VikingLink

nationalgrid

UK Onshore Scheme

Environmental Statement

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Chapter 29

Summary of Assessment & Conclusions

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Environmental Statement Volume 2			
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Glossary & Abbreviations

Glossary of Terms	
Term	**Meaning**
AC electricity transmission	Electric power transmission in which the voltage varies in a sinusoidal fashion. This is the most common form of electricity transmission and distribution.
base scheme design	The design of the UK Onshore Scheme for the purposes of the planning application.
connection point	The existing Bicker Fen 400 kV Substation; the point on the National Electricity Transmission System (NETS) where Viking Link connects.
the Contractor	Party or parties responsible for the detailed design and construction UK Onshore Scheme.
converter station	Facility containing specialist equipment (some indoors and some potentially outdoors) for the purposes of converting electricity from AC to DC or DC to AC.
DC electricity transmission	Electric power transmission in which the voltage is continuous. This is most commonly used for long distance point to point transmission.
detailed scheme design	The design of the Scheme developed by the Contractor within the Limits of Deviation (AC and DC cables) and Rochdale Envelope (converter station).
landfall	The area between Mean Low Water Springs and Mean High Water Springs where the Onshore and Offshore Schemes meet.
Limits of Deviation	These define the maximum extents of the corridor for which planning permission is sought and within which proposed DC and AC cable routes may be installed.
the Project	Viking Link, from the connection point at Revsing Substation in Denmark to the connection Bicker Fen Substation in Great Britain).
Rochdale Envelope	This defines the parameters of the proposed converter station for which planning permission is sought including its location, layout and dimensions.
the Scheme	UK Onshore Scheme from MLWS to the connection point comprising underground AC and DC cables, converter station and access road.
Transition Joint Pit	Buried concrete pit where onshore and submarine cables are physically jointed together.

List of Abbreviations	
Abbreviation	**Meaning**
AC	Alternating Current
AES	Agri-Environment Scheme
AGLV	Area of Great Landscape Value

List of Abbreviations	
Abbreviation	**Meaning**
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
ATC	Automatic Traffic Count
BBC	Boston Borough Council
BMV	Best and Most Versatile
BPM	Best Practicable Means
CEMP	Construction Environmental Management Plan
CTMP	Construction Traffic Management Plan
Db	Decibel
DC	Direct Current
DTM	Digital Terrain Model
EA	Environment Agency
EIA	Environmental Impact Assessment
ELDC	East Lindsey District Council
ES	Environmental Statement
GCN	Great Crested Newt
GVA	Gross Value Added
ha	hectare
HGV	Heavy Goods Vehicle
km	kilometre
kV	kilovolt
LCA	Landscape Character Assessment
LGS	Local Geological Site
LPA	Local Planning Authority
LWS	Local Wildlife Site
LWT	Lincolnshire Wildlife Trust
m	metre
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MSA	Mineral Safeguarding Area
MW	megawatt

List of Abbreviations	
Abbreviation	**Meaning**
NETS	National Electricity Transmission System
NGVL	National Grid Viking Link Limited
NKDC	North Kesteven District Council
NSR	Noise Sensitive Receptor
PRoW	Public Right of Way
RAF	Royal Air Force
RAM	Reasonable Avoidance Measures
RPG	Registered Park and Garden
SAC	Special Area of Conservation
SHDC	South Holland District Council
SHSP	Soil Handling & Storage Protocol
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom
UXO	Unexploded Ordnance
VP	Viewpoint
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
ZoI	Zone of Influence

1 Summary

1.1 Introduction

1.1.1 This chapter summarises the results of the Environmental Impact Assessment (EIA) of the potential effects of the construction and operation of the onshore UK components (UK Onshore Scheme) of Viking Link (also referred to as 'the Project'), as presented in this Environmental Statement (ES).

1.2 About Viking Link

1.2.1 Viking Link is a proposed 1,400 megawatt (MW) high voltage Direct Current (DC) electricity link between the British and Danish electricity transmission networks. It comprises approximately 762 km of onshore and submarine DC electricity transmission cables between new converter stations which are in turn connected to the high voltage electricity transmission networks at existing substations at Revsing, Jutland in Denmark and at Bicker Fen, Lincolnshire in Great Britain.

1.2.2 The UK Onshore Scheme comprises 67.16 km of underground DC cable from the proposed landfall site at Boygrift, East Lindsey to the proposed converter station site at North Ing Drove, South Holland. At the converter station electricity will be converted from DC to Alternating Current (AC) (or vice versa depending on the direction of operation). The proposed 2.34 km underground AC cable route will then connect the converter station to the National Electricity Transmission System (NETS) for distribution at the existing Bicker Fen 400 kilovolt (kV) Substation. The proposed converter station will be accessed via a new 2.8 km access road connected to the A52.

1.2.3 The planning application boundary for the UK Onshore Scheme occupies approximately 1,480 ha (14.80 km^2) extending across the administrative areas of East Lindsey District Council (ELDC), Boston Borough Council (BBC), North Kesteven District Council (NKDC) and South Holland District Council (SHDC). Multiple applications have been made to the Local Planning Authorities (LPAs) as summarised below:

- To ELDC for the installation of approximately 51.60 km of proposed underground DC cable, and associated temporary works.
- To BBC for the installation of approximately 9.78 km of proposed underground DC cable, approximately 1.13 km of proposed AC underground cable, and associated temporary works.
- To NKDC for the installation of approximately 4.80 km of proposed underground DC cable, and associated temporary works.

- To SHDC for the proposed converter station, 2.8 km long permanent access road, approximately 0.98 km of proposed underground DC cable, approximately 1.21 km of proposed AC underground cable, and all associated temporary works.

1.3 Development of the UK Onshore Scheme

1.3.1 The overall approach to the development of the UK Onshore Scheme is described in chapter 2 of the ES. In summary it has comprised two main steps; firstly, the identification and assessment of alternative landfall and converter station sites (Siting) and secondly the identification and assessment of alternative cable routes (Routeing). Through an iterative process considering potential impacts on the environment and local communities alongside technical and engineering considerations as well as feedback received from statutory and non-statutory consultees and members of the public the preferred UK Onshore Scheme was identified.

1.3.2 Following the identification of the preferred Scheme further refinement and design was undertaken in parallel with the EIA. This has informed the identification of the base scheme design which forms the basis of the planning application setting out the maximum parameters within which the appointed Contractor(s) will develop and construct the detailed scheme design. This approach has ensured that a number of mitigation measures have been embedded within the base scheme design or commitments made to environmentally sensitive construction methods and practices helping avoid or reduce potentially significant environmental effects as much as possible.

1.4 Results of the EIA

Intertidal Zone

Proposed DC Cable Route

1.4.1 The assessment considered the likely significant effects of the proposed DC cable route in the intertidal zone, the area between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS) including the effects on intertidal ecology and archaeology as well as the effects on coastal processes.

