



**DOGGER BANK
TEESSIDE A & B**




**March
2014**


Environmental Statement Chapter 35 Summary of Mitigation and Monitoring

Application Reference: 6.35

Cover photograph: Installation of turbine foundations in the North Sea

Document Title Dogger Bank Teesside A & B
 Environmental Statement – Chapter 35
 Summary of Mitigation and Monitoring
 Forewind Document Reference F-OFC-CH-035 Issue 4.1
 Date March 2014

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Date / initials approval		05 March 2014
Forewind Approval		
Date / Reference approval	Gareth Lewis	14 March 2014

Title: Dogger Bank Teesside A & B Draft Environmental Statement Chapter 35 - Summary of Mitigation and Monitoring		Contract No. (if applicable) Onshore <input type="checkbox"/> Offshore <input checked="" type="checkbox"/>
Document Number: F-OFC-CH-035	Issue No: 4.1	Issue Date: 17 March 2014
Status: Issued for 1st. Technical Review <input type="checkbox"/> Issued for PEI3 <input type="checkbox"/> Issued for 2nd. Technical Review <input type="checkbox"/> Issued for DCO <input checked="" type="checkbox"/>		
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Revision History

Date	Issue No.	Remarks / Reason for Issue	Author	Checked	Approved
23 September 2013	1	Issued for 1st Review	AL/RH	AH	AMP
03 Octobre 2013	2	Issued for 2 nd Review	AL/RH	AH	AMP
14 October 2013	3	Issued for PEI3	AL/ RH	AH	AMP
06 March 2014	4	Pre DCO submission review	AL/RH	AH	AL
17 March 2014	4.1	DCO submission	AL/RH	AH	AL

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Appendix 24C Site Waste Management Plan

1. Introduction

1.1. Introduction

- 1.1.1. This chapter of the Environmental Statement (ES) provides an overview of the proposed mitigation and monitoring identified for Dogger Bank Teesside A & B throughout the project life cycle (construction, operation and decommissioning). There are two principle means in which environmental impacts have been reduced or avoided through the development and implementation of mitigation measures throughout the development of Dogger Bank Teesside A & B. The first step in mitigating potential adverse impacts has been achieved through an iterative process of project design, including for example: site selection, cable routing, design of foundations and cable systems, timing of works, and consideration of alternative construction methods. A summary of these ‘mitigations by design’ or ‘embedded’ mitigations is provided in **Table 2.1**.
- 1.1.2. Where potential adverse impacts could not be wholly avoided or reduced through design changes any remaining impacts have been avoided or reduced, where practicable, through the implementation of additional mitigation measures during the construction, operation and decommissioning phases of the project. These additional mitigation measures have been detailed within each relevant technical chapter of this ES and are summarised in **Table 2.2 – Table 2.4**.
- 1.1.3. The design mitigation measures (**Table 2.1**) are already embedded within the project description. The remaining mitigation measures (**Table 2.2 – Table 2.4**) are in many cases in outline only, and will be agreed and finalised in conjunction with the Regulatory Authorities and relevant stakeholders as part of the on-going consultation and consenting process. Forewind has worked closely with the relevant authorities and followed best practice and relevant guidance to ensure the mitigation measures put forward in this ES are practical both in terms of implementation and effectiveness in reducing potential adverse impacts.
- 1.1.4. Prior to construction, Forewind will produce an Environmental Management and Monitoring Plan (EMMP) within which the final detailed mitigation methodologies and construction timetables will be outlined. The content of the EMMP will be derived from the final ES, draft conditions and/or requirements set out in the Development Consent Order (DCO), post-consent consultations and pre-construction surveys. The final form and scope of the EMMP will be agreed with the relevant authorities following consent and prior to construction.

2. Documentation and Implementation

2.1. Introduction

- 2.1.1. It is expected that the mitigation and monitoring measures put forward as part of the Environmental Impact Assessment (EIA) and summarised in this ES chapter will form part of the eventual consent and licence conditions, many of which will require environmental monitoring and mitigation plans to be produced as part of the overarching EMMP.
- 2.1.2. The EMMP will be the principle vehicle through which mitigation measures are implemented to ensure that appropriate actions are taken to prevent, reduce and offset potential impacts which have been described in the ES or identified through subsequent consultation and monitoring.

2.2. Offshore

- 2.2.1. Prior to any licensed activities commencing offshore, a number of documents must be submitted to the Marine Management Organisation (MMO), and consulted on with any other relevant statutory bodies, for approval.
- 2.2.2. The draft deemed Marine Licence (Conditions 11 and 12) details all of the pre-construction plans that are required to be submitted four months prior to the planned commencement of offshore construction. These include:
- Plans detailing all infrastructure dimensions and locations;
 - Construction and Monitoring Programme (includes start date, mobilisations, work phases, monitoring strategies etc.);
 - Construction Method Statement (detailing methods e.g. drilling, installation outlined in the ES for cables, foundations and scour protection, contractors and vessels);
 - EMMP (details the Marine Pollution Contingency Plan, Chemical Risk Assessment, Waste Management Plan, Fisheries Liaison provision);
 - Marine Mammal Mitigation Protocol;
 - Cable Installation Plan (including technical specifications, desk assessment on electromagnetic fields (EMF), cable laying plan and risk assessment, details of scour and cable armouring); and
 - Archaeological Written Scheme of Investigation (WSI) (detailing methodologies for any further site investigations, mitigation, protocols for reporting and recording data and finds).
- 2.2.3. Condition 15 relates to requirements for the pre-construction (baseline) monitoring of the following where appropriate and necessary, for each of these four areas a survey is required:
- Benthic habitats;

- Bathymetry and side-scan survey;
- Ornithological activity; and
- Fish species.

2.2.4. Requirements for construction monitoring are detailed under Condition 16 and primarily relate to monitoring of underwater noise associated with driven or part driven pile installation, and reporting to the MMO within a specified timeframe.

2.2.5. Post-construction monitoring requires the same four areas to be assessed to enable comparison with pre-construction data; detailed provisions for undertaking these requirements must be approved by the MMO four months prior to the commencement of these surveys.

2.3. Onshore

2.3.1. Prior to the commencement of the onshore works, a written scheme setting out all the stages of onshore works must be submitted to, and approved by, the relevant Planning Authority. In addition, there are a range of other requirements detailed in the Draft DCO Part 3 (Conditions 21- 39) which include approvals post-consent for:

- Detailed design (including layout, scale, levels, appearance, dimensions);
- Provision of landscaping (including all soft and hard landscaping for each phase of works);
- Implementation and maintenance of landscaping (all to be undertaken in adherence with best practice and industry standards);
- Details of all temporary and permanent fencing proposed;
- Highway access (including details of all layouts, access points, routes);
- Drainage systems for surface and foul water;
- Archaeological WSI (sets out pre-construction evaluation, programme and methodology for site investigation and recording);
- Ecological Management Plan (links with survey results, mitigation and enhancement from the final ES);
- Code of Construction Practice (CoCP) and Construction Environment Management Plan (management of noise and vibration, air quality, waste management (Site Waste Management Plan), water management); and
- Construction Traffic Management Plan.

2.4. Summary of measures included in the Environmental Statement

2.4.1. As described above, **Table 2.1 – Table 2.4** summarise the proposed mitigation and monitoring identified for Dogger Bank Teesside A & B throughout the project life cycle (construction, operation and decommissioning).

