and anchors on the sea bed around the structures (if laid on the surface) could induce localised scour. This scour would occur during the operational phase of the windfarm.
114. Similarly, trenching and burial of the Offshore Export Cable(s) will also cause a temporary increase in suspended sediment, and there is also the potential for localised scour around any areas of the cables that are buried through rock dumping if it was not possible to re-use the sediments from the trench.
115. The table below summarises the impacts which were considered during the assessment from the Project on the marine historic environment.
116. The assessment concluded that the predicted residual impacts of the Project on the marine historic environment are not significant. This is predominantly due to the mitigation measures that will be implemented. Mitigation measures include undertaking a geophysical survey to provide an accurate location of the wreck sites for informing detailed design of the Offshore Export Cable Corridor and positioning of wind turbine anchors.
117. No cumulative impacts are predicted within the Project (combined effect of Development Area and Offshore Export Cable Corridor) as the installation will happened sequentially and any increases in SSC will be limited in extent. Similarly, no cumulative impacts were identified with other proposed and consented windfarms/developments due to the small scale of the Project, and due to the fact that no impacts are considered significant for the Project.

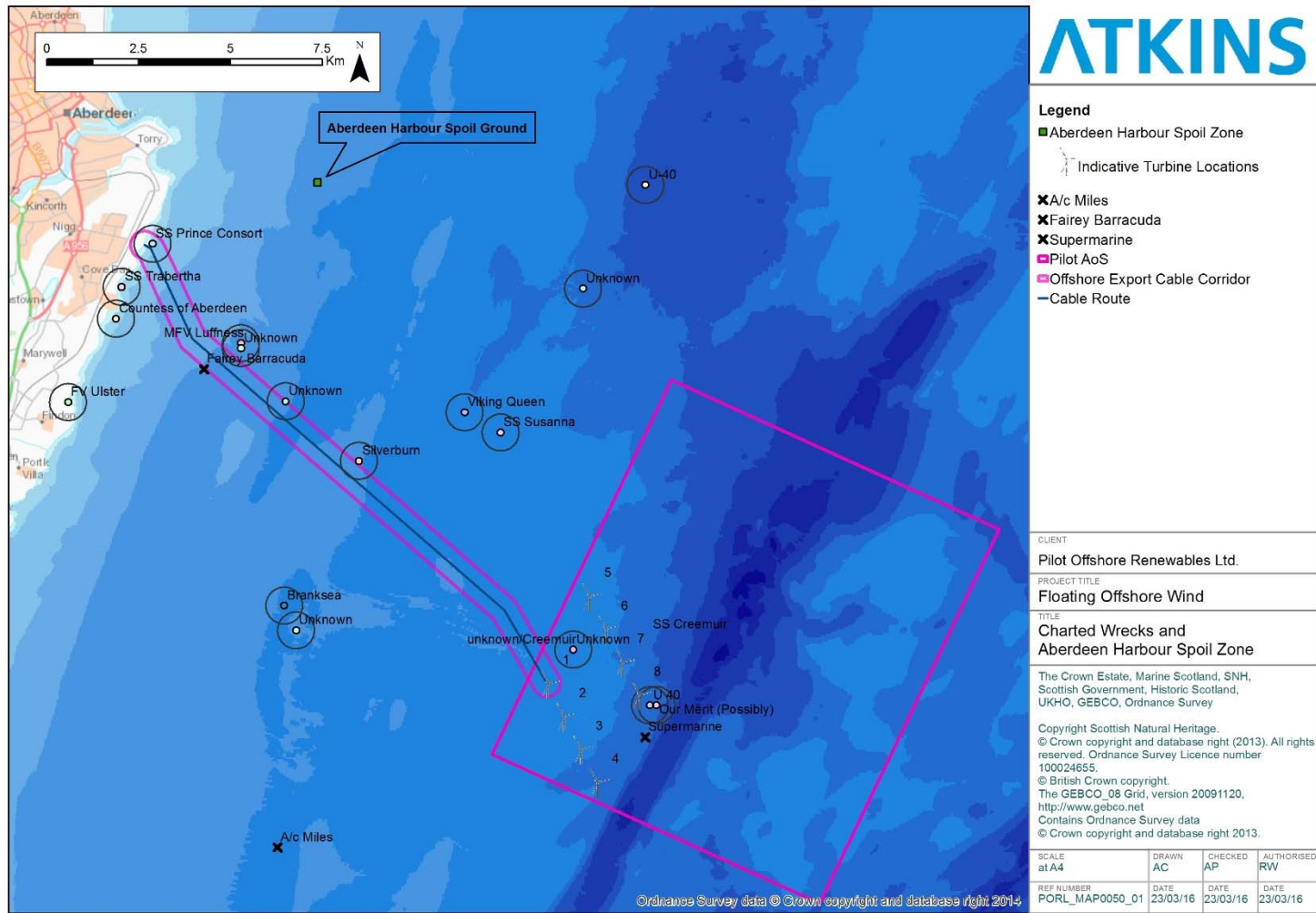


Figure 3-1 Cable route, dredge disposal site and location of ship wrecks within the area of the Project

Table 3-10 Identified residual impacts resulting from the Project on the Marine Historic Environment (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area					
Installation and decommissioning of inter-array cables	X		X	Not significant	<ul style="list-style-type: none"> Small cable diameter, so limited potential of interaction and subsequent damage to wrecks. Cables will be laid on sea floor and avoid wreck sites.
Presence of inter-array cables on seabed/ scour erosion		X		Not significant	<ul style="list-style-type: none"> Minimal amount of sediment will be re-suspended as a result of scour erosion around the inter-array cables Seabed is considered active as sediments are constantly moving between seabed and into the water column, so any additional suspended sediment is likely to be negligible above baseline conditions
Installation and decommissioning of anchors/ mooring lines	X		X	Not significant	<ul style="list-style-type: none"> Footprint of individual anchor is 10x10m, therefore, there is potential for significant destruction of a wreck if an anchor was to be dropped on it Anchor handlers are able to position very precisely to avoid potential damage to wreck sites following geophysical surveys