1.4.2 The proposed landfall site consists of a long strip of sandy beach backed by a large concrete sea wall with a narrow strip of vegetated dunes forming an embankment behind, which together form the main sea defence. The Boygrift Drain outfall is located in the north of the proposed DC route, emerging from the intertidal slope in the mid-shore and extending out into the lower shore, close to the MLWS.

1.4.3 Substrates at the proposed landfall site comprise sands of varying coarseness, limited areas of muddy sand and minor areas of gravelly sand. The intertidal habitats primarily comprise sandy sediments with naturally species-poor infaunal communities which are typical of dynamic sandy shore environments.

1.4.4 The proposed landfall site lies within a section of shoreline that is subject to a long term recorded trend of erosion. To reduce the effects of this the Environment Agency (EA) has undertaken a

major beach renourishment scheme, known as 'Lincshore' since 1994. The morphology at the proposed landfall is significantly influenced by the beach renourishment undertaken by the EA and the subsequent erosion of the sediment placed on the beach.

1.4.5 With regards to archaeology, there are no designated assets within the proposed landfall site. Geophysical surveys undertaken as part of the design of EIA of the Scheme have identified anomalies of uncertain origin which may be of archaeological interest within the landfall area, however, these have been avoided through route design and physical impacts will be minimised during construction. There is some limited potential for the discovery of previously unrecorded shipwrecks, and for the discovery of aircraft wrecks. However due to the regular exposure of underlying tills within the intertidal zone prior to the inception of the Lincshore renourishment scheme any wrecks lying within the intertidal zone are likely to have already been discovered.

1.4.6 Whilst there may be some potential impacts from the proposed DC cable route during installation of the cables through the intertidal zone these effects will be temporary and unlikely to result in a significant effect. Many of these potential effects which could occur have been mitigated through the design of the Scheme and its proposed installation methods. Impacts to the sea wall will be prevented by the use of 'trenchless' construction techniques. Ducts will be installed below wall and the cables pulled through these. The activities which will be undertaken to install the proposed DC cable route, whilst resulting in disturbance, are not likely to be of any greater significance than the existing abrasion and physical disturbance the area experiences through natural processes and the Lincshore renourishment scheme.

1.4.7 Additional mitigation such as the implementation of a Construction Environmental Management Plan (CEMP) and adoption of Best Practice during construction works to minimise the risk of pollution incidents have also been identified. Taking the mitigation into consideration, effects on receptors in intertidal zone are predicted to be negligible or minor adverse and are therefore not significant.

Geology & Hydrogeology

Overview

1.4.8 The assessment considered the likely significant effects of the Scheme on underlying geology and hydrogeology from MLWS to the existing Bicker Fen 400 kV Substation. This included consideration of the potential to affect sites of geological interest, sensitive groundwater supplies as well as the potential to encounter Unexploded Ordnance (UXO) or contamination.

Proposed DC Cable Route

1.4.9 Baseline studies have identified that the proposed DC cable route is underlain by varied geological strata and associated groundwater receptors including Unproductive strata (Saltmarsh and Tidal Creek Deposits/Marine and Estuarine Deposits), Secondary A aquifers (Glaciofluvial and Alluvial deposits), Secondary Undifferentiated aquifers (Till (Boulder Clay)) and Principal

solid geology aquifers (Spilsby Sandstone and Chalk). The proposed route also crosses a number of main rivers and several Internal Drainage Board (IDB) maintained watercourses.

1.4.10 There are only two designated areas or sites that are within proximity to the proposed DC cable route; Dalby Hill Chalk Quarry Local Geological Site (LGS) in Route Section 2 and a Mineral Safeguarding Area (MSA) for sand and gravel in Route Section 3.

1.4.11 Historical and current land use is almost entirely agriculture and as such with no discernible historical land uses have been identified that could have given rise to significant soil or groundwater contamination. There is some low potential for UXO to be present, such as in the vicinity of the former Royal Air Force (RAF) East Kirkby military airfield to the west of Route Section 3, however, this will be mitigated through the development of a UXO Risk Mitigation Management Plan. UXO clearance, if deemed to be a requirement, will be carried out.

1.4.12 Key elements of the mitigation relate to the effective and efficient management of excavated materials through the preparation of a materials management strategy, controls on how construction materials are handled and stored to prevent uncontrolled releases to ground and the design of earthworks within the working width and at locations where trenchless installation methods will be used. Further detailed ground investigation and hydrogeological modelling will be required to inform the detailed scheme design.

1.4.13 Taking account of the implementation of mitigation measures during construction it is predicted that there effects geological and hydrogeological receptors will be negligible or minor adverse and the risk of contamination is low or very low; consequently effects are not significant.

Proposed Converter Station

1.4.14 The superficial geology which underlies the proposed converter station site comprises the Barroway Drove Beds (Marine Deposits/Tidal Flat Deposits), overlying Till (Boulder Clay). The solid geology is indicated to be the Oxford Clay Formation. Both the superficial geology and solid geology aquifers are determined to be unproductive. There are no geologically designated sites or areas close to the proposed converter station.

1.4.15 Groundwater samples recovered at the proposed converter station site in 2016 indicated that the metals (nickel, cadmium, copper, zinc and boron), ammonia/ammoniacal nitrogen, and to a lesser extent sulphur, were recorded greater that the adopted screening values. However, in overall terms the geological and hydrogeological setting is considered to be of limited sensitivity.

1.4.16 Key elements of the mitigation required during construction are similar to those outlined above for the proposed DC cable route such as materials management and controls on the handling of construction materials. In addition the detailed design of the proposed converter station will include measures to prevent the uncontrolled release of potential pollutants to ground and ground gas mitigation.

1.4.17 Taking account of the implementation of mitigation measures during the construction and operation of the proposed converter station it is predicted that effects on geological and

hydrogeological receptors will negligible or minor adverse and the risk of contamination is low or very low; consequently effects are not significant.

Water Resources & Hydrology

Overview

1.4.18 The assessment considered the likely significant effects of the Scheme on water resources and hydrology from MHWS to the existing Bicker Fen 400 kV Substation. This included consideration of the potential to affect water quality, impacts on watercourses and drains crossed by the proposed DC cable route and flood risk in relation to the proposed converter station and permanent access road.

Proposed DC Cable Route

1.4.19 The majority of the proposed DC route is within Flood Zone 3 defined as at high risk of flooding from fluvial or tidal sources. There are a number of surface water courses, including two Chalk Streams (the River Lymn and an unnamed tributary) which require to be crossed by the proposed DC cable route, all of which have an overall Water Framework Directive (WFD) status of 'moderate'.

1.4.20 Other hydrological or hydrologically linked receptors within the vicinity of the proposed DC cable route include:

- Surface water abstraction licences (typically associated with spray irrigation).
- A number of Special Sites of Scientific Interest (SSSI's) including Sandilands Pit, Mavis Enderly Valley and Keal Carr.
- A number of ancient woodlands including Rigsby Wood, Horngy/Mother Woods and Callow Carr.