Table 2.1 Summary of measures in the design phase

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Design phase – embedded mitigation		
Chapter 8 Designated Sites	N/A	Mitigation and monitoring measures relevant to designated sites are covered under each relevant topic, namely Marine and Coastal Ornithology, Marine Mammals, Marine and Intertidal Ecology, Fish and Shellfish Ecology and Terrestrial Ecology.
Chapter 9 Marine Physical Processes	Potential for short term, localised increase in turbidity due to intertidal works	Horizontal Directional Drilling (HDD) techniques may be used for intertidal works, if deemed to be viable, these can reduce sediment releases into the environment. No cable protection shall be used in the 350m zone from MLWS.
Chapter 11 Marine and Coastal Ornithology	Collision risk to birds	In order to mitigate the impact associated with collision risk, the design envelope was modified to include: <ul style="list-style-type: none"> • A maximum number of 200 turbines per project (i.e. reduced by 33% from 300); and • An associated increase in the minimum lower blade tip height (from 22m to 26m) above highest astronomical tide.
Chapter 12 Marine and Intertidal Ecology	Habitat loss or degradation	The pre-construction survey (<12 months before construction) will be designed to determine the presence/absence of any Annex I reef habitat in the main sites and/or export cable corridors. Following the pre-construction survey, micro-siting protocols will be used in order to avoid adverse effects on sensitive habitats and biogenic reefs from construction activity (in consultation with the MMO and key stakeholders). Cable burial to sufficient depths, where possible, to allow the seabed to recover to its natural state. Use of HDD, if practicable, to reduce impacts on intertidal habitats.
Chapter 13 Fish and Shellfish Ecology	Introduction of an anthropogenic source of electromagnetic fields (EMF) within the marine environment	The following measures will reduce EMF emissions: <ul style="list-style-type: none"> • Armouring subsea cables; • Burying subsea cables (where feasible, as outlined in Chapter 5 Project Description); and • Where burial is not feasible other options e.g. concrete mattresses, rock burial and/or pipes may be considered.
	Sandeel habitat loss/displacement due to	The project boundaries are not adjacent to habitats containing high densities of sandeels, thus removing the possibility of direct impacts and substantially reducing the extent of any

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Design phase – embedded mitigation		
	project boundaries	indirect effects from sediment deposition.
	Noise impacts	Flexibility has been incorporated into the design envelope in order to accommodate the possibility of 24 hour working practices. If applied, this would reduce the length of exposure to noisy activities (namely pile driving) and any subsequent impacts.
Chapter 14 Marine Mammals	Underwater noise impacts on marine mammals	<p>Soft start piling procedures will be implemented as part of the Marine Mammal Mitigation Protocol (MMMP) in accordance with the Statutory Nature Conservation Agency Protocol for minimising the risk of injury to marine mammals from piling noise (Joint Nature Conservation Committee (JNCC), 2010).</p> <p>As above, flexibility has been incorporated into the design envelope in order to accommodate the possibility of 24 hour working practices. If applied, this would reduce the length of exposure to noisy activities (namely pile driving) and any subsequent impacts.</p>
Chapter 15 Commercial Fisheries	Risk of collision with work vessels/ installed infrastructure/ gear fastening risks	<p>Fisheries consultations revealed curved array layouts to be undesirable which contributed to the decision to remove curved array layouts as an option for Dogger Bank Teesside A & B.</p> <p>Infrastructure partially or completely installed will be marked and appropriately lit. This will reduce collision risk.</p> <p>Over-trawlable cable protection designs to be considered where reasonably practicable.</p> <p>On-going consultation via Fisheries Working Groups and targeted discussions with seine netters regarding mitigation options.</p>
Chapter 16 Shipping and Navigation	Risk of unsafe passage within and adjacent to the wind farm site	<p>The markings for Dogger Bank Teesside A & B will be agreed in consultation with Trinity House once the final turbine layout has been selected.</p> <p>Site layout rules restrict the potential turbine array patterns used. Further modification of the rules in response to consultation removed curved array layouts as an option for Dogger Bank Teesside A & B, reducing navigation risk and to assist Search and Rescue (SAR). However the option for dense curved perimeters still remains.</p>
Chapter 17 Other Marine Users	Damage to subsea cables	Any subsea cables which cross Dogger Bank Teesside A & B will be the subject of crossing and proximity agreements which have been discussed with the operators during the planning stages.

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Design phase – embedded mitigation		
	Damage oil and gas pipelines	Any pipelines which cross Dogger Bank Teesside A & B have been the subject of crossing and proximity agreements discussed during the planning stages. Positioning of boundaries to avoid major pipelines and agreements on separation distances.
	Disruption to carbon capture and storage due to overlap of construction activities	Forewind is in discussion with the operator to resolve any issues e.g. separation distances, between CO ₂ pipeline and high voltage direct current (HVDC) export cables.
	Carbon capture and storage, overlap in structures at landfall	Discussions with the operator on location of structures to avoid overlap.
	Disruption to oil and gas activity e.g. shipping transit routes	Consultation and advance notification of activities.
Chapter 18 Marine and Coastal Archaeology	N/A	There are no embedded mitigation measures specifically developed with regard to potential marine and coastal archaeology impacts.
Chapter 19 Military Activities & Civil Aviation	N/A	There are no embedded mitigation measures specifically developed with regard to military activities and civil aviation.
Chapter 20 Seascape and Visual Character	N/A	There are no embedded mitigation measures specifically developed with regard to potential seascape impacts included.
Chapter 21 Landscape and Visual Character	Landscape and visual impacts of the onshore HVDC / high voltage alternating current (HVAC) cable route	<p>A high level design decision by Forewind to seek consent for buried cables for both the HVDC and HVAC sections of the cable route, rather than overhead lines which will considerably reduce the potential for landscape and visual impacts.</p> <p>Single cable route containing two co-located cable systems to reduce landscape and visual impacts and other environmental impacts.</p> <p>HDD method of crossing is proposed at a number of locations along the cable route for example roads e.g. A174 and railways to avoid affecting surface features.</p> <p>Early cable routing to provide an increased buffer between the cable route and sensitive landscape features such as groups of trees. Where locations were identified where the</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Design phase – embedded mitigation		
		<p>cable route intercepted sensitive landscape features such as trees and woodlands, the route was adjusted to avoid these locations where possible.</p> <p>Avoidance of most sensitive landscape and visual features, such as woodland, scrub and water courses, by crossing through intensive agricultural land.</p>
	Landscape and visual impacts at the landfall	HDD technique at the landfall and to bury the joint transition bays in order to reduce the potential for landscape and visual impacts as very limited above ground infrastructure will be present post-construction phase.
	Landscape impacts of converter stations	<p>Avoidance of sensitive and designated landscapes where possible.</p> <p>Co-location of the two converter stations on the same site to reduce the landscape and visual impacts associated with two separate locations which could potentially have more extensive impacts.</p> <p>Converter stations and associated infrastructure with the converter stations were sought to take advantage of the screening provided by land form and existing features such as trees, and to seek to use the potential of a site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.</p> <p>Permanent lighting will be designed to minimise glare and light spillage off-site, to the sky and to adjacent areas (particularly residential properties close to the site).</p> <p>The height of the converter stations was reduced as much as practicably possible (from 30m to 20m) in order to reduce the potential for visual impacts.</p> <p>Locating the converter stations within agricultural land to the north of the A174 makes use of existing screening afforded by bunds, woodland planting, hedgerows along the A174 to the south, in order to reduce visual impacts from Wilton and the A174 to the south and east, from Lazenby to the southwest and from Lackenby and Eston to the west.</p>
Chapter 22 Socio-economics	N/A	There are no embedded mitigation measures specifically developed with regard to potential socio-economic impacts.
Chapter 23 Tourism and Recreation	Disruption to tourist and recreation features during	Initial routing of the cable to avoid known local tourist and recreation features such as the Redcar Rugby Union Football Club and the Teesside Athletic Football Club grounds.