Presence of four anchors per substructure (32 in total) plus mooring lines.		X		Not significant	<ul style="list-style-type: none"> Minimal amount of sediment will be re-suspended as a result of scour erosion around the anchors Seabed is considered active as sediments are constantly moving between seabed and into the water column, so any additional suspended sediment is likely to be negligible above baseline conditions
Offshore Export Cable Corridor					
Ploughing of trench, cable laying and burial	X			Not significant	<ul style="list-style-type: none"> Some wreck sites fall within the Offshore Export Cable Corridor or the 500m buffer Accurate positing of wreck sites through geophysical surveys would allow detailed design and planning of the cable routes with the corridor to avoid wreck sites. Active nature of the seabed (especially closer to shore) means that wreck sites are subject to frequently smothering and exposure by natural processes
Scour erosion around areas of the export cable(s) that are buried by rock dumping (up to 10%)		X		Not significant	<ul style="list-style-type: none"> Minimal amount of sediment will be re-suspended as a result of scour erosion around the anchors Active nature of the seabed (especially closer to shore) means that wreck sites are subject to frequently smothering and exposure by natural processes

3.11. Socio-Economics

118. The aim of the socio-economic assessment was to assess the impacts of the Project on the socio-economics of the area. The assessment considered both the anticipated economic and employment impacts across the Project area.

3.11.1. Existing Environmental Conditions

119. The population of Aberdeen City was 227,100 and Aberdeenshire 257,700 in 2013. These areas experienced high population growth over the period 2004 to 2013. The population of Aberdeen City and Aberdeenshire grew by 9.3% and 9.8% respectively, both substantially above the average for Scotland at 4.8%. Employment sectors in Aberdeen include:

- Agriculture, forestry & fishing
- Mining & quarrying
- Manufacturing
- Electricity, gas, steam & air conditioning supply
- Water, sewerage, waste management
- Construction
- Wholesale and retail trade
- Transport & storage
- Accommodation & food services
- Information & communications
- Financial & insurance
- Real estate
- Professional, scientific & technical services
- Administration & support services
- Public administration, defence & social care
- Education
- Human health & social work
- Other

120. Visit Scotland identifies top attractions within the Aberdeen and Grampian area. Within Aberdeen City the Art Gallery and Maritime Museum are within the top five attractions in terms of visitor numbers. Tourist trips to Aberdeen and Grampian region amounted to £1.44 million in 2013 and spend of £289m, accounting for 11.8% of total tourist trips to Scotland and 10% of tourist spend across Scotland. Dunnottar Castle at Stonehaven is the only tourist attraction in any proximity to the proposed development, visitor statistics for this historic attraction were not available.