1.4.21 Mitigation measures to prevent or reduce potentially adverse impacts on these receptors include the use trenchless construction methods for the majority of watercourse crossings, as well as the sea wall at the proposed landfall site. This will prevent damage to watercourses and flood defences and reduce the risk of pollution incidents. Further good construction practices will be adopted as part of the construction of the proposed DC cable route including the use of bunded, impermeable areas for the storage of fuel and hazardous substances, and active surface water management (such as settlement ponds, interceptors and hydraulic brakes where necessary).

1.4.22 Taking account of the proposed mitigation measures, effects resulting from the construction of the proposed DC cable route are predicted to be to negligible to minor adverse and are therefore not significant.

Proposed Converter Station

1.4.23 The EA undefended flood map for planners indicates that the central and southern areas of the proposed converter station site, the AC cable route and the permanent access road are located

within Flood Zone 2 and 3, defined as at medium to high risk of fluvial/tidal flooding. The main South Forty Foot Drain is also located to the west of the proposed converter station site and is designated to have a WFD status of Moderate.

1.4.24 An assessment between modelled flood outputs and the proposed converter station levels indicates that the maximum flood extent reaches an average of 2.6 m Above Ordnance Datum (AOD), which compared against low lying land in the central (average 1.95 m AOD) and southern (average 1.8 m AOD) area of the proposed converter station equates to flood depths of 0.65 m and 0.8 m respectively.

1.4.25 The permanent access road using the publicly available Digital Terrain Model (DTM) and the maximum flood depth extents from the EA and SHDC mapping indicates a maximum flood depth of 0.66 m for a 1 in 100 year fluvial event combined with a 1 in 200 year tidal event during 2115 scenario taking in to account the influence of climate change.

1.4.26 To minimise potential future risk of flooding the proposed converter station site is proposed to be profiled to approximately 2.9 m AOD to be located above the 'worst-case' 1 in 1,000 year breach event (including the effects of climate change). Similarly, the proposed permanent access road will be profiled to 2.7 m AOD to avoid operational impacts from flooding. To attain these new levels and prevent loss of flood storage in the area (potentially causing an increase in flood extent elsewhere), material will be sourced within the existing converter station site and flood plain and therefore compensation for loss of flood plain is not required. In addition to mitigation for flood risk the base scheme design includes a defined "attenuation zone". In developing the detailed scheme design a settlement pond or similar will be located here to attenuate site drainage prior to it being discharged.

1.4.27 Similar to the proposed DC cable route a number of measures will be implemented during construction to prevent or reduce potentially adverse impacts on water resources. This includes the adoption of good construction practices to reduce the risk of pollution and measures to control and treat runoff from the construction site.

1.4.28 Taking account of the proposed mitigation measures, the effects resulting from the construction and operation of the proposed converter station, permanent access road and proposed AC cable route are predicted to be negligible to minor adverse and therefore are not significant.

Agriculture & Soils

Overview

1.4.29 The assessment considered the likely significant effects of the Scheme on agricultural land and soil resources from MLWS to the existing Bicker Fen 400 kV Substation. This included consideration of the potential to affect Agri-Environment Schemes (AES) and loss of agricultural land and the disturbance and/or loss of soil resources.

Proposed DC Cable Route

1.4.30 Potential impacts on agricultural land and soil receptors as a result of the proposed DC cable route have been identified, and could include the loss of agricultural land, the disturbance and loss of soil resources and the impact to AES eligibility.

1.4.31 Whilst these impacts cannot be avoided, with the implementation of suitable mitigation measures, the magnitude of effects can be reduced and the impacts can be managed. Mitigation will be implemented through embedded construction measures in the Soil Handling & Storage Protocol (SHSP), including best practice measures in accordance with the soil quality related industry good practice guidance. The implementation of the SHSP will ensure the maintenance of soil volumes and soil quality during construction activities, with topsoil replaced to the same depths as the original soil profile; and subsoil replaced to the same depths as the original soil profile where possible (taking account of the proposed DC cables) to ensure that the Agricultural Land Classification (ALC) status of land is restored.

1.4.32 The impacts on agricultural land quality and soil resource will be temporary, occurring for the duration of construction only, and can be fully mitigated by the adoption of best practice measures, ensuring the residual effects are not significant.

Proposed Converter Station

1.4.33 The potential impacts of the proposed converter station, permanent access road and proposed AC cable route include the loss of agricultural land, the disturbance and loss of soil resources, the impact to AES eligibility; and in the case for the proposed converter station and permanent access road, also impact the agricultural landholding. Whilst these impacts cannot be avoided, with the implementation of suitable mitigation measures, the magnitude of effects can be reduced and the impacts can be managed.

1.4.34 Mitigation will be implemented through embedded construction measures in the SHSP, including best practice measures in accordance with the soil quality related industry good practice guidance. The implementation of the SHSP will ensure the maintenance of soil volumes and soil quality during construction activities, with topsoil replaced to the same depths as the original soil profile; and subsoil replaced to the same depths as the original soil profile where possible owing to the placement of cable infrastructure to ensure that the ALC status of land is restored to the pre-commencement condition.

1.4.35 The short-term impacts on agricultural land quality and soil resource will be temporary and can be fully mitigated by the adoption of best practice measures, ensuring the residual temporary effects are not significant.

1.4.36 The permanent loss of Best and Most Versatile (BMV) agricultural land due to the proposed converter station and permanent access road will exceed 20 ha the iterative design process did consider BMV land and promoted the development of the converter station on the proposed site which contains lower graded land than other alternative converter station sites considered. Additionally, the permanent infrastructure has been micro-sited to avoid development of Grade 1

land as far as practicable, instead focusing development on non-agricultural land, non-BMV subgrade 3b and Grade 2 land.

Ecology

Overview

1.4.37 The assessment considered the likely significant effects of the Scheme on ecological interests including designated sites, protected species and habitats.

Proposed DC Cable Route

1.4.38 Four internationally designated sites are considered with respect to the base scheme design: Humber Estuary Special Protection Area (SPA)/Ramsar site, Saltfleetby-Theddlethorpe Dunes & Gibraltar Point Special Area of Conservation (SAC), The Wash SPA/Ramsar site and Gibraltar Point SPA/Ramsar site. There are six nationally designated sites (all SSSIs) within 2 km of the base scheme design, and 35 non-statutory designated sites within 1 km of the proposed DC cable route.

1.4.39 Much of the proposed DC cable route is dominated by intensive arable farmland dissected by drains of varying sizes which are heavily managed. Hedgerow habitat is present sporadically and is mostly species poor, well established and unmanaged. Small areas of semi-natural broad-leaved woodland and broad-leaved plantation woodland are present. Several watercourses are crossed and vary from significant drains such as Boy Grift Drain, Wold Grift Drain and South Forty Foot Drain to individual field ditches.