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Design phase – embedded mitigation		
	cable installation	
Chapter 24 Geology, Water Resources and Land Quality	Location of converter stations	<p>Co-locating the converter stations away from areas of flood risk.</p> <p>Co-locating the converter stations away from areas of landfilling.</p>
	Impact of onshore works on land quality and water quality	<p>Locating HVDC cable route outside the landfill sites at perimeter mounds.</p> <p>HDD drilling beneath historic landfills in the east of the project area near the landfall, railway and Redcar Road.</p>
	Impact of onshore works on groundwater / surface water quality	Co-locating the converter stations away from areas of flood risk.
	Gas risk	<p>All buildings / foundations with confined spaces should be designed and built with gas venting / protection measures as a precautionary measure, in-line with current building regulations where applicable.</p> <p>Gas risks will be considered for all maintenance workers whenever there is a requirement to enter confined spaces. This should be managed through health and safety risk assessments.</p>
Chapter 25 Terrestrial Ecology	Potential impact on ecological features	<p>The routing of the cable deliberately avoided statutory designated sites and any woodlands or ponds visible on Ordnance Survey mapping.</p> <p>Emerging survey findings have fed into ongoing design work. In a number of instances minor route shifts have been made on ecological grounds.</p> <p>Forewind's ecologists and landscape architects have liaised in order to ensure an integrated design approach to the landscaping of the permanent converter stations site.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Design phase – embedded mitigation		
Chapter 26 Land Use and Agriculture	Potential impacts on land use and agriculture	<p>Development footprint minimised to smallest technically feasible area.</p> <p>Siting of development within agricultural land as opposed to other land uses.</p> <p>Minimisation of areas of land that will become isolated or inaccessible during construction by following existing field boundaries.</p> <p>Burial of cables at a depth to allow current land uses to continue.</p> <p>HDD will be utilised at road and railway crossings to maintain access.</p> <p>Underground inspection pits located at field boundaries to avoid restricting current land use practices.</p>
Chapter 27 Onshore Cultural Heritage	Impact on cultural heritage features due to onshore construction	<p>Co-location of the converter stations at the same site, located within an existing industrial setting in order to minimise impacts to key views and the setting of heritage assets.</p> <p>Burying the cable systems rather than have overhead lines in order to avoid impacts to the setting of heritage assets.</p> <p>Avoidance of designated and non-designated heritage assets during the design of the HVDC and HVAC routes.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Design phase – embedded mitigation		
Chapter 28 Traffic and Access	Impacts of onshore construction on local transport links	<p>The following embedded mitigation measures are promoted within the ‘Traffic and Access Strategy’:</p> <ul style="list-style-type: none"> • Access to the development primarily from A or B roads, thereby minimising the impacts upon local communities and utilising the most suitable roads; • Access routes located close to the main A and B roads to reduce the impact upon local communities; • The use of a remote haul route to reduce trips upon the highway network to distribute materials as well as reducing the number of points of access on to the highway network; • The use of a haul route from the Wilton Complex under the A1053 (via an underpass) to the existing NGET substation at Lackenby to reduce traffic movements upon the B1380 where possible; • Primary compounds and the converter stations site are located away from sensitive receptors to reduce the traffic impact upon local communities; • The use of HDD for all (public highway) road and rail crossings to reduce the disruption to traffic from more conventional cut and cover techniques; • The linear nature of the project will allow for the even distribution of activities and associated daily HGV demand; and • The implementation of car-sharing amongst construction staff at a minimum ratio of 2.5 employees to a vehicle to reduce light commercial vehicle (LCV) traffic.
Chapter 29 Noise	Potential noise impacts on local population due to onshore construction	Converter stations site and cable route located away from residential areas where practicable.
Chapter 30 Air Quality	General air quality and pollution risks posed by onshore works	Converter stations site and cable route located away from sensitive receptor locations as far as possible.

Table 2.2 Summary of measures in the construction phase

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
Chapter 8 Designated Sites	N/A	Mitigation and monitoring measures relevant to designated sites are covered under each relevant topic, namely Marine and Coastal Ornithology, Marine Mammals, Marine and Intertidal Ecology, Fish and Shellfish Ecology and Terrestrial Ecology.
Chapter 9 Marine Physical Processes	Potential for short term, localised increase in turbidity due to intertidal works	No further measures beyond those identified as embedded mitigation.
Chapter 10 Marine Water & Sediment Quality	Discharge of controlled and/or dangerous chemicals into the marine environment	Implementation of the measures contained within the Environmental Management and Monitoring Plan, which will include a Marine Pollution Contingency Plan, Chemical Risk Assessment & Waste Management Plan.
Chapter 11 Marine and Coastal Ornithology	Bird disruption/collision risk during offshore and intertidal works	<p>Construction vessels will avoid areas of rafting seabirds during sensitive periods where practical.</p> <p>Aviation and navigation lighting will be minimised during construction to avoid the attraction of birds, where practicable, while acknowledging construction safety.</p> <p>Monitoring to establish whether numbers of marine birds change within the project areas during and after construction. As significant numbers of different species are present in the Dogger Bank Zone across the year, surveys may be carried out on a monthly basis. Exact scope to be agreed with key stakeholders prior to construction.</p>
Chapter 12 Marine and Intertidal Ecology	Habitat loss or degradation	Pre-construction (baseline) monitoring of benthic habitats, including bathymetry and side-scan survey, to identify potential Annex I reef habitat, exact scope to be agreed with the MMO and key stakeholders prior to construction.
Chapter 13 Fish and Shellfish Ecology	Underwater noise	Refer to embedded measures described under the design phase (above). Additionally soft start piling procedures will also enable marine organisms to flee before full piling force is reached.
	Habitat loss or disturbance	Pre and post construction survey of fish species. Exact scope to be agreed with the MMO and key stakeholders prior to construction.
Chapter 14 Marine Mammals	Auditory Injury (Temporary Threshold Shift (TTS)/ Permanent Threshold Shift (PTS)) in European Protected Species due to	<p>Soft start piling procedures will be implemented as part of the MMMP in accordance with the Statutory Nature Conservation Agency Protocol for minimising the risk of injury to marine mammals from piling noise (JNCC 2010).</p> <p>An exclusion zone will also be developed as part of the MMMP following JNCC 2010</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
	piling	<p>Protocols. The radius of the MMMP exclusion zone may be extended beyond 500m to encompass the maximum range of instantaneous PTS of all species.</p> <p>Forewind will consider using any proven alternative noise reduction measures that may be available at time of construction.</p>
Chapter 15 Commercial Fisheries	Risk of collision with construction and Operation and Maintenance (O&M) vessels and installed infrastructure	<p>500m 'rolling' safety zones around all major construction and maintenance vessel activities.</p> <p>Locations of safety zones clearly communicated via Notices to Mariners, appropriate media and Fisheries Liaison Officer (FLO).</p> <p>All partially and fully installed infrastructure to be marked and appropriately lit at all times.</p> <p>All work vessels to use agreed transit routes and comply with International Regulations for Preventing Collisions at Sea (COLREGS).</p> <p>FLO to assist in identifying prescribed construction vessel transit routes to avoid concentrations of static gears.</p> <p>Fisheries liaison arrangements will inform fishermen of proposals e.g. construction schedules, associated proposed safety zones, installed infrastructure and best work vessel access and transit routes. This will reduce disturbance of fishing activity.</p>
Chapter 16 Shipping and Navigation	Risk of collision with construction and O&M vessels and installed infrastructure	<p>A Search and Rescue Emergency Response Co-operation Plan (SAR ERCoP) through discussion with the Maritime and Coastguard Agency (MCA) Search and Rescue and Navigation Safety Branches.</p> <p>Aids to Navigation (AtoN) will be provided in accordance with Trinity House requirements.</p> <p>Working areas demarcated in accordance with the International Association of Lighthouse Authorities (IALA) Maritime Buoyage System and possibly Trinity House temporary marking Notices to Mariners, Radio Navigational Warnings, Navigational Telex (NAVTEX) and/or broadcast warnings as well as Notices to Airmen will be promulgated in advance of any proposed works.</p> <p>Any Significant Peripheral Structure (SPS) to be fitted with lights visible from all directions in the horizontal plane.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>Marine vessel co-ordinator to co-ordinate and oversee all vessel movements.</p> <p>500m 'rolling' safety zones around each turbine being worked on to minimise disruption to mariners and other users of the sea.</p>
Chapter 17 Other Marine Users	Risk of emergency/ pollution incident	On-site vessels and crew trained and capable of undertaking initial response to emergencies and pollution incidents.
Chapter 18 Marine and Coastal Archaeology	Interference with subsea cables, pipelines or carbon capture and storage during construction	Activities to be undertaken in accordance with crossing and proximity agreements.
Chapter 19 Military Activities and Civil Aviation	Damage or destruction of archaeological deposits and material and their physical setting from direct or indirect impacts	<p>A Written Scheme of Investigation (WSI) has been produced, for Dogger Bank Teesside A & B.</p> <p>Landfall construction activities to be planned to avoid archaeological receptors. Any unexpected discoveries will be reported and addressed through the application of the Offshore Renewables Protocol for Archaeological Discoveries (ORPAD).</p> <p>Use of Archaeological Exclusion Zones (AEZs) and micrositing.</p> <p>Monitoring of scour and changes to physical processes as set out in WSI.</p>
	Impact upon aeronautical SAR operations	<p>Inclusion of wind farm on aeronautical charts, position of individual wind turbines plotted for use in GPS/radar datasets.</p> <p>Lighting of wind farm/wind turbines in accordance with requirements of Civil Aviation Authority (CAA), MoD and marine regulators.</p> <p>Marking of wind turbines and blades in accordance with requirements to ensure they are as conspicuous as possible.</p> <p>Ensuring that the wind turbines have a radar 'signature' sufficient to satisfy needs of stakeholders whose helicopters may need to traverse the site in poor visibility.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
Chapter 20 Seascape and Visual	Visual impact on seascape	In the absence of any land based receptors to be visually impacted by the development, and the over-riding need for it to be conspicuous to shipping, no additional mitigation is proposed during construction.
Chapter 21 Landscape and Visual	<p>Impacts on landscape character and resources at the landfall and HVDC Cable Route</p> <p>Visual impacts on residential, recreational and travelling receptors present at the landfall and HVDC Cable Route</p>	<p>Construction will follow an agreed Construction Environmental Management Plan (CEMP). General mitigation measures and generic best practice working will be employed including:</p> <ul style="list-style-type: none"> • The retention and protection of identified trees, shrubs and hedges that are considered to be significant in accordance with British Standards Institute (2005): BS 5837:2012 Trees in Relation to Construction; • Employing best practice soil handling procedures, including DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites- Recommendations; • The conduction of works during daylight hours where possible, and use of construction lighting designed to not impinge into sensitive views, such as close views from bedroom windows of residential properties; • Appropriate hedge species will be replanted along the line of the existing hedge, and managed so as to restore the existing hedgerow where removal of sections of hedgerows are unavoidable; • The progressive restoration of finished areas where appropriate, and so that stored topsoil can be replaced on graded areas when finished; • The creation of naturalistic and sympathetically designed landscape profiles once the works are complete; and • The replacing of topsoil, regrading, cultivation and seeding of areas of disturbed earth to blend with the surrounding land form post construction.
	<p>Landscape and resources within the vicinity of the converter stations</p> <p>Visual impacts on residential, recreational and travelling receptors present within the vicinity of the converter stations</p>	<p>General mitigation measures will be implemented as follows:</p> <ul style="list-style-type: none"> • Temporary hoarding will be erected around the site prior to construction; • Works will be conducted during daylight hours where possible and under normal circumstances, under normal circumstances no task lighting will be required during construction; • Naturalistic and sympathetically designed bund profiles will be created and native woodland vegetation planting on the top of the bunds, to tie in with woodland planting on the existing bunds; and • All areas of disturbed earth will be cultivated and seeded with appropriate grasses and wild flora and planted with an appropriate mix of native tree species (to be agreed with RCBC).