3.11.2. Potential Impacts

121. It is expected that over 50 people could be required to support the construction and installation of the turbines over a two year period. In addition the equivalent of 40 extra jobs are anticipated to be required to assemble the turbines. In addition further indirect jobs would be supported locally and regionally through supply links and income multiplier effects. Employment and economic impacts are determined to be temporary, beneficial effects but which are not significant.

122. Economic impacts resulting from new tourism and recreational activities specifically for boat tour operators are considered positive, although their magnitude is considered to be of minor impact and overall not significant. Impacts on existing tourism and recreational businesses during construction is likely to be a combination of both positive (related increase in local spend or construction workers) and negative (due to short term local disruption around onshore construction works). Both impacts are likely to be minor and not significant. During the operation the impact from loss of scenic visual quality are predicted but will not significantly impact the economic benefit from tourism.

3.12. Commercial Fisheries

3.12.1. Existing Environmental Conditions

123. A desk based review of available data was undertaken and supported by consultation (e.g. Scottish Fishermen's Federation and Marine Scotland). The commercial fisheries methods identified in the area are:
- Dredging for scallops;
 - Demersal trawling for *Nephrops* and squid; and
 - Creeling for lobster, edible crabs and velvet crabs.
124. Low level scallop fisheries are dominant in the Development Area. To a lesser degree, squid is seasonally targeted, often using reconfigured bottom trawls. Low level shellfish fisheries targeting crab and lobster are dominant in the Offshore Export Cable Corridor. Fishing intensity for shellfish increases closer to the shore.
125. During construction and installation safety zones will prevent all vessels, including fishing vessels, entering within 500m of construction working in the Development Area and along the Offshore Export Cable Corridor. The safety zones will be relatively small areas and over very short time frame (only during construction/installation).
126. KOWL will continue to follow the Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison with Offshore Wind and Wet Renewables (FLOWW) Group and continue to use the already appointed Fisheries Liaison Officer (FLO) during the construction period to minimise impacts on fisheries in this phase.

3.12.2. Potential Impacts

127. Impacts will be caused by the presence of vessels, machinery and safety/exclusion zones during construction and may affect fishing vessels operating in the vicinity of the Development Area or Offshore Export Cable Corridor. During operation and maintenance the impacts identified will be caused by the presence of turbines, infrastructure and fishing vessels. The impacts identified are described in Table 3-11 below.
128. It is not likely that the construction schedule of the Project will overlap in time or location with any other marine developments identified in the region. In addition the Project is small scale and construction will be phased.
129. Due to the distance to other existing and consented windfarms from the Project, the discrete nature of the safety/exclusion zones relative to the available fishing grounds during construction, and the construction schedule being phased, it is concluded that there will be no cumulative impacts associated with increased steaming time to fishing grounds.
130. Following the satisfactory completion of post-construction surveys fishing vessels will regain some degree of access to fishing grounds within the operational Development Area and all fishing should be able to resume within the Offshore Export Cable Corridor. The only area that will be off limits to all vessels will be the exclusion zone around the site.
131. The table below summarises the impacts which were considered during the assessment from the Project on commercial fisheries.
132. Cumulative impacts from the Development Area and the Offshore Export Cable combined on commercial fisheries during construction/installation and operation include:
- Temporary loss/restriction of access to fishing grounds;
 - Safety issues for fishing vessels (assessed in detail in Chapter 10); and

- Increased steaming time to fishing grounds.
133. The cumulative impacts from the Development Area and the Offshore Export Cable combined on commercial fisheries during operation are determined to be significant
134. Cumulative impacts from the Project combined with other Projects on commercial fisheries during construction/installation and operation include:
- Temporary loss/restriction of access to fishing grounds;
 - Safety issues for fishing vessels (assessed in detail in Chapter 10);
 - Increased steaming time to fishing grounds; and
 - Complete loss of fishing grounds.
135. The cumulative impacts from the Project combined with other Projects on commercial fisheries during operation are determined to be significant