1.4.40 Records of protected or sensitive species within 1 km of the proposed DC cable route were generally similar throughout the proposed DC cable route with records returned for:

- Common frog, common toad, smooth newt and Great Crested Newt (GCN).
- Water vole and otter.
- Badgers.
- Waders and wildfowl in Route Section 1 changing to more passerine species further south. Species includes (but not limited) to wigeon, teal and fieldfare.
- A range of breeding bird species characteristic of open arable farmland, including (but not limited to) dunnock, grey partridge, house sparrow, linnet, skylark, song thrush, tree sparrow, yellowhammer and yellow wagtail.
- Grass snake and slow worm.
- Brown hare.

1.4.41 To minimise potentially adverse impacts on ecological receptors, embedded mitigation such as the legal compliance for construction works activities in proximity of known protected species or habitat suitable for their refuge. This includes Reasonable Avoidance Measures (RAMs) for reptiles, pre-construction surveys, phased vegetation strimming, and setting exclusion zones where relevant. In some instances licenses for the disturbance of species may be required (such

as the disturbance of badger setts), and in such instances works will be carried out in accordance with the requirements of these licenses.

1.4.42 Further to these measures in some more sensitive locations (such as adjacent to Huttoft Bank Pit Lincolnshire Wildlife Trust (LWT) Reserve, River Witham and South Forty Foot Drain), where aggregations of wintering birds are likely to be present screening will be erected around construction works.

1.4.43 Following implementation of the mitigation there are anticipated to be no significant impacts on ecological receptors from the construction or operation of the proposed DC cable route.

Proposed Converter Station

1.4.44 No international or national designated sites are located within 10 km of the base scheme design. South Forty Foot Drain Local Wildlife Site (LWS) is located 0.7 km to the west of the proposed converter station.

1.4.45 The predominant habitat within the proposed converter station site is arable farmland, with field boundaries mainly comprising a network of drainage ditches and occasional hedgerows. Several small patches of relatively young broad-leaved plantation woodland are present along with approximately 18 trees, the majority of which are also relatively young.

1.4.46 A small population of GCN is present within the Bicker Fen 400 kV Substation based on desktop records from 2015. Small newt, common toad and common frog have been recorded during surveys.

1.4.47 There is also potential for the presence of: bats (foraging and roosting), water voles (within the pond in the Bicker Fen 400 kV Substation), and badgers as well as grass snake, common lizard, slow worm and brown hare.

1.4.48 Land within 500 m of the base scheme design is known to support low numbers of wintering birds, with occasional moderate sized flocks of starling, fieldfare and redwing.

1.4.49 This area is not used by flocks of wintering wader and wildfowl species. The base scheme design is used by low numbers of farmland passerine bird species characteristic of an open arable habitat which are prevalent within the wider landscape.

1.4.50 To minimise potentially adverse impacts on ecological receptors, embedded mitigation such as the legal compliance for construction works activities in proximity of known protected species or habitat suitable for their refuge. This includes RAMs for reptiles, pre-construction surveys, phased vegetation strimming, and setting exclusion zones where relevant.

1.4.51 Following implementation of the mitigation there are anticipated to be no significant impacts on ecological receptors from the construction or operation of the proposed converter station.

Landscape & Visual Amenity

Overview

1.4.52 The assessment considered the likely significant effects of the Scheme on landscape character and visual amenity from MLWS to the existing Bicker Fen 400 kV Substation. This included consideration of the temporary and permanent impacts on landscape character and landscape designations as well as changes in the visual amenity of residents or visitors in the vicinity of the Scheme.

Proposed DC Cable Route

1.4.53 Three landscape designations were identified close to or interesting the proposed DC cable Route: the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB), East Lindsey Area of Great Landscape Value (AGLV) and Well Hall Registered Park and Garden (RPG). The landscape varies considerably along the proposed DC cable route, from the wide coastal plain inland from Mablethorpe and Skegness, to the rolling farm land of the Lincolnshire Wolds and the large scale, flat and open landscape of the Fens to the south and west.

1.4.54 In general the area within and adjacent to the proposed DC route is well settled, with numerous smaller villages, hamlets and scattered properties, particularly in sections of the route around main transport corridors and the wider road network.

1.4.55 A series of 19 viewpoint locations have been identified forming the basis of the visual assessment. These viewpoint locations were selected in consultation with LPAs and provide a representative cross section of visual receptors found and include settlements and residential properties, recreational routes, and major and minor roads.

1.4.56 Minor adverse (not significant) residual effects are anticipated on each of the landscape receptors. In general, although construction activity will result in direct and indirect change within each of the landscape designations and Landscape Character Assessments (LCAs) this will be localised, temporary and of short or medium duration, and would not influence the overall impression of the character of the landscape receptors.

1.4.57 Following the completion of construction there is anticipated to be little, if any, change to the overall impression of the character of each of the landscape receptors and as such the level of effect would reduce to negligible and therefore is not significant.

1.4.58 Receptors at the majority of viewpoints would experience effects which are predicted to be minor adverse or less and therefore are not significant. However, it is anticipated that residential receptors on the edge of Salesby, as represented by Viewpoint 3, would experience moderate adverse and therefore significant effects during construction. These effects will be limited to a small number of receptors on the edge of the settlement, with the majority of residential receptors within the village experiencing limited or no visibility of construction activity.

1.4.59 At operation, areas temporarily used for construction would be reinstated and although vegetation would not be fully re-established at winter year 1, differing land cover is not

uncharacteristic of this intensively managed agricultural landscape. Effects in the longer term are anticipated to be negligible and therefore are not significant.

Proposed Converter Station

1.4.60 No landscape designations were identified within the vicinity of the proposed converter station. The nearest landscape designations are the Lincolnshire Wolds AONB and East Lindsey AGLV, located approximately 35 km and 26 km away respectively and therefore considered unlikely to be significantly affected.

1.4.61 Two groups of landscape character were identified on which the assessment is based. The first group (Peaty Fens LCA), Holland Reclaimed Fen LCA, Fenland LCA and The Fens LCA) is defined by a low-level, largely flat, large scale and open, man-made landscape. There are a number of large scale electrical infrastructure developments within this landscape that have a strong influence on its impression. The second group (Settled Fens LCA and Bicker to Wyberton Settled Fen LCA) exhibit similars characteristics to that of the first, although with a greater concentration of built form, including the settlement of Donington.

1.4.62 In regards to visual amenity, much of the area is generally relatively sparsely settled, with the exception of the eastern edge which includes the larger settlement of Donington and the edge of the smaller settlements of Northorpe, Bicker and Bicker Gauntlet. There is also a sparse network of roads and Public Rights of Way (PRoWs).

1.4.63 A series of 10 viewpoint locations have been identified forming the basis of the visual assessment. These viewpoint locations have been selected in consultation with LPAs and are intended to provide a representative cross section of visual receptors and include settlements and residential properties, recreational routes, and major and minor roads.