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		A restoration plan will form part of the CEMP described above.
	Impacts on landscape character and resources within the vicinity of the HVAC Cable Route and the existing NGET substation at Lackenby	Embedded mitigation and generic best practice measures as for the HVDC cable route above.
	Visual impacts on residential, recreational and travelling receptors present within the vicinity of the HVAC Cable Route and existing NGET substation at Lackenby	Embedded mitigation and generic best practice measures as for the HVDC cable route above.

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
Chapter 22 Socio-economics	N/A	There are no mitigation measures specifically developed with regard to potential socio-economic impacts included within the proposals.
Chapter 23 Tourism and Recreation	Potential impacts to National Cycle Network 1 and proposed England Coast Path	<p>Prior to commencement of works in this locality (approximately 3 months), consultation with local community and relevant stakeholders to inform them of the timing of the works;</p> <p>No storage of equipment, materials or machinery close to either the National Cycle Network Route 1 and proposed England Coast Path.</p> <p>Minimisation of working area wherever possible.</p>
	Potential impacts in relation to pathways (PRoW) and Eston Hills	<p>Liaison with the PRoW Officer to develop a PRoW strategy, including identifying suitable temporary diversion routes and/or plan appropriate temporary closures / crossing control.</p> <p>Good communication with local community to inform of any PRoW temporary diversions and closures, to avoid inconvenience.</p> <p>Minimise duration of closures wherever practicable, with consideration to public safety at all times.</p> <p>Reinstatement of all features immediately following construction phase.</p>
	Potential impacts to museums & other attractions	<p>Liaison with the Winkies Castle, Kirkleatham Museum and Kirkleatham Owl Centre to inform them of the timing and duration of the works and lane closure if required.</p> <p>Minimise disruption of the lane closure where practicable, with consideration to public safety at all times.</p>
	Potential impacts to local beaches	<p>Liaison with the PRoW Officer to identify suitable temporary diversion routes and/or plan appropriate temporary beach closure.</p> <p>Good communication with local community to inform of any PRoW temporary diversions and closures, to avoid inconvenience.</p> <p>Minimise duration of closures wherever practicable, with consideration to public safety at all times.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		Reinstatement of all features immediately following construction phase.
Chapter 24 Geology, Water Resources and Land Quality	Geological features	<p>In order to reduce the impacts to underlying geology from general trenching, piling, drilling and construction activities including spills and leakages to geological features a Construction Environmental Management Plan (CEMP) will be developed in consultation with the contractor and the EA. This will include measures for avoiding the likelihood of spills and leakages, such as:</p> <ul style="list-style-type: none"> • The implementation of properly designed shoring systems to avoid unstable excavations; • The removal of superficial deposits should be minimised wherever possible; • Storage of oils and fuel within designated areas in impervious storage bunds with a minimum of 110% capacity to contain any leakages of spillages; • Limiting of refuelling activities to designated, impermeably surfaced areas and use drip traps where possible; • Checking and maintain equipment regularly to ensure that leakages do not occur; • Having spill kits available on site at all times; and • Ensuring site inductions are completed for all staff including contractors and sub-contractors; include the above procedures and the locations of spill kits.
	Surface water quality (where excavation and stockpiling is used)	<p>Where earthworks are undertaken, soil and water will be managed with sufficient care to prevent surface water run-off.</p> <p>Stockpiles will be designed and positioned in order to minimise erosion, pollution of watercourses or increase flooding. All stockpiling will be undertaken at a safe distance from watercourses.</p>
	Surface water quality (where crossing or working near water courses)	<p>Entry into water will be avoided where possible.</p> <p>All cables will be installed beneath the active channel bed.</p> <p>The top of the crossing will be kept below the top of the adjacent bank level to ensure that in the event of high flows, the water will overtop the obstruction, rather than resulting in</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>impoundment and localised flooding.</p> <p>Temporary crossings will be appropriately sized to maintain flow patterns and sediment conveyance, and avoid unnecessary changes to the hydromorphology of the watercourses; No culverts are planned as temporary crossings of watercourses. Clear span bailey bridges (or similar) will be used in preference to avoid impacts to the hydromorphology of the watercourses. Adherence to best practices and guidance to ensure the risk of pollution is minimised (see section 2).</p> <p>A temporary haul road bridge should be constructed if repeated crossings are required; If cement etc. Is likely to be batched on site a suitable area should be designated and located at an appropriate distance from the watercourse.</p> <p>Works will be thoroughly planned and controlled in order to minimise the risk of pollution; In areas where there is likely to be large quantities of silt generated, straw bales or sediment traps will be placed in the watercourse downstream to help filter out any silts.</p> <p>Where the water flow is high, water will be over pumped during construction to prevent flooding upstream.</p> <p>Adherence to best practices and guidance to ensure the risk of pollution is minimised; If there is a requirement for dewatering of excavations, water will be pumped out and passed through a settlement tank or lagoon to allow suspended solids to settle out before being discharged to an appropriate location.</p> <p>Appropriate treatment methods will be adopted prior to discharge of the water from any land drains uncovered during the construction phase.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
	Surface water quality (where HDD used)	<p>In accordance with best practice, the HDD will commence at a safe distance from the edge of the each watercourse. The distance will be agreed with the EA prior to commencement of the works.</p> <p>The process of HDD involves the use of bentonite (used as a lubricating agent and grout); in order to reduce the risk of pollution of surface waters and / or break out in the river bed the use of these materials will be carefully controlled.</p> <p>In order to reduce the likelihood of pollution from bentonite and / or grout when working near rivers, hydrophobic (water repelling) grout and quick setting mixes will be used.</p> <p>If cement etc. is likely to be batched on site a suitable area will be designated and located at an appropriate distance from the watercourse.</p>
	Impacts on construction workers and future site operators	<p>Construction workers including sub-contractors will follow good site practices and hygiene rules as set out in BS5930 and BS10175:2011.</p> <p>Appropriate Personal Protective Equipment (PPE) will be worn by construction workers including sub-contractors and health and safety measures undertaken to mitigate any short term risk during construction.</p> <p>Gas risks will be considered for all construction workers including sub-contractors whenever there is a requirement to enter confined spaces as part of the construction works, this will be managed through the Construction Phase Health and Safety Plan.</p> <p>All construction works should be undertaken following best practice and in-line with the CDM Regulations.</p>
	Generation of waste arisings	<p>The waste hierarchy will be used to determine the most sustainable option for all wastes that are generated on-site;</p> <p>Suitable local schemes will be identified where possible, as appropriate receiving sites to encourage the off-site reuse of surplus subsoil – this promotes the waste hierarchy and will reduce vehicle emissions caused by longer journeys.</p> <p>Any hazardous wastes will be stockpiled or stored separately from any non-hazardous stockpiles.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>The Contaminated Land: Applications in Real Environments Code of Practice (CL:AIRE CoP) will be followed to demonstrate that excavated material is not waste at the point of reuse. Where the CoP cannot be followed, the use of waste material will be covered by an environmental permit, or appropriate exemption from environmental permitting (e.g. re-use of waste hardcore for temporary roads).</p> <p>A Site Waste Management Plan (SWMP) will be prepared to monitor wastes arisings on-site. This will also promote sustainable waste management practices by maximising waste prevention, re-use and recycling for material destined for off-site waste management. This will actively discourage sending waste to landfill.</p>
	Soil quality	<p>In order to reduce the risk of impacts from general site activities including spill and leakages to soil a Construction Method Statement will be produced by the contractor and a Construction Environmental Management Plan (CEMP) will be developed in consultation with the contractor and the EA. The CEMP will include measures for avoiding the likelihood of spills and leakages, such as:</p> <ul style="list-style-type: none"> • Store oils and fuel within designated areas above ground and in impervious storage bunds with a minimum of 110% capacity to contain any leakages or spillages, in addition storage areas will be regularly inspected to identify any leak or spills; • Limit refuelling activities to designated, impermeable surfaced areas and use drip traps where possible; • Check and maintain equipment regularly to ensure that leakages do not occur; • Have spill kits available on site at all times; and • Ensure site inductions for all staff, to include the above procedures and the locations of spill kits.