Table 3-11 Identified residual impacts resulting from the Project on Commercial Fisheries (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area and Offshore Export Cable Corridor					
Adverse impacts on commercial and recreational fish and shellfish populations	X		X	Not significant	<ul style="list-style-type: none"> This is considered in full within Section 5.2, fish and shellfish ecology.
Temporary loss or restricted access to traditional fishing grounds	X		X	Not significant	<ul style="list-style-type: none"> The monetary value of landings from within the Development Area and the Offshore Export Cable Corridor are relatively low when taken into context the values of grounds around Scotland. In addition landings are relatively low when compared to local vessel landings into Aberdeen. The Development Area and the Offshore Export Cable Corridor are very small in relation to the available fishing grounds in the area. A Fisheries Liaison Officer (FLO) will be appointed for the Project in order to ensure that fishermen are informed in advance of installation plans, to answer queries raised by fishermen and ensure that fishermen can adjust their fishing activity (if needed). Loss will be temporary due to the short construction phase.
Complete loss or restricted access to traditional fishing grounds		X		Not significant	<ul style="list-style-type: none"> The monetary value of landings from within the Development Area and the Offshore Export Cable Corridor are relatively low when taken into context the values of grounds around Scotland. In addition landings are relatively low when compared to local vessel landings into Aberdeen. The Development Area and the Offshore Export Cable Corridor are very small in relation to the available fishing grounds in the area. A Fisheries Liaison Officer (FLO) will be appointed for the Project in order to ensure that fishermen are informed in advance of installation plans, to answer queries raised by fishermen and ensure that fishermen can adjust their fishing activity (if needed). Small scale and size of the Project means there will be only a limited area lost during operation. Complete loss of fishing grounds will only occur in the Development Area. The offshore export cables will be buried to 1.5m. Fishing vessels should be able to resume normal activities once the area is deemed safe.
Safety issues for fishing vessels from navigation and entanglement of gear	X	X	X	Not significant	<ul style="list-style-type: none"> Covered fully in Chapter 9 Maritime Navigation
Increased steaming time to fishing grounds	X	X	X	Not significant	<ul style="list-style-type: none"> Low numbers of vessels were recorded in the maritime navigation study, with the majority of vessels passing through the area rather than undertaking fishing activities.

Atkins Kincardine Offshore Windfarm

Non-Technical Summary

				<ul style="list-style-type: none">• Due to the size (500m) work exclusion zone in the Development Area, fishing vessels will not have to travel any considerable distance from normal routes.• Relative to the Development Area the exclusion zones, implemented during operation of the windfarm, are small which will require minimal deviation to steaming routes.• During operation increased steaming times will only be increased in the Development Area.
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3.13. Other Marine Uses

3.13.1. Existing Environmental Conditions

136. Other marine uses focuses on other human users and activities which are not covered by the other Chapters. Due to the Project's location and water depth there are a limited number of potential other human users that could be affected. The other users / activities considered include cables and pipelines, unexploded ordnance, scuba diving and other water sports.

3.13.1.1. Subsea Cables and Pipelines

137. There are no identified cables or pipelines within the Development Area or the Offshore Export Cable Corridor, and therefore there is no risk of interference with other users.

3.13.1.2. Unexploded Ordnance (UXO)

138. The possible UXO sources which may impact the Project have been identified within the assessment. The risks associated with these sources will require a detailed UXO site survey to ensure all risks are identified, located and appropriate action is taken.

3.13.1.3. Scuba Diving

139. Scuba diving is normally confined to the coastal areas of rocky shorelines, with most activity focused further to the south of the Development Area (Firth of Forth). Recreational diving is extremely limited in the area of the development due to the water depth (over 60m) which requires specialist dive equipment to reach the seabed. The only identified diving site within the Development Area is the SS Creemuir (Figure 3-1).

3.13.2. Potential Impacts

140. There is a potential health and safety risk for UXO associated with historic and current military activity to be encountered on the seabed in the Development Area and the Offshore Export Cable Corridor. During construction, activities which will have contact with the seabed, either directly (e.g. cable laying) or via the placement of material (e.g. anchors or cable protection), are at risk of disturbing UXO with potentially damaging and dangerous effects to operatives, equipment and Project infrastructure. Construction and O&M activities onsite could impact on dive trips to the identified site.

141. No cumulative impacts were identified due to the specific nature of the receptors and limited scale of the Project. However, the Eastern High Voltage Direct Current Subsea Link has a potential cable corridor that would cross the Offshore Export Cable Corridor if constructed and potentially have a cumulative impact the decommissioning phase of the Project if the Offshore Export Cables were removed.

142. The table below summarises the impacts which were considered during the assessment from the Project on other marine uses.