1.4.64 Much of the mitigation for the landscape is embedded within the design of the proposed converter station. This includes enclosing much of the electrical infrastructure within buildings to reduce structural complexity, the location and orientation of the building have been selected to reduce visual impacts as far as practicably possible and an area of woodland planting is proposed around the perimeter to soften the appearance of the building.

1.4.65 However regardless of the mitigation measures embedded in base scheme design and proposed during construction, moderate adverse and therefore significant residual effects are anticipated on the physical site landscape during construction. During operation the extent of direct change on the physical site landscape would reduce slightly, particularly along the proposed AC cable route. However, it is anticipated that the overall level of effect on the physical site landscape would remain moderate adverse and is therefore significant.

1.4.66 Outwith the site landscape, effects on the Peaty Fens LCA, Holland Reclaimed Fen LCA, Fenland LCA and The Fens LCA group is anticipated to be minor adverse (not significant) at both construction and operation.

1.4.67 The Settled Fens LCA and Bicker to Wyberton Settled Fen LCA group is anticipated to experience minor adverse (not significant) effects at construction and operation, reducing to negligible effects in the longer term.

1.4.68 It is anticipated that receptors at three of the 10 viewpoints: North Ing Drove (Viewpoint 3); A52 Donington (Viewpoint 5); and South Forty Foot Drain, Bank End Farm (Viewpoint 7) would experience moderate adverse (significant) effects during construction. The extent of change at each of these viewpoints would be reduced at the operational phase. However, due to the close proximity of the proposed converter station and open nature of the view the effect during operation would remain at moderate adverse (significant).

1.4.69 Significant visual effects are limited to select receptor locations within 1 km of the proposed converter station. Due to the flat nature of the landscape, the level and significance of effect quickly reduces with distance such that receptors beyond 1 km would not be significantly affected. Therefore it is considered that although there are likely to be localised significant effects on a small number of receptors, the proposed converter station, permanent access road and the AC route would not significantly affect the overall visual amenity or its wider context.

Archaeology & Cultural Heritage

Overview

1.4.70 The assessment considered the likely significant effects of the Scheme on heritage receptors from MHWS to the existing Bicker Fen 400 kV Substation. This included consideration of the setting of receptors in the vicinity of the Scheme as well as physical impacts on receptors as a result of construction activity.

Proposed DC Cable Route

1.4.71 There are 34 heritage receptors within Route Section 1. Eight are of medium value and the remainder are of low value. The medium value receptors include three grade II listed buildings (LB33, LB34, LB27). The remaining receptors include a sea bank, a late Medieval earthwork enclosure and field boundary, a shrunken Medieval village with moated site and a tramway.

1.4.72 There are 68 heritage receptors within Route Section 2. Two are of high value, nine are of medium value and the remainder are of low value. The high value receptors comprise two scheduled monuments (SM3, SM5) of barrows which are not within the planning application boundary. The medium value receptors include a grade II listed building (LB28), barrow cropmarks (397,120), a scatter of Bronze Age flints (98), an Early/Middle Saxon settlement site (108), a WW2 crash site of a Lancaster bomber (409) and a disused railway (412). Other receptors within the route section include cropmarks of enclosures and trackways, including some of Prehistoric and Roman date and others that are undated; Medieval ridge and furrow; a Medieval trackway; a cropmark of a possible barrow and findspots dating to the Prehistoric and Roman periods.

1.4.73 There are 49 heritage receptors within Route Section 3, eight of which are of medium value whilst the remainder are of low value. The medium value receptors include a grade II listed building (LB32), findspots (83, 86, 87), potential dylings (329), a pillbox (116) and a disused railway (413). The low value receptors include findspots of Prehistoric flint and pottery and Roman pottery that could indicate settlement activity as well as Medieval ridge and furrow and a Post-Medieval park.

1.4.74 There are 43 heritage receptors within Route Section 4, one of which is of medium value and the remainder are of low value. The cropmark of Prehistoric/ Roman date (21) is of medium value. The remainder of the receptors include a Post-Medieval farmstead and a later Post-Medieval settlement/parish.

1.4.75 Route selection of the proposed DC cable route has been done in such a way to avoid all designated receptors. Temporary impacts to the setting of receptors within the vicinity of the proposed DC cable route will be mitigated through the adoption of good construction practices such as dust management, traffic management and pollution prevention measures as identified within the CEMP. Furthermore a four-tiered approach to mitigation will be implemented to mitigate longer term impacts. These include: Archaeological Watching Brief, Trial Trenching, Strip, Map and Sample and Detailed Archaeological Excavation. These will all be outlined within the Written Scheme of Investigation (WSI) and provide a means for preservation by record for any items found of archaeological value during construction.

1.4.76 Overall, taking account of the proposed mitigation the majority of heritage receptors will experience negligible or minor adverse effects (not significant). However two of the receptors (the Medieval Chapel of Well (92), and the Prehistoric/Roman crop markings at North Ing Drove (21)) are predicted to experience moderate adverse effects (significant).

Proposed Converter Station

1.4.77 There is one designated receptor that is relevant to this assessment. This receptor is a listed buildings of medium value (LB21). There are 27 non-designated receptors which could be impacted by the proposed converter station site, proposed AC cable route and permanent access road. There are four receptors located within the proposed converter station site (20, 21, 367, 369), all of which are of Roman date. Within the proposed AC cable route there is one spot find of a Prehistoric flint scraper (396), a Roman complex of enclosures, field boundaries and trackways (370), and a Post-Medieval flood defence ditch (392). Within the proposed permanent access road there is a Roman boundary ditch (4), an unnamed Post-Medieval farmstead (18), a Post-Medieval park (393), two areas of undated cropmarks (457, 458), and a Medieval watercourse (455).

1.4.78 There is also potential for previously unrecorded heritage receptors associated with archaeological remains of Roman and Post-Medieval date within the proposed converter station site, proposed AC cable route, and permanent access road.

1.4.79 As with the proposed DC cable route, a four-tiered approach to mitigation will be implemented to mitigate long term impacts. These include: Archaeological Watching Brief, Trial Trenching, Strip,

Map and Sample and Detailed Archaeological Excavation. These will all be outlined within the WSI and provide a means for preservation by record for any items found of archaeological value during construction.

1.4.80 Overall the majority of heritage receptors will experience minor adverse or negligible effects (not significant) with the application of the embedded design and construction mitigation. Significant effects are predicted on the Roman settlement and cropmarks (20 and 21, respectively) due to permanent changes to these historic assets as a result of construction activities, however, they will be mitigated as far as possible through pre-construction investigations.

Socio-economics & Tourism

Overview

1.4.81 The assessment considered the likely significant effects of the Scheme on heritage receptors from MLWS to the existing Bicker Fen 400 kV Substation. This included consideration of the impact on tourism and recreational features such as PRoWs as well as the impact of the Scheme on employment.

Proposed DC Cable Route

1.4.82 The proposed DC cable route is within one of the most sparsely populated counties in the UK and passes through the four districts of East Lindsey, North Kesteven, Boston and South Holland. Settlements and land-use within these areas is characterised by an urbanised coastal strip with a rural hinterland, comprising market towns and villages. Analysis of local population characteristics shows a higher proportion of people aged over 65, particularly within ELDC (26% compared to 16.4% for England).