Chapter 25 Terrestrial Ecology	Redcar to Saltburn Coast LWS	<p>Construction working areas will be minimised as far as practicable, especially at the foreshore, and will be fenced to ensure there is no encroachment outside of the agreed working areas.</p> <p>No storage of materials or machinery will be permitted outside the working width and within the boundary of the LWS.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>An Ecological Clerk of Works (ECW) will provide toolbox talks to contractors, supervise vegetation clearance prior to construction and oversee key construction activities; Inform Tees Valley Wildlife Trust in advance of works taking place.</p> <p>Strict adherence to all mitigation measures outlined for dust in Chapter 30 Air Quality, including damping down dusty surfaces, temporary covering of earthworks and the implementation of a 'Dust Management Plan'.</p> <p>Reinstatement of habitats affected by the works following construction.</p>
	Impact on hedgerows, woodland and scrub	<p>The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint.</p> <p>Ideally, any vegetation clearance shall be undertaken outside the breeding bird season (early March to end of August inclusive, with seasonal variation). If this is not possible, an ecologist will check the area prior to clearance for active nests. Any active nests will be left in situ with an appropriate buffer within which no works will be undertaken until the nest is no longer occupied.</p> <p>Following construction, the hedgerow will be reinstated as soon as possible. Hedgerows will be re-planted with regionally appropriate, species rich planting.</p>
	Impact on bats	<p>The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint.</p> <p>For night-time lighting at the converter stations site, cable route construction corridor and for any occasions where task lighting is required, low pressure sodium lamps will be used (instead of mercury or metal halide lamps). The lighting should be directional and spill minimized through the use of hoods, cowls, louvres or shields. Ideally, movement sensors will be used to reduce the overall duration that lighting is on each night;</p> <p>Following construction, the hedgerow will be reinstated as soon as possible. Hedgerows will be re-planted with regionally appropriate, species rich planting.</p> <p>Should any trees require removal, a bat visual assessment and surveys (if required) will be undertaken. Mitigation will be designed and a licence (if required) obtained from Natural England prior to works.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>At the converter stations site, as part of screening, areas of additional native woodland and copses will be planted. This will improve the existing woodland habitat within the converter stations site and provide further opportunities for foraging bats.</p>
	Impacts on wintering birds	<p>Construction activities within the coastal fields and at the landfall location, which could potentially directly affect 6% of the fields, will be avoided during the key months of November – December. A combination of the following mitigation measures shall be implemented during the remaining autumn/winter months (October, January – March inclusive) in order to reduce impacts further:</p> <ul style="list-style-type: none"> • Clear fencing of the working area and restriction of personnel movements outside the working area; • Installation of hoarding along the edge of the working area to reduce visual disturbance; • Strict adherence to all mitigation measures outlined in Chapter 29 Noise and Vibration; • Noise levels will be kept to a minimum and wherever possible silenced equipment and sound mufflers will be used; • Following construction, reinstatement of all land within the working footprint; and • Supervision of key stages of the works by an Ecological Clerk of Works (ECW).
	Impacts on breeding birds	<p>The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint;</p> <ul style="list-style-type: none"> • Ideally, any vegetation clearance will be undertaken outside the breeding bird season (early March to end of August inclusive, with seasonal variation). If this is not possible, an ecologist will check the area prior to clearance for active nests; • Should an active nest be found during construction, works will cease immediately and an exclusion zone of 10m will be set up around the nest until the young have fledged; • If the bird is a Schedule 1 species (not anticipated since none have been recorded during surveys), then work will cease and Natural England consulted with regard to an appropriate course of action to avoid disturbance to the species; • Ensure construction plant and traffic activity is kept to designated access roads to avoid disturbance to ground nesting birds; • Following construction, reinstatement of all habitats to their former condition,

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>including hedgerow re-planting with regionally appropriate, species rich planting; and At the converter stations, as part of screening, areas of additional native woodland and copses will be planted. This will improve the existing woodland habitat within the converter site and provide further opportunities for breeding birds.</p>
	Impacts on badgers	<p>A brief walkover survey will be undertaken of the proposed works area (including cable route, compounds, HDD locations, access points etc.) and up to 50m around, to ensure that no new badger setts have been constructed prior to works beginning; Should a badger sett be identified, appropriate mitigation (e.g. licensing) would be implemented prior to works commencing; and A means of escape (e.g. plank of wood) will be provided in any excavations left open overnight.</p>
	Impacts on otters	<p>During the construction phase of works, the site compounds will be securely fenced to prevent otters entering the compounds. There will be strict adherence at all times to pollution prevention guidelines, in order to minimise the risk of pollution; During the brief walkover survey for otters, the watercourses that will be crossed by the cable will be re-assessed for their potential to support otter; and Should any watercourse be considered suitable for the species, an otter survey will be undertaken and if otter signs are detected, appropriate mitigation would be implemented in advance of works taking place.</p>
Chapter 26 Land Use and Agriculture	Land taken out of existing use	<p>Following the completion of the construction stage the majority of the areas will be reinstated to their former condition and land use. The exception to this is the land at the converter stations site which is discussed in operational impacts Section 7 in Chapter 26 Land Use and Agriculture.</p> <p>The construction footprint will be minimised where possible and land reinstated to its former condition as soon as reasonably possible following cable installation, dependent on weather conditions.</p>
	Impacts on land under environmental stewardship	<p>Full and continued consultation with landowners/occupiers will be undertaken, and advice sought during the site planning and construction phase, to ensure that the potential impacts of construction activities upon land in Environmental Stewardship are minimised, for example through the phasing of works to allow new environmental stewardship sites to be identified before existing stewardship sites are impacted.</p> <p>Landowners/occupiers will be compensated for any resultant losses incurred as a direct</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		consequence of the works.
	Soil degradation	<p>Soils handled, stored and reinstated by a competent contractor under Defra (2009) Code of Construction Practice (CoCP) for the Sustainable Use of Soils on Construction Sites.</p> <p>Topsoil will be stripped within all construction areas and stored adjacent to where it is extracted where practical.</p> <p>The subsoil excavated will be stored separately from the topsoil, with sufficient separation to ensure segregation.</p> <p>During wet periods, construction methods will be limited where vulnerability to soil compaction is identified.</p> <p>Heavy plant and vehicles will only be able to use specific routes.</p> <p>The excavation footprint will be minimised where possible.</p> <p>In circumstances where construction has resulted in soil compaction, further remediation will be undertaken, through an agreed remediation strategy.</p> <p>Detailed pre and post soil condition surveys to a minimum depth of 1.5 will be undertaken to allow mitigation measures to be appropriately designed and to monitor the success of the soil reinstatement, typically surveys would be undertaken for each landowner.</p> <p>The surveys will also include soil descriptions to be used to identify the soil's susceptibility to damage through the mechanism of compaction.</p> <p>Detailed method statements will be produced and agreed with the relevant regulator, in advance of the works. Contractors will be required to comply with these.</p>
	Loss of soil resource (erosion)	<p>Adherence to the MAFF (2000) Good Practice Guide for Handling Soils and Defra (2009) Construction code of practice for the Sustainable Use of Soils on Construction Sites.</p> <p>These include:</p> <ul style="list-style-type: none"> • Only working in appropriate weather conditions where soil type dictates;