Table 3-12 Identified residual impacts resulting from the Project on Other Marine Users (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Development Area and Offshore Export Cable Corridor					
Impacts of cables and pipes				No Impact	<ul style="list-style-type: none"> There are no known cables or pipelines within the Development Area. There will be no impacts to other cables.
Impacts from UXO	X	X	X	Not significant	<ul style="list-style-type: none"> Survey will be undertaken prior to any intrusive works to confirm the presence and form of any known or potential UXO; Survey anomalies which indicate the presence of UXO will be avoided through micro-siting of all infrastructure works which could disturb UXO. Establishment of a formal quality assurance process with sign-off certification of the design process from a UXO specialist to reduce risks to As Low As Reasonably Practicable (ALARP); The scope and extent of further surveys to detect the presence of UXO in advance of major maintenance work will be considered in advance of scheduling and undertaking maintenance which has the potential to affect UXO; A UXO coordinator will be part of the vessel crew on relevant construction and maintenance vessels involved in activities where there is a risk of encountering previously unidentified UXO to ensure that all safety procedures and responses are adhered to during operations and in the event of UXO being encountered; and Crew on board all vessels involved in Project construction, maintenance and support during operations will be regularly briefed on munitions safety procedures and awareness. A UXO management procedure will be put in place to manage any unanticipated finds of suspected UXO. These measures will be delivered as part of the Project Environmental Management Plan for the Project.
Impacts on scuba diving	X	X	X	Not significant	<ul style="list-style-type: none"> Recreational diving is extremely limited in the Development Area due to the water depth (over 60m) which requires specialist dive equipment to reach the seabed. There is very limited diving on the SS Creemuir within the Development Area due to water depth, currents and distance from the shore.

3.14. Onshore

3.14.1. Existing Environmental Conditions

143. A connection to the electricity grid has been secured at Redmoss Substation, off Wellington Road, Aberdeen. Landfall of the cable will be located between the Export Cables and the jointing pits which will comprise a sunken concrete pit, located in the vicinity of Souter Head. In addition a small substation compound of approximately 30 x 40m may also be required. This would contain a small building and a transformer.