1.4.83 Agriculture is a principal land use and employer within the area; the food and farming sector contributes most in terms of Gross Value Added (GVA) and employment to the four districts. The majority of businesses are classed as 'rural', which reflects the dominance of agriculture in Boston Borough and South Holland. Furthermore, the region's horticultural business is the second-most important in the UK with an estimated annual value of £470 million (2010). For example, within South Holland agriculture employs over 3,000 people directly and a further 10,000 people indirectly (approximately 15% of the population of the district).

1.4.84 The tourism industry is another important sector of the local economy, with strategic priorities for Greater Lincolnshire including improving the tourism product and selling the destination 'image'. Activity tourism – walking, cycling and the use of the waterways for example – is a particular strength in this area. Much of the tourism focus is primarily concentrated along the coastal strip and within the larger villages and towns in the rural hinterland.

1.4.85 Mitigation measures to prevent impacts to socio-economics and tourism include the adoption of good working practices as implemented through the CEMP. These include measures to reduce construction disturbance as much as possible in order to prevent impacts on tourism. Where any

PRoWs are to be impacted, suitable diversions will be put in place and signposted. Through the adoption of these good construction practices there are no significant effects identified.

1.4.86 Some construction activities will be required to be undertaken on the beach at Boygrift. The extent of the works areas and the timing in which works are undertaken will be planned to avoid impacting beach users as far as practicably possible, however it is also regarded that the limited space required and the availability of beach beyond the working areas is determined to be great enough for users to not be significantly impacted.

Proposed Converter Station

1.4.87 The proposed converter station site is located within the vicinity of local settlements including Donington and Bicker, and the hamlet of Northorpe. As with ELDC, SHDC also has a higher proportion of people aged over 65, (22.3% compared to 16.4% for England).

1.4.88 Other social and economic parameters remain the same as described for the proposed DC cable route, with a dominance of agriculture for employment and the economy. Tourism is typically active – walking, cycling and use of waterways – and limited in surrounding settlements. There are a number of local PRoW around the proposed converter station site, however these are of low usage and likely to be restricted to local users.

1.4.89 Mitigation measures to prevent impacts to socio-economics and tourism include the adoption of good working practices as implemented through the CEMP. These includes the limitation of noise, reduced air quality and visual amenity to surrounding land uses, such as limiting and controlling traffic movements and erecting hoarding. Where any PRoWs are to be impacted, suitable diversions will be put in place and signposted. Through the adoption of these good construction practices there are no significant effects identified for construction. However due to the alignment of the permanent access road it is likely that PRoW in the vicinity of Northorpe House (Doni/19/3) will need to be permanently stopped at the point of intersection with the permanent access road. This is likely to be a moderate adverse and therefore significant effect on users of this PRoW.

Traffic & Transport

Overview

1.4.90 The assessment considered the likely significant effects of construction traffic generated by the Scheme from MLWS to the existing Bicker Fen 400 kV Substation.

Proposed DC Cable Route

1.4.91 Baseline traffic conditions were established using Automatic Traffic Counts (ATCs) positioned in 100 agreed locations across Lincolnshire to collect base traffic flows on key roads in the area surrounding the proposed DC cable route.

1.4.92 Due to the remote nature of monitoring the proposed DC cable route, there are no anticipated impacts from operation of the DC cable. The greatest potential for impacts during construction is from the increased number of Heavy Good Vehicles (HGVs) on the local road network.

1.4.93 A Construction Traffic Management Plan (CTMP) will be implemented to provide mitigation for the HGV movements that occur during construction. This will reduce impacts as far as practicably possible. This will include the routeing of movements to avoid sensitive areas (use of A and B-roads only where possible), the use of banksmen when entering/exiting works areas, traffic signalling to ensure continued traffic movements and the implementation of speed limits for construction traffic to reduce the potential for incidents.

1.4.94 Following implementation of mitigation effects at all but 15 sites in the vicinity of the proposed DC cable route are predicted to experience minor adverse or negligible effects (not significant) on weekdays. On Saturdays all but 33 sites experience minor adverse or negligible (not significant). The potentially significant effects predicted on a Saturday are due to the limited number of HGVs in the baseline traffic flows, therefore any increase in HGVs would be substantial. Works on a Saturday only constitute around 16 % of the total working time during a given six day working week, therefore the impacts would be considered minimal in duration relative to the total working time.

1.4.95 All but 38 sites throughout the proposed DC cable route would experience minor adverse or negligible effects (not significant) on weekdays as a result of severance. On Saturdays all but 48 sites would have minor adverse or negligible effects (not significant).

Proposed Converter Station

1.4.96 Access to the proposed converter station site is proposed via a new permanent access road from the A52, a principal A-road. The A52 then links to a number of other principal A-roads on the strategic road network, such as the A15, A16, A17 and A1. These roads are all considered suitable for use by HGVs.

1.4.97 Baseline traffic has been established using ATCs in agreed locations across Lincolnshire. On weekdays a number of the road links have relatively significant proportions of HGVs, for example the A17 Kirkby la Thorpe (15%) and A17 Swineshead (11%). This suggests that the key routes surrounding the proposed converter station are already well used by HGVs and are suitable for continued use.

1.4.98 A CTMP will be implemented to provide mitigation for the HGV movements that occur. This will reduce impacts as far as practicably possible. This will include routeing of movements to avoid sensitive areas (use of A and B-roads only where possible), the use of banksmen when entering/exiting works areas, traffic signalling to ensure continued traffic movements and the implementation of speed limits for construction traffic to reduce the potential for incidents. The programming of HGV movements may also be undertaken in such a way to avoid sensitive periods of the day.

1.4.99 The results of the assessment indicate that impacts at all receptors are likely to be not significant, unless works take place on a Saturday, where some significant effects maybe apparent. However, it is proposed that the majority of HGV movements will take place on weekdays, with Saturdays reserved for traffic movements only if required. Also, works on a Saturday would only constitute a maximum of around 16 % of the total working time during a given week, therefore the impacts would be considered minimal.

Noise & Vibration

Overview

1.4.100 The assessment considered the likely significant effects of noise and vibration generated by the construction and operation of the Scheme.

Proposed DC Cable Route

1.4.101 Although of a temporary nature, construction-related effects have the potential to be significant due to the increase in noise and vibration. Construction work of any type that involves heavy plant activity will generate noise, which may result in complaints if works are not sensitively programmed or appropriately controlled. The noise levels generated by construction activities and experienced by nearby Noise Sensitive Receptors (NSRs), such as residential properties, depends upon a number of variables, including:

- The noise generated by plant or equipment used on site;
- The periods of operation of the plant on the site; and
- The distance between the noise source and the receptor; and

1.4.102 In order to evaluate noise effects during the construction phase it is necessary to have knowledge of the specific activities that will be undertaken and plant which will be used. A complete construction noise and vibration assessment is not normally possible until appointment of a Contractor with knowledge of a precise construction programme and plant schedule.