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<ul style="list-style-type: none"> • Appropriate soil storage; • Maintaining effective field drainage systems during construction; • Ensuring reinstatement of individual fields occurs as soon as practical after construction; • Planting vegetation shortly afterwards; • Soils will be reinstated where possible; • Installation of pre-construction header drains on the uphill side of the working strip; • Post-construction drains installed and stone backfill if required; and • In areas of clay subsoil pre-construction drainage will be installed to maintain existing drainage systems and avoid disruption to the cable installation due to water collecting in the excavated trenches. <p>If this is not feasible then soils may be re-used on site where a need has been identified within the Site Waste Management Plan, which has been prepared and discusses the disposal options and waste hierarchy in more detail.</p>
	Loss of soil resource (excavation)	<p>Soils will be reinstated where possible.</p> <p>If this is not feasible then soils may be re-used on site where a need has been identified within the SWMP (Appendix 24C Site Waste Management Plan), which has been prepared and discusses the disposal options and waste hierarchy in more detail.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
	Land drainage	<p>Consultation with landowners and occupiers to establish existing drainage arrangements, location of drains (ideally access to drainage plans where available) and any other information.</p> <p>Working method statements produced for different drainage systems.</p> <p>Excavation of soil should only occur in suitable weather conditions, dependent on soil type; Where necessary the following techniques will be considered:</p> <ul style="list-style-type: none"> • Installation of pre-construction header drains on the uphill side of the working strip; • Post-construction drains installed and stone backfill if required; and • In areas of clay subsoil, pre-construction drainage will be installed to maintain existing drainage systems and avoid disruption to the cable installation due to water collecting in the excavated trenches. <p>Post construction, drains will be fully re-instated to their former condition and functioning, where possible.</p> <p>Minimisation of the period for which drains are not fully operational.</p> <p>Where surface drains and ditches are encountered, and crossed via open-cut installation techniques they will be dammed and a pipe or pump will be installed to ensure water flow is maintained during the cable installation process.</p>
	Biological contamination	<p>Defra (2003) has identified a number of best practice measures to minimise the risk of spreading disease. These measures include but are not limited to:</p> <ul style="list-style-type: none"> • Agreeing access arrangements with landowners and occupiers in advance of any construction works taking place; • Minimising where possible the movements of people, vehicles or equipment into areas where farm animals are kept; and • Cleaning equipment upon arrival and departure.

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
	Disturbance and nuisance	<p>Continued regular liaison with landowners and occupiers will continue throughout the construction phase to ensure concerns are alleviated as soon as possible.</p> <p>Tool box talks/training for construction workers on minimising the impact.</p> <p>A protocol for issues to be raised, considered and addressed will be established and distributed to all landowners/occupiers and contractors.</p>
	Secondary impacts	<p>A commitment will be made within the private treaty agreement between the future developers and operators of the development and the landowner/occupier to compensate for crop loss incurred as a direct consequence of the construction phase of the project.</p>
Chapter 27 Terrestrial Archaeology	Impact on archaeological deposits	<p>An archaeological mitigation strategy will be produced which will set out the methodology for conserving the archaeological resource and will entail a systematic programme of archaeological investigation comprising one or all of the following stages of work:</p> <ul style="list-style-type: none"> • Detailed desk-based research; • Trial trench evaluation; • Detailed excavation, post-excavation assessment and analysis; • Watching brief during specific construction activities, recording and reporting; and • Deposition of archive with RCBC and Tees archaeology. <p>The mitigation strategy will be discussed and agreed with RCBC.</p> <p>All stages of field work and reporting will be in accordance with Institute for Archaeologists (IfA) guidance and a WSI.</p> <p>Prior to construction works, known archaeological assets will be fenced to create a physical barrier between the asset and construction activities.</p>
Chapter 28 Traffic and Access	Highway Safety	<p>Implementation of a Construction Traffic Management Plan.</p> <p>Implementation of a Construction Travel Plan for workers.</p> <p>Best Practicable Means (BPM) to be employed during the construction phase.</p> <p>To reduce potential construction noise impacts at receptors where the magnitude of impact is</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>predicted to be greater than low, a solid site boundary hoarding fence, approximately 2.4m in height, will be erected prior to commencement of cable installation and remain in place until the works are complete.</p> <p>Access 1 A1085 Coast Road Temporary direction and warnings signs to advise of turning vehicles will be provided in accordance with Chapter 8 of the Traffic Signs Manual¹. This signage will highlight the proposed accesses to drivers to avoid late breaking manoeuvres and highlight to the travelling public the potential for turning vehicles. The current speed limit is 40mph and it is proposed to provide an advisory 30mph speed limit in the vicinity of the access throughout the duration of the works.</p> <p>Access 2 Redcar Road Temporary direction and warnings signs on Redcar Lane to advise of turning vehicles.</p> <p>Access 3 and 4 A174 South of Redcar The geometry of the bell mouths will be such as to prevent vehicles from right turning in and out of the construction access and from crossing from one access to the other. Instead vehicles will use adjacent roundabouts on the A174 to complete U-turning manoeuvres. The access geometry will reduce the risk of rear end shunts and collisions between turning vehicles. The current speed limit is 60mph and it is proposed to provide an advisory 30mph speed limit in the vicinity of the accesses throughout the duration of the works. Temporary direction and warnings signs to advise of turning vehicles.</p> <p>Access 5 Grewgrass Lane The current speed limit is 60mph and it is proposed to provide an advisory 30mph speed limit in the vicinity of the access throughout the duration of the works. The temporary speed limit will allow for the provision of a reduced visibility splay recognising the temporary nature of the works and the environmental impact of removing large sections</p>

¹ Traffic Signs Manual, Chapter 8, Traffic Safety Measures and Signs for Road Works and Temporary Situations. Parts 1 and 2

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>of mature hedge.</p> <p>Temporary direction and warnings signs to advise of turning vehicles.</p> <p>Access 6 and 7 B1269 The current speed limit is 60mph and it is proposed to provide an advisory 30mph speed limit in the vicinity of the accesses throughout the duration of the works.</p> <p>The temporary speed limit will allow for the provision of a reduced visibility splay recognising the temporary nature of the works and the environmental impact of removing large sections of mature hedge.</p> <p>Temporary direction and warnings signs to advise of turning vehicles.</p> <p>Accesses 8 & 9 Wilton Complex The Wilton Complex is already sign posted and drivers will be directed which entrance to use.</p> <p>Access 10 B1380 High Street Temporary direction and warnings signs to advise of turning vehicles will be provided. Implementation of a Construction Traffic Management Plan.</p>
Chapter 29 Noise	On-site construction noise	<p>To reduce potential construction noise impacts at receptors where the magnitude of impact is predicted to be greater than low, a solid site boundary hoarding fence, approximately 2.4m in height, could be erected prior to commencement of cable installation and remain in place until the works are complete in the relevant section of the cable route. Any fence would be located as close to the receptor as possible but still remaining within the easement.</p> <p>A set of generic Best Practice working practices referred to as Best Practicable Means (BPM) are advised to be employed during the construction phase. Examples of typical BPM include:</p> <ul style="list-style-type: none"> • Locating static noisy plant in use as far away from noise sensitive receptors as is feasible for the particular activity; • Ensuring that plant and equipment covers and hatches are properly secured and