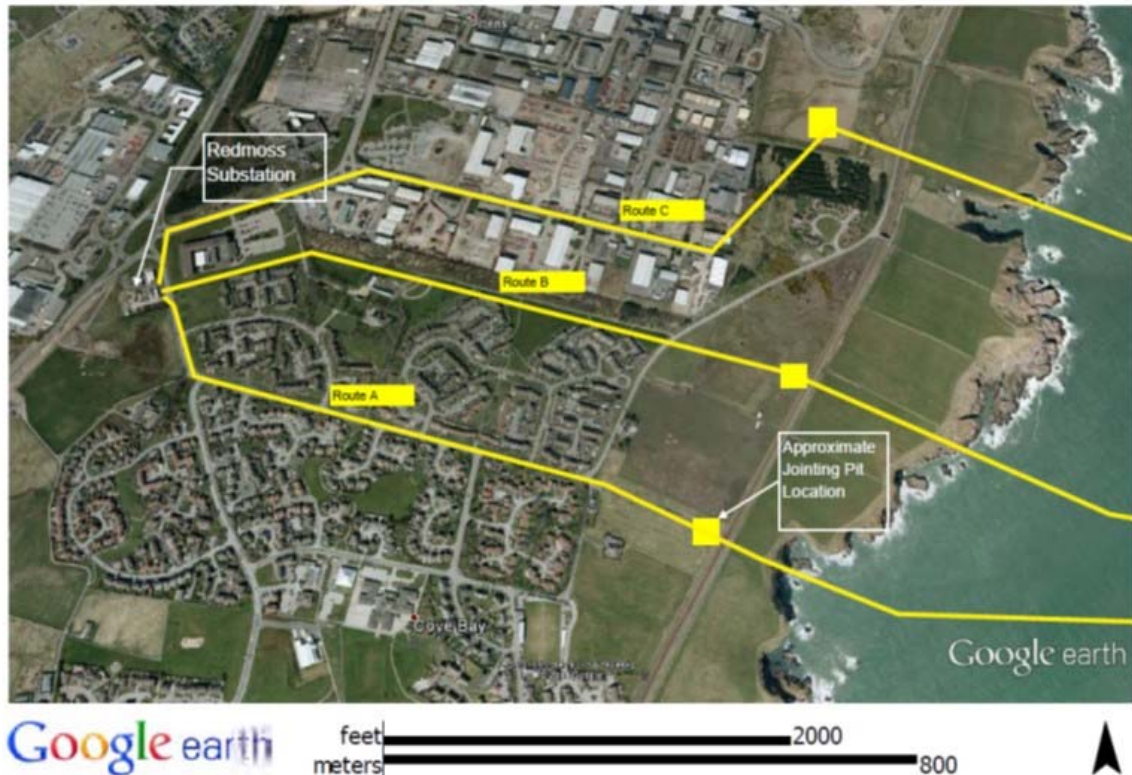


Figure 3-2 Alternative Cable Routes

144. Route A: The landfall would be located south of Burbanks Haven. The jointing pit would be located in an area of rough grazing to the west of the railway line. From the jointing pit the cable route would run west along Langdykes Road, with the cable being located in the carriageway.
145. Route B: The landfall would be located south of Burbanks Haven. The jointing pit would be located in an area of rough grazing to the west of the railway line. From the jointing pit the cable route would run west along a landscape buffer corridor between Altens employment area and housing located off Langdykes Road.
146. Route C: The landfall would be located north of Burbanks Haven. The jointing pit would be located in an area of rough grazing to the west of the railway line. From the jointing pit the cable route would run south through land in the ownership of the Aberdeen Harbour Board before turning west through the Altens employment area with the cable being located within the carriageway of Souter Head Road.

3.14.1.1. Ecology

147. A search was made for all statutory sites of nature conservation within 5km of the three options (see Table 3-13).

Table 3-13 Detail of statutory sites of nature conservation importance within 5km of each option

Site Number (Map Ref)	Reason for designation	Distance from project site boundary	Direction from project site boundary
River Dee Special Area of Conservation (SAC)	Primary reason for selection – fresh water pearl mussel, Atlantic salmon and otter.	Option A: 2.26km	North West
		Option B: 2.23km	
		Option C: 2.20km	
Cove SSSI	Notified features include vascular plants and coastlands.	Option A: 285m	South East
		Option B: 560m	
		Option C: 780m	
Findon Moor SSSI	Notified features include lowland heathland.	Option A: 3.8km	South
		Option B: 4.17km	
		Option C: 4.33km	
Nigg Bay SSSI	Glacial deposits	Option A: 2.6km	North East
		Option B: 2.8km	
		Option C: 3.0km	

148. The closest international designated site; Cove SSSI lies approximately 285m to the south east from Option A, 560m from Option B and 780m from Option C.

149. A search was made for all non-statutory sites of nature conservation within 1km of the three options.

Table 3-14 Detail of non-statutory sites of nature conservation importance within 1 km of each option

Site Number (Map Ref)	Distance from project site boundary	Direction from project site boundary
1 Coastline - Local Nature Conservation Site	Option A: Within	East
	Option B: Within	
	Option C: Within	
2 Kincorth Hill Local Nature Reserve	Option A: 885m	North West
	Option B: 870m	
	Option C: 785m	
3 Loriston Loch Local Nature Conservation Site	Option A: 660m	South West
	Option B: Over 1km	
	Option C: Over 1km	

150. The site enters the Coastline Local Nature Conservation Site which has a non-statutory designation. The local council biodiversity office should be contacted to discuss the project and agree protection measures prior to works going ahead. It is also recommended that a survey be undertaken prior to the works to check for specific ecological constraints at this location.
151. A small number of water bodies were found within 500m of the three options. The closest is a pond which lies within 100m of Option C and just over 250m from Option B. If these options are taken forward it is recommended that this water body and any other water bodies within 500m are surveyed to assess their suitability to support great crested newts. The other two water bodies, lie over 400m from the options and given the sites' limited suitability (open grassland and hardstanding) it is considered unlikely that newts would travel this distance to reach the site.
152. As each of the options passes through habitat such as open grassland and near to coastal / marine habitats it is recommended that a pre-construction ecological survey be undertaken to check for signs of or suitability for protected and notable species such as otter and badger.

3.14.1.2. Cultural Heritage

153. A search of a 1.6km radius from a central point within the study area was taken in order to identify all designated assets within proximity to the three proposed routes. Within this area, two scheduled monuments, twenty-three listed buildings, and one Conservation Area were identified.
154. The Pastmap database details a number of undesignated heritage assets including find spots, historic map sites, and wreck sites within the study area. Within the immediate proximity of the three proposed routes, only historic map sites are listed in the Canmore database. These relate to the historic landscape character of the area – essentially rural, with croft cottages, farmsteads, and higher status houses.
155. There are no areas of designated Ancient Woodland within the study area and no wetland sites.
156. No known archaeological sites or findspots exist along the proposed routes. Some findspots exist close by and are limited to isolated flint finds, except for the Scheduled Monument of Cat Cairn and the prehistoric remains found at Tullos Hill. Both sites lie considerably north of the proposed routes, on elevated ground.