1.4.103 The assessment has considered the likely construction activities which will be undertaken and proximity of receptors to them. Adopting a cautionary approach it is expected that some moderate adverse (significant) effects will occur, however, these would be short term and temporary occurring within a specific section, not along the full length of the proposed DC route.

1.4.104 To avoid or reduce adverse noise effects mitigation measures will be incorporated within, and implemented through, a CEMP. These will be based on the Best Practicable Means (BPM) for the reduction of noise, such as the use of quieter alternative methods, plant and equipment, acoustic barriers, and portable screens among others. The timing of construction activities will also be scheduled to avoid more sensitive periods (i.e. evenings and nights) where practicably possible.

Proposed Converter Station

1.4.105 The area surrounding the proposed converter station is quiet and rural. Away from the larger roads and conglomerations of houses, representative background noise levels are generally below 30 decibels (dB) L_{A90} (i.e. the sound level that is exceeded by the residual sound for 90% of the time), falling to 22 dB L_{A90} at night. At the more urban fringes and nearer main roads, levels are higher but still relatively low, ranging from 35 dB LA90 during the day, falling to 26 dB LA90 at night. During operation, residential properties within approximately 2 km of the proposed converter station would experience a minor adverse to negligible effect which is not significant.

1.4.106 As with the proposed DC cable route, construction mitigation will be incorporated within the CEMP where BPM will be adopted to reduce noise as far as reasonably practicable. For the construction of the converter station, noise effects are predicted to be minor to moderate adverse during the day and moderate at night (should night works be required). However, very few sensitive receptors (to noise and vibration) are affected.

Cumulative Effects

Overview

1.4.107 The cumulative assessment considered potential impacts from the combined environmental impacts of the different components of the Project (i.e. the UK Offshore Scheme with the UK Onshore Scheme, or the proposed DC cable route with the proposed converter station), and the UK Onshore Scheme in combination with other projects. These are referred to as intra-project and inter-project effects, respectively.

Intra-Project Effects

1.4.108 An intra-project effect on land drainage could result from construction of the Scheme due to a combination of surface and groundwater impacts. Given the large number of watercourses and drains within the vicinity of the Scheme impacts could affect a number of receptors, particularly along the length of the proposed DC route. However these impacts are predicted to be mitigated through the adoption of good construction practices and reinstatement of affected drains, and therefore effects are considered to not be significant.

1.4.109 An intra-project effect on residents, visitors and or recreational users of PRoWs could result from construction of the Scheme due to a combination of noise and visual effects leading to a reduction in amenity. Potential receptors are predominantly residential properties or PRoWs in the vicinity of construction works along the full length of the Scheme. Construction effects from noise are temporary and intermittent, both through the day and the construction period. In contrast, visual effects will be constant throughout the construction period albeit the magnitude of the effect will change as construction progresses due to the differing equipment in use, and extent of temporary change to land cover. Whilst receptors may experience a cumulative reduction in amenity, such effects will be short term, temporary and intermittent and therefore when considered in-combination the significance of effects will not increase. As a result it is

predicted that a small number of receptors in close proximity to the Scheme (typically within less than 0.5 km) will experience intra-project effects moderate adverse intra-project effects adverse which are therefore significant.

1.4.110 Similarly, potential intra-project effects on residents, visitors and or recreational users of PRoWs could results from reduced amenity during the operation of the Scheme from noise and visual impacts. However other than users of the PRoW on North Ing Drove, immediately adjacent to the proposed converter station site would not be significant.

Inter-Project Effects

1.4.111 Screening of projects within the vicinity of the Scheme identified a long list of 66 projects that were known to be proposed or being developed within 1 km of the UK Onshore Scheme. This list was subsequently reduced based on the likelihood of cumulative impacts to occur depending on the type and scale of development, the location of the project in relation to the UK Onshore Scheme and the development phase the project is currently in and whether there was likely to be a temporal overlap. From the long list, a short list of 17 projects was defined, of which two were identified to have potential cumulative impacts on shared receptors with the Scheme; Heckington Fen Wind Farm and Triton Knoll Electrical System.

Heckington Fen Wind Farm

1.4.112 Heckington Feb Wind Farm comprises 22 wind turbines of a maximum height (to blade tip) of 125 m. This project is located to the immediate west of the proposed DC cable route north of the A17. The construction program of the project is unknown following the submission of an amendment to their original consent. The Heckington Fen Wind Farm has been assessed particularly in regard to traffic and transport and landscape and visual cumulative effects. The outcomes of the traffic assessment concluded that the limited number of additional traffic movement required to construct the wind farm (as stated within the Heckington Fen Wind Farm ES) would not result in a significant cumulative impact. The landscape and visual cumulative assessment has assessed the Heckington Fen Wind Farm along with the Triton Knoll Electricity System along with the UK Onshore Scheme. These are assessed in the Triton Knoll assessment in the sub-section below.

Triton Knoll Electrical System

1.4.113 The Triton Knoll Electrical System is the onshore component of the Triton Knoll Offshore Wind Farm, which consists of 288 wind turbines located approximately 32 km from Lincolnshire coast. The onshore component of the project consists of an underground cable connecting the offshore array to the NETS at the existing Bicker Fen 400 kV Substation. The project makes landfall approximately 1.5 km to the south of the proposed landfall site at Boygrift, with the Triton Knoll Electrical System continuing to the southeast, to south of the UK Onshore Scheme, to Bicker Fen Substation. At the closest point the alignment of the Triton Knoll Electrical System and the UK

Onshore Scheme are immediately adjacent as they extend south of the A17, parallel to the South Forty Foot Drain.

1.4.114 Potentially significant cumulative effects may occur as a result of the simultaneous construction of the UK Onshore Scheme and the Triton Knoll Electrical System, as well as the Heckington Fen Wind Farm on the visual amenity of two viewpoints at the southern end of the UK Onshore Scheme, adjacent to the proposed converter station site. These viewpoints are:

- North Ing Drove (Viewpoint (VP) 03) moderate adverse (significant) effect, and
- South Forty Foot Drain, Bank End Farm (VP07) moderate adverse (significant) effect.

Summary of Assessment

1.4.115 Table 29.1 presents a summary of the results of the EIA based on the "worst" effect, that is the most significant, reported for each specialist assessment.