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
		<p>there are no loose fixings causing rattling;</p> <ul style="list-style-type: none"> • Using the most modern equipment available and ensuring such equipment is properly maintained and operated by trained staff; • Using silenced equipment where possible, in particular silenced power generators if night time power generation is required for site security or lighting; • Ensuring that vehicles and mobile plant are well maintained such that loose body fittings or exhausts do not rattle or vibrate; • Ensuring plant machinery is turned off when not in use; • Imposition of vehicle speed limits for heavy goods vehicle traffic travelling on access roads close to receptors and ensuring that vehicles do not park or queue for long periods outside residential properties with engines running unnecessarily; • Ensuring, where practicable, that site access routes are in good condition with no pot-holes or other significant surface irregularities; • Maintaining good public relations with local residents that may be affected by noise from the construction works. Effective communication should be established prior to construction works, keeping local residents informed of the type and timing of works involved, paying particular attention to potential evening and night time works and activities which may occur in close proximity to receptors. Leaflet drops, posters and public meetings or exhibitions are an effective method of keeping local residents informed; • Provision of contact details for a site representative in the event that disturbance due to noise or vibration from the construction works occurs; ensuring that any complaints are dealt with promptly and that subsequent resolutions are communicated to the complainant; and • If night time works are envisaged then a Section 61 Prior Consent Notice should be sort from RCBC. This is a formal agreement that construction noise will be managed in accordance with 'best practicable means' (as outlined above).

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
Chapter 30 Air Quality	Air quality impacts associated with Non-Road Mobile Machinery (NRMM)	<p>All NRMM will use fuel equivalent to ultra-low sulphur diesel (fuel meeting the specification within EN590:2004);</p> <p>All NRMM will comply with either the current or previous EU Directive Staged Emission Standards (97/68/EC, 2002/88/EC, and 2004/26/EC). As new emission standards are introduced the acceptable standards will be updated to the previous and most current standard;</p> <p>All NRMM will be fitted with Diesel Particulate Filters conforming to defined and demonstrated filtration efficiency (load / duty cycle permitting);</p> <p>The ongoing conformity of plant retrofitted with Diesel Particulate Filters, to a defined performance standard, will be ensured through a programme of onsite checks; and</p> <p>Implementation of energy conservation measures including instructions to: throttle down or switch off idle construction equipment; switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded; ensure equipment is properly maintained to ensure efficient energy consumption.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Construction phase		
	Air quality impacts associated with dust	<p>Earthworks:</p> <ul style="list-style-type: none"> • Damping down all dusty activities and surfaces, especially during dry, windy weather; • Temporary covering of earthworks, or if possible secure covering during dry, windy weather; • Re-vegetation of earthworks and other exposed areas to stabilise surfaces; • Reuse hard core material where possible; • Removal of secure covers in small areas during work; and • Implementation of hessian or mulches where it is not possible to re-vegetate or cover with topsoil. <p>Trackout (the transport of dust and dirt from the construction site onto the public road network):</p> <ul style="list-style-type: none"> • Use of a wheel wash, limiting of vehicle speeds onsite, avoidance of unnecessary idling of engines and routing of site traffic as far from residential and commercial properties as possible; • Avoid dry sweeping of large areas; • Ensure vehicles transporting material entering and leaving sites are covered to prevent escape of materials during transport; • Use of a road sweeper to clean mud and other deposited particulates from hard-standing roads and footpaths; and • Use of hard surface haul routes where possible.

Table 2.3 Summary of measures in the operation phase

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Operation phase		
Chapter 8 Designated Sites	N/A	Mitigation and monitoring measures relevant to designated sites are covered under each relevant topic, namely Marine and Coastal Ornithology, Marine Mammals, Marine and Intertidal Ecology, Fish and Shellfish Ecology and Terrestrial Ecology.
Chapter 9 Marine Physical Processes	Scouring of turbine foundations	In the subtidal areas remedial scour protection may be necessary, scour protection measures will be developed and agreed with key stakeholders.
Chapter 10 Marine Water and Sediment Quality	Discharge of controlled and/or dangerous chemicals into the marine environment during O&M	Implementation of the measures contained within the Environmental Management and Monitoring Plan, which will include a Marine Pollution Contingency Plan, Chemical Risk Assessment & Waste Management Plan.
Chapter 11 Marine and Coastal Ornithology	Collision risk to birds	Aviation and navigation lighting will include design measures to reduce attraction of birds where practicable (but maintaining minimum requirements for safety purposes).
	Impacts of development on bird populations	O&M vessels associated with offshore wind farms will avoid areas of rafting seabirds during sensitive periods where practical.
	Habitat loss or degradation / Colonisation Impacts	Post-construction benthic surveys shall be undertaken. Surveys will be designed to enable potential operational phase impacts to be determined. The location of sampling stations within close proximity to installed foundations will ensure that any near-field changes in benthic habitats will be identified. Any monitoring programme will also include assessment of selected foundation structures in order to gather data on the long-term behaviour of colonising species on these structures.
Chapter 13 Fish and Shellfish Ecology	Habitat loss or disturbance	Pre and post construction surveys of fish species will be designed and undertaken the exact scope of these is to be agreed with the MMO and key stakeholders prior to construction commencing.
Chapter 15 Commercial Fisheries	Risk of gear snagging cables	Communications shall occur via the FLO regarding O&M vessel movements within wind farm and cable route.
	Risk of collision with O&M vessels and installed infrastructure/gear fastening risks	All infrastructure will be marked and appropriately lit at all times. All wind farm vessels will use agreed access routes and buoys.

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Operation phase		
		<p>The FLO will inform fishermen of proposed O&M works, schedules and associated proposed safety zones.</p> <p>Transiting work vessels shall comply with COLREGS.</p>
Chapter 16 Shipping and Navigation	Risk of unsafe passage within and adjacent to the wind farm site	<p>A Search and Rescue Emergency Response Co-operation Plan (SAR ERCoP) through discussion with the Maritime and Coastguard Agency (MCA) Search and Rescue and Navigation Safety Branches.</p> <p>The Aid to Navigation /markings for Dogger Bank Teesside A & B will be agreed in consultation with Trinity House Lighthouse Service.</p> <p>Cables and wind turbines will be marked on nautical charts in line with United Kingdom Hydrographic Office (UKHO) standards.</p> <p>All subsea cables will be subject to periodic inspection to ensure they do not become a hazard to marine navigation.</p>
	Risk of emergency/ pollution incident	Capacity and training of on-site vessels and crew will be maintained throughout operation to ensure provision of initial response to emergencies and pollution incidents.
Chapter 17 Other Marine Users	Oil and gas activity, scour from wind turbine foundations	If scour protection is necessary, scour protection measures will be developed and agreed with key stakeholders.
	Restriction of cable and pipeline maintenance	Forewind has established buffer zones and separation distances with cable and pipeline operators, which will be maintained during operation.
Chapter 18 Marine and Coastal Archaeology	Damage or destruction of archaeological deposits and material and their physical setting from indirect impacts	Scour and changes to physical processes shall be monitored as set out in WSI.
Chapter 19 Military Activities and Civil Aviation	Impact upon aeronautical SAR operations	The wind farm will be included on aeronautical charts, and the positions of individual wind turbines plotted for use in GPS/radar datasets.
		The wind farm/wind turbines shall be lit in accordance with requirements of CAA, MoD and