3.14.1.3. Landscape

157. The Aberdeen City Landscape Strategy was adopted in 2002. The Strategy establishes the criteria by which landscape setting may be defined, and highlights the areas, landmarks and features which are most important to the landscape setting of the City and which should be safeguarded from general development.
158. The landfall and cable corridor comprise works which once operational will be underground. The landfall marker is a large feature, but there are unlikely to be any significant landscape and visual effects arising from the other elements.
159. There are no landscape designations within or adjacent to any of the cable corridor options.

3.14.1.4. Noise, Air Quality and Traffic

160. The activities which could give rise to potential noise, air quality and traffic impacts include Horizontal Directional Drilling (HDD), open trenching, the movement of materials to and from the working site and the movement of the workforce to and from the working site.
161. Dust emissions from construction activities are variable and will depend upon type and extent of the activity, soil conditions (soil type and moisture), road surface condition and weather conditions. Soils are inevitably drier during the summer period and periods of dry weather combined with higher than average winds have the potential to generate the most dust.

162. It is anticipated that the onshore works will have a duration of approximately three months. It is not known what time of year the works would take place.
163. Route Option A – The exact locations of the landfall and jointing pit area are still to be defined. However the closest residential property (East Lynn) is between 160m and 200m from potential location. There is a further residential property (Greenarbor) where the cable route meets the public highway at Langdykes Road. Langdykes Road is a local distributor road with residential development located on either side of it. The residential properties are set well back from the edge of the carriageway.
164. Route Option B - The exact locations of the landfall and jointing pit area are still to be defined. However there are no residential properties in close proximity to the landfall and jointing pit. The landscape buffer which the cable route would pass through is not open to vehicular traffic and the residential properties which are adjacent to it will not currently experience noise from road traffic. However the properties are closer to the industrial units in Altens Business Park many of which have open yards and they may be subject to noise from those uses.
165. Route Option C - The exact locations of the landfall and jointing pit area are still to be defined. The closest dwellings (at Burnbanks Village) are over 200m from the indicative jointing pit location. The indicative jointing pit location is sited within an employment area. The cable route from the jointing pit passes through an area of scrubland before joining the alignment of Option B through the landscape buffer.

3.14.2. Potential Impacts

3.14.2.1. Ecology

166. The closest European designated site lies over 2.2km from each of the three options and is not aquatically linked to any of the proposed sites. The River Dee SAC is designated for presence of fresh water pearl mussel, Atlantic salmon and otter. Given the lack of aquatic connections to the site any impact on these species as a result of the works is considered highly unlikely and no further assessment is recommended.

3.14.2.2. Cultural Heritage

167. Potential impacts of the scheme would be limited to direct disturbance of unknown archaeological remains across the three proposed routes.

3.14.2.3. Landscape

168. With the exception of the permanent landfall marker potential effects arising from the cable corridor and landfall will be from construction and decommissioning only. Landscape and visual effects arising during the construction and decommissioning period are likely to be of limited scale and duration. Once installed and the land reinstated there will be no visual impact from the presence of the cable within the cable corridor.

3.14.2.4. Noise, Air Quality and Traffic

169. It is considered that once the Onshore Works are operational, there is very limited potential for the development to affect local air quality or noise environment. If appropriate mitigation measures are adopted the construction phase is unlikely to give rise to significant impacts. All of the options would need appropriate traffic management to be in place during the installation phase.
170. The proposed impacts are detailed in Table 3-15 below.

Table 3-15 Identified residual impacts onshore resulting from the Project (C= Construction, O=Operation and D=Decommissioning)