Table 29.1 Summary of Assessment Results (residual effects by topic)

Topic	Proposed DC Cable Route		Proposed Converter Station	
	Temporary	Permanent and Operational	Temporary	Permanent and Operational
Intertidal Zone	X	X	N/A	N/A
Geology & Hydrogeology	X	X	X	X
Water Resources & Hydrology	X	X	X	X
Agriculture & Soils	X	X	X	O
Ecology	X	X	X	X
Landscape	X	X	O	O
Visual Amenity	O	X	O	O
Archaeology & Cultural Heritage	X	O	X	O
Socio-economics & Tourism	X	X	X	O
Traffic & Transport	O	X	X	X
Noise & Vibration	O	X	O	X

Table 29.1 Summary of Assessment Results (residual effects by topic)				
Topic	Proposed DC Cable Route		Proposed Converter Station	
	Temporary	Permanent and Operational	Temporary	Permanent and Operational
Cumulative Effects (Intra-project)	**O**	**X**	**O**	**X**
Cumulative Effects (Inter-project)	**X**	**X**	**O**	**O**

Key: **X** = No significant impacts recorded; **O** = One or more significant impacts recorded

Summary by Local Planning Authority

East Lindsey District Council

1.4.116 Within ELDC's administrative area residual environmental effects relate to construction of the proposed DC cable route only. All effects are considered to be temporary and short term occurring for the duration of construction works only. Potentially significant environmental effects have been assessed on:

- Visual amenity from viewpoint 3 which is representative of receptors on the edge of Salesby;
- Up to 11 sites on road links as a result of construction traffic during weekdays and 17 sites on road links during weekends; and
- On some residential properties which are in close proximity to the proposed DC route as a result of construction noise.

Boston Borough District Council

1.4.117 Within BBC's administrative area residual environmental effects relate to construction of the proposed DC and AC cable routes. All effects are considered to be temporary and short term occurring for the duration of construction works only. Potentially significant environmental effects have been assessed on:

- Landscape character as a result construction of the proposed AC cable route.
- Road links within BBC as a result of construction traffic.
- On some residential properties which are in close proximity to the proposed DC route as a result of construction noise.

North Kesteven District Council

1.4.118 Within BBC's administrative area residual environmental effects relate to construction of the proposed DC cable route. All effects are considered to be temporary and short term occurring for the duration of construction works only. Potentially significant environmental effects have been assessed on:

- Road links within BBC as a result of construction traffic.
- On some residential properties which are in close proximity to the proposed DC route as a result of construction noise.

South Holland District Council

1.4.119 Within SHDC's administrative area residual environmental effects relate to construction of the proposed DC cable route as well as the proposed converter station and permanent access road. Temporary and permanent effects are predicted within SHDC. Potentially significant environmental effects have been assessed:

- On some residential properties which are in close proximity to the proposed DC route as a result of construction noise.
- On heritage receptors within the proposed converter station site which would be permanently affected.
- On BMV agricultural land within the proposed converter station site which would be permanently replaced.
- On PRoWs which may require to be stopped up as result of securing the permanent access road.
- On visual amenity both during construction and operation from a number of viewpoints which are considered representative of residents and recreational users of PRoWs.
- On landscape character during construction and operation as a result of the proposed converter station.

Summary of Assessment

1.4.120 Table 29.2 presents a summary of the results of the EIA based on the "worst" effect, that is the most significant, reported for each specialist assessment.

Table 29.2 Summary of Assessment Results (residual effects by Local Planning Authority)

Local Planning Authority		Temporary	Permanent and Operational
East Lindsey District Council	For the installation of approximately 51.60 km of proposed underground DC cable, and associated temporary works.	O	X
Boston Borough Council	For the installation of approximately 9.78 km of proposed underground DC cable, approximately 1.13 km of proposed AC underground cable, and associated temporary works.	O	X

Table 29.2 Summary of Assessment Results (residual effects by Local Planning Authority)			
Local Planning Authority		**Temporary**	**Permanent and Operational**
North Kesteven District Council	For the installation of approximately 4.80 km of proposed underground DC cable, and associated temporary works.	**O**	**X**
South Holland District Council	For the proposed converter station, 2.8 km long permanent access road, approximately 0.98 km of proposed underground DC cable, approximately 1.21 km of proposed AC underground cable, and all associated temporary works.	**O**	**O**

Key: **X** = No significant effects predicted; **O** = One or more significant effects predicted

2 Conclusions

2.1.1 The results of the EIA ensure that the LPAs and statutory consultees as well as other interested parties including local communities are aware of the Scheme's environmental impacts and whether these may be significant or not. It is important to note that a significant adverse effect is not necessarily one that would make the UK Onshore Scheme unacceptable, nor is a significant beneficial effect necessarily one that would make the Scheme acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties are aware of the Scheme's environmental impacts (in particular those which are likely to be significant) so that they may be considered alongside other material considerations in determining the applications for planning permission.

2.1.2 The EIA of the UK Onshore Scheme has identified and assessed the likely significant effects which would result from its construction and operation. Through careful siting and routeing as well as embedding mitigation within the base scheme design, National Grid Viking Link Limited (NGVL), the applicant, has prevented or reduced a number of potentially significant environmental effects. However, given the scale of the Scheme some significant environmental effects are unavoidable and as such some will remain following mitigation. As set out above, the majority of significant environmental effects will occur during construction of the Scheme and whilst significant they will be temporary lasting for the duration of construction works only. Where significant environmental effects are predicted to be permanent these relate to above ground components of the Scheme only (the proposed converter station and the permanent access road).

2.1.3 The proposed DC cable route is not predicted to result in significant environmental effects in the long term. Significant environmental effects are predicted to occur during construction only. This includes effects on residents and visitors in proximity of the proposed DC cable route who may experience significant noise and/or visual effects as well as some roads which will be used during construction where predicted increases in traffic flows as a result of construction traffic are likely to be significant. However, it should be noted that whilst some significant environmental effects are predicted these will not occur along the full length of the proposed route for the full duration of construction but rather for short periods of time whilst the proposed route is constructed in sections.

2.1.4 The proposed converter station is predicted to result in temporary and permanent significant environmental effects. Temporary significant effects are predicted on landscape character and visual amenity in the immediate vicinity as result of construction activity. Permanent effects on landscape character and visual amenity have been mitigated as far as possible through the inclusion of landscape planting within the base scheme design including extensive tree planting

around the perimeter of the proposed site, however, significant effects will remain. Permanent significant effects are also predicted as a result of:

- Physical impacts on heritage receptors within the proposed converter station site; these have been mitigated as far as possible through commitments to pre-construction investigation and recording of heritage receptors.
- The permanent loss of BMV agricultural land as a result of the proposed converter station's permanent land take. Whilst over 20 ha will be lost the assessment notes a considerable amount of land in the region is classed as BMV.
- The permanent impact on a PRoW which crosses the permanent access road. Whilst usage of the PRoW is low in the worst case this it would be stopped up and with a permanent diversion provided to offset this.

2.1.5 NGVL has incorporated the majority of mitigation measures within the base scheme design for which planning permission is being sought as well as committed to the implementation of various measures during construction. Should planning permission for the Scheme be granted NGVL are committed to working with their appointed Contractor(s) to reduce the Scheme's environmental effects as far as practicable in finalising the detailed scheme design and undertaking construction works. This approach will ensure that the actual effects of the Scheme would be no greater than the likely effects identified and assessed in this ES.

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