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Operation phase		
		<p>marine regulators.</p> <p>The wind turbines and blades shall be marked in accordance with requirements to ensure they are as conspicuous as possible during operation.</p>
Chapter 20 Seascape and Visual	Visual impact on seascape	In the absence of any land based receptors to be visually impacted by the development, and the over-riding need for it to be conspicuous to shipping, no additional mitigation is proposed during operation phase.
Chapter 21 Landscape and Visual	<p>Landscape and resources within the vicinity of the converter stations</p> <p>Visual impacts on residential, recreational and travelling receptors present within the vicinity of the converter stations</p>	<p>The extension of existing landscaped bunds to the east and north of the edge of the settlement Lazenby, in order to screen views available between the existing bunds, towards the development site.</p> <p>Native woodland vegetation planting on the top of the new bunds, to tie in with woodland planting on the existing bunds, with the aim of providing extra screening from the settlement edge in the long term, and to reduce visual impacts on the wider area.</p> <p>The design of permanent lighting to minimise glare and light spillage off-site, to the sky and to adjacent areas (particularly residential properties close to the site).</p> <p>The positioning of perimeter fencing so that it is screened behind the proposed bund and planting.</p>
Chapter 22 Socio-economics	N/A	No mitigation or monitoring is proposed during the operation phase.
Chapter 23 Tourism and Recreation	N/A	No mitigation or monitoring is proposed during the operation phase over and above that identified in Table 2.1 .
Chapter 24 Geology, Water Resources and Land Quality	Impact of converter station maintenance activities	<p>At the converter stations site, where it is not possible to store potentially contaminative materials off-site, arrangements will be made for storage in secure, bunded areas above ground level.</p> <p>Procedures will be put in place for identifying and reporting spillages or leakages either at the converter stations site or during maintenance activities along the cable routes, and consideration given to the storage of containment equipment (e.g. absorbent matting, plastic sheeting etc.) on site etc.</p> <p>The integrity of hardstanding at the converter stations and the drainage network will be</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Operation phase		
		<p>inspected regularly to ensure that damage to either do not result in the creation of a potential pathway by which contaminants could either enter groundwater or surface waters.</p> <p>Oil separators will need to be regularly inspected and maintained (emptied) when appropriate.</p> <p>A Package Treatment Plant solution to manage all wastewater / sewage originating from the converter stations will be located on site, any discharges associated with this will be agreed by the Environment Agency prior to operation.</p>
	Gas risk	<p>All buildings / foundations with confined spaces should be designed and built with gas venting / protection measures as a precautionary measure, in-line with current building regulations where applicable.</p> <p>Gas risks will be considered for all maintenance workers whenever there is a requirement to enter confined spaces. This should be managed through health and safety risk assessments.</p>
	Impacts on flood risk	<p>A suitable drainage system will be developed with sufficient volume to attenuate the 1 in 100 year (plus climate change) volumes.</p> <p>Any impermeable area associated with the National Grid works will in turn require an adequate drainage system to manage the surface water runoff. The form of this mitigation is to be confirmed by National Grid as part of their development proposals for the enabling works.</p> <p>The buried cable systems will be fully underground, and crossed watercourses will be fully reinstated; therefore there will be no residual flood risk issues associated with the cable route.</p>
	Contamination impacts on of geology, water resources and human health	<p>Best site management practices, such as those set out in the EA's PPG notes, will be adopted during the operational phase to prevent such spillages and leakages.</p>
Chapter 25 Terrestrial Ecology	Bats	<p>Establish sympathetic lighting.</p> <p>Maintain landscape planting.</p>

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Operation phase		
Chapter 26 Land Use and Agriculture	Land taken out of existing use	<p>Land take will be minimised to the area absolutely required to site the converter stations and associated landscaping.</p> <p>Forewind is actively involved in negotiations with the current landowners to secure the permanent land take, and compensation will form part of those private treaty discussions.</p>
	Impacts on land in areas of environmental stewardship	<p>Forewind is actively involved in negotiations with the current landowners to secure the permanent land take, and compensation will form part of those private treaty discussions.</p> <p>The landscape screening proposed at the converter stations site will contribute to providing more diverse habitats in the local area compared to an agricultural field and thus it is likely to contribute marginally towards the substantive objectives of the Environmental Stewardship Scheme.</p>
	Land drainage	<p>Following construction, field drainage systems and ditches will be fully reinstated where possible, in consultation with landowners/occupiers.</p> <p>Cable system buried at a sufficient depth to allow the continuation of current agricultural practices.</p> <p>Post-construction monitoring and consultation with landowners/occupiers to ensure reinstatement has been successful.</p> <p>In the event of any problems during post-construction monitoring further remediation work will be undertaken.</p>
	Impact on soil heating	<p>The following measures are dependent upon the electrical design, geology, soil type and characteristics, method of installation, depth of cable, weather conditions and electrical loading:</p> <ul style="list-style-type: none"> • Increasing horizontal separation of cables; • Selecting an optimum cable conduction material and diameter; • Undertaking pre-construction soil thermal resistivity surveys; • Changing the properties of the surrounding material (i.e. importing bedding/ backfill material); and • Increasing the insulation of cables.

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Operation phase		
	Restriction on land use practices	<p>Detailed assessments will be undertaken at the detailed design phase, prior to construction, to inform the design. This will include details of:</p> <ul style="list-style-type: none"> • Soil type and characteristics; • Types of crops grown; • Depth of field drains; and • Likely depth of root growth zone. <p>Discussions with landowners regarding potential future land uses and any restrictions on these as part of ongoing discussions.</p>
Chapter 27 Terrestrial Archaeology	Impact on archaeological deposits	No mitigation or monitoring is proposed during the operation phase over and above that identified in Table 2.1 .
Chapter 28 Traffic and Access	None identified	No mitigation or monitoring is proposed during the operation phase over and above that identified in Table 2.1 .
Chapter 29 Noise	None identified	<p>The converter station operational noise levels (at the nearest receptor) will be reduced to below the 42dB(A) threshold for residential receptors and 46dB(A) for non-residential receptors. The precise nature of mitigation will be determined during detailed design of the converter station. Typical measures will include:</p> <ul style="list-style-type: none"> • Selection of quieter equipment; • Installation of acoustic enclosures (a minimum 10dB reduction is required for the transformers); • Installation of acoustic barriers²; • Possibility to screen converter stations further by the construction of a landform/embankment around the site, which will protect against flooding and may also provide up to 10dB attenuation; • Silencing of exhausts/outlets for air handling/cooling units; and • Locating equipment to take advantage of screening inherent in the design, i.e. from the converter hall or control room buildings. <p>These measures are all good practice industry standard approaches to noise reduction.</p>

² 'Fire walls' may be required around the Converter Transformers, which may provide some acoustic benefit; however these were not accounted for in the assessment.

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Operation phase		
Chapter 30 Air Quality	None identified	No mitigation or monitoring is proposed during the operation phase over and above that identified in Table 2.1 .

Table 2.4 Summary of measures in the decommissioning phase

EIA topic (and chapter number)	Impact	Mitigation or monitoring measure
Decommissioning phase		
N/A	N/A	<p>At the end of the wind farm operational phase, decommissioning will be undertaken. This is expected to follow a broadly similar programme to the construction process but in reverse order.</p> <p>The decommissioning plan will take into account the latest technological advances as well as legislative and environmental requirements at the time that the work is due to be undertaken.</p> <p>Final decommissioning of the Dogger Bank Teesside A & B components or their replacements would be expected to take place at the end of the Crown Estate lease term. A separate EIA will be undertaken and approved by the relevant authority at that time.</p>

3. Future Monitoring and Mitigation

3.1. Future monitoring and mitigation

- 3.1.1. Forewind will adhere to all the DCO and Marine Licence conditions for implementing monitoring and mitigation measures as appropriate throughout the project life of Dogger Bank Teesside A & B and in consultation with key stakeholders.
- 3.1.2. Mitigation and monitoring plans will be routinely reviewed and maintained as part of the overall EMMP in order to ensure that they remain current and fit for purpose.
- 3.1.3. These would be managed and implemented by an Environmental Liaison Officer (or equivalent) who would also act as the interface between Forewind and all environmental stakeholders.
- 3.1.4. All relevant documentation will be kept current and regularly updated to ensure that it reflects the current industry best practices and conforms to relevant prevailing legislation.