Impact	C	O	D	Impact Significance	Discussion
Onshore and cable landfall					
Ecology	X		X	Not significant	<ul style="list-style-type: none"> The onshore work is considered to be far enough away from Cove SSSI to avoid direct impact on the designating features. However, due to the proximity of the shore line to the works and the connectivity along the coastline protection measures are recommended. The second SSSI lies over 3km away from each option and it is considered even with the aquatic connection at the coastline that the on shore works will not impact on this site and therefore no further mitigation is considered necessary. The local council biodiversity office should be contacted to discuss the project and agree protection measures prior to works going ahead in the Coastline Local Nature Conservation Site. Given the distance from the other non-statutory sites identified it is not considered that the works will impact on these sites and no further recommendations are made. A survey also be undertaken prior to the works to check for specific ecological constraints at this location.
Cultural Heritage	X		X	Not significant	<ul style="list-style-type: none"> None of the routes will directly impact known archaeological sites, listed buildings, or other designated heritage assets. The western section of all routes (trenched) could potentially impact post-medieval buried archaeology associated with the historic settlements of the area. However, as they follow existing tarmacked routes, it is likely that any archaeological remains have been disturbed or truncated. Route B has least impact on existing known heritage constraints (Conservation Area, listed buildings, historic settlement), and based on these determinants is considered the preferred route.
Landscape	X		X	Not significant	<ul style="list-style-type: none"> Landscape and visual effects arising during the construction and decommissioning period are likely to be of limited scale and duration. Once installed and the land reinstated there will be no visual impact from the presence of the cable within the cable corridor.
Noise	X		X	Not significant	<ul style="list-style-type: none"> Provide an induction to site personnel addressing their responsibilities with regard to noise and vibration management; Plan hours of working, taking into account the nature of land use in the areas concerned and duration of the work; Provide an out-of-hours works procedure to minimise the effect of any necessary works outside daytime working hours;

					<ul style="list-style-type: none"> Notify potentially affected residents of construction activities likely to affect amenity due to noise or vibration in advance.
Air Quality	X		X	Not significant	<ul style="list-style-type: none"> <u>Site Planning</u> Machinery and dust causing activities will be located away from sensitive receptors where possible; Tips and stockpiles will be located away and down-wind from neighbours where possible; All personnel will be to be fully trained; A trained and responsible manager will be on site during working times to maintain the required logbook and carry out site inspections; Hard surface/compact site haul routes will be used, where practical. <u>Construction Traffic</u> All vehicles will switch off engines when not required and no idling vehicles will be permitted; Effective vehicle cleaning will be implemented in addition to specific fixed wheel washing on leaving site and the damping down of haul routes; All loads entering and leaving site will be covered; No site runoff of water or mud will be permitted; Dusty surfaces will be swept regularly; on-road vehicles will comply with set emission standards; low speed limits will be observed on site; The movement of construction traffic around site will be minimised. <u>Site Activities</u> Dust generating activities will be minimised; A dust removal system will be provided for plant; The drop height of falling material will be limited; Water will be used as a dust suppressant where applicable; Stockpiles will be covered, seeded or fenced to prevent wind whipping; Activities/operations will be temporarily suspended if the creation of dust cannot be avoided or becomes excessive (complaints from locals).

4. Environmental Management

171. The potential effects of the Project have been assessed through the EIA processes and the results of the impact assessment are presented in the ES. These processes have indicated that it is necessary to manage certain aspects of the Project to ensure potential impacts are not significant. Some key mitigation measures that have been identified include:
- a. Standard industry practice with regards to the management and mitigation of shipping and navigation activities will be followed in addition to project specific mitigation. The details of this mitigation will be agreed as part of ongoing consultation with the Maritime and Coastguard Agency. This includes consideration of either compulsory or advisory safety zones and/or fishing prohibition.
 - b. KOWL will retain the already appointed Fisheries Liaison Officer (FLO) for the construction phase of the Project and will follow the Fishing Liaison with Offshore Wind and Wet Renewables Groups (FLOWW) best practice guidance for offshore renewables developments with regards to liaison with the fishing community.
 - c. Agreements will be put in place with other sea users (such as asset owners e.g. Scottish Water and Aberdeen City Council) to ensure no unacceptable impacts arise during installation of the Project.
 - d. Emergency plans developed for the Project will include measures to reduce the risk or impacts from any accidental fuel, oil or other hydrocarbon or chemical spills.
172. Environmental assessment will continue beyond submission of the ES. A full Environmental Monitoring Plan (EMP) will ensure that ES mitigation commitments, consent conditions and environmental monitoring requirements are taken through to implementation.
173. The EMP will highlight the various parties who are responsible for the implementation of the EMP and will identify a number of mechanisms to deliver environmental management measures. The EMP will be implemented in agreement with the Regulators and statutory advisors following successful award of Project consents. Mitigation measures will be monitored to enable KOWL to track and assess the performance of the EMP to ensure improvements are made if necessary.