FOREWIND

DOGGER BANK
TEESSIDE A & B

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2014

Environmental Statement
Chapter 25
Terrestrial Ecology

Application Reference: 6.25

Cover photograph: Indicative image showing installation of meteorological mast within the Dogger Bank Zone

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1 Introduction

1.1 Background

1.1.1 This chapter of the Environmental Statement (ES) assesses the potential impact of Dogger Bank Teesside A & B on the existing onshore environment with regard to terrestrial ecology during the construction, operation and decommissioning phases. Where the potential for impacts is identified, mitigation measures and residual impacts are presented.

1.1.2 It should be noted that the project also has the potential to impact on marine and coastal ecology including ornithology and marine mammals. These impacts are covered in **Chapter 11 Marine and Coastal Ornithology**, **Chapter 12 Marine and Intertidal Ecology**, **Chapter 13 Fish and Shellfish Ecology** and **Chapter 14 Marine Mammals**.

2 Guidance and Consultation

2.1 Policy and guidance

National Policy Statements

2.1.1 The assessment of potential impacts upon terrestrial ecology has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision making documents for Nationally Significant Infrastructure Projects (NSIP). Those relevant to Dogger Bank Teesside A & B are:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b); and
- NPS for Electricity Networks Infrastructure (EN-5) (DECC 2011c).

2.1.2 The specific assessment requirements for terrestrial ecology, as detailed in the NPSs, are summarised in **Table 2.1**, together with an indication of the paragraph numbers of the ES chapter where each is addressed. Where any part of the NPS has not been followed within the assessment an explanation as to why the requirement was not deemed relevant, or has been met in another manner, is provided.

Table 2.1 NPS assessment requirements

NPS requirements	NPS reference	ES reference
Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity	EN-1 Section 5.3.3	Sections 6, 7 and 8
The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests	EN-1 Section 5.3.4	Section 6
The applicant should include appropriate mitigation measures as an integral part of the proposed development. In particular, the applicant should demonstrate that: • During construction, they will seek to ensure that activities will be confined to the minimum areas required for the works; • During construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements; • Habitats will, where practicable, be restored after construction works have finished; and • Opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals.	EN-1 Section 5.3.18	Section 6

2.2 Other legislation, standards and guidance

2.2.1 The ecological assessment was undertaken with reference to the following legislation and guidance documents:

- Conservation of Habitats and Species Regulations 2010 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- Protection of Badgers Act 1992;
- Natural Environment and Rural Communities (NERC) Act 2006;
- The Hedgerow Regulations 1997;
- UK Post-2010 Biodiversity Action Framework (which supersedes the UK Biodiversity Action Plan);
- Tees Valley Local Biodiversity Action Plan (LBAP);
- The Redcar and Cleveland Borough Council Adopted Development Plan; and
- Guidelines for Ecological Impact Assessment in the United Kingdom (Institute for Ecology and Environmental Management (IEEM)) 2006.

2.3 Consultation

2.3.1 To inform the ES, Forewind has undertaken a thorough pre-application consultation process, including the following key stages:

- Scoping Report submitted to the Planning Inspectorate (May 2012);
- Scoping Opinion received from the Planning Inspectorate (June 2012);
- First stage of statutory consultation (in accordance with sections 42 and 47 of the Planning Act 2008) on Preliminary Environmental Information (PEI) 1 (report published May 2012); and
- Second stage of statutory consultation (in accordance with sections 42, 47 and 48 of the Planning Act 2008) on the ES (published November 2013) designed to allow for comments before final application to the Planning Inspectorate).

2.3.2 In addition, consultation associated with the Dogger Bank Creyke Beck application (Forewind August 2013) has been-taken into account for Dogger Bank Teesside A & B where appropriate.

2.3.3 In between the statutory consultation periods, Forewind consulted specific groups of stakeholders on a non-statutory basis to ensure that they had an opportunity to inform and influence the development proposals. Consultation undertaken throughout the pre-application development phase has informed Forewind's design decision making and the information presented in this application. Further information on the consultation process is presented in **Chapter 7 Consultation**. A Consultation Report is also provided alongside this ES as part of the overall planning submission.

2.3.4 A summary of the consultation carried out at key stages throughout the project, of particular relevance to Terrestrial Ecology, is presented in **Table 2.2**. This

table only includes the key items of consultation that have defined the assessment. A considerable number of comments, issues and concerns raised during consultation have been addressed during consultation meetings and hence have not resulted in changes to the content of the ES. In these cases, the issue in question has not been captured in **Table 2.2**. A full explanation of how the consultation process has shaped the ES, as well as tables of all responses received during the statutory consultation periods, is provided in the Consultation Report.

Table 2.2 Summary of consultation and issues raised by consultees

Date	Consultee	Summary of issue	ES reference
February 2012 (Non-statutory)	Natural England	Natural England provided written acceptance of the 'Ecological Scope of Works' outlining the proposed survey methodologies and extents for Dogger Bank Teesside. The decision to split the development into two different applications was made after the submission of the scope of works. More details can be found in **Chapter 7 Consultation**.	Approved methodologies and survey areas were implemented during baseline data collection. See Section 3.
February 2012 (Non-statutory)	Natural England	Recommendation for consultation to be undertaken with the Royal Society for the Protection of Birds (RSPB), British Trust for Ornithology (BTO) and the Tees Valley Wildlife Trust.	Consultation undertaken with all and comments incorporated where appropriate.
April 2012 (Non-statutory)	Natural England, RSPB, Teesmouth Bird Club, Industry Nature Conservation Association (INCA) & Tees Valley Wildlife Trust	Ecology Workshop held on 3 April 2012 to introduce proposed approach to ecological studies. Consultees approved the ecological methodologies.	Approved methodologies were implemented during baseline data collection. See Section 3.
May 2012 (Scoping Opinion)	Durham Bat Group	Comment on bat legislation and the possibility of migratory bats across the North Sea. Requested a copy of the EIA and expected all surveys to be undertaken following the Bat Conservation Trust (BCT) guidelines and by suitably qualified and licensed ecologists.	Bat surveys all undertaken by suitably qualified and licensed ecologists and in accordance with BCT guidelines, see Section 4.4.
June 2012 (Scoping Opinion)	North Yorkshire County Council	Cumulative impacts require consideration for onshore and offshore and thorough assessment of both the onshore and offshore ecological impacts (in particular the impacts upon marine ecology, including nationally important sea bird populations).	Cumulative impacts for onshore considered in Section 10. Offshore cumulative impacts in relation to ornithology are covered in **Chapter 11 Marine and Coastal Ornithology**.
June 2012 (Scoping Opinion)	Tees Valley Wildlife Trust	Satisfied with the approach taken and the options presented (landfall and converter station). Beach in this area is locally important (and designated as a Local Wildlife Site (LWS)), (also known as Grundales) are designated as locally	Impacts on designated sites have been considered within this assessment in Section 6. Designated sites are also considered in

Date	Consultee	Summary of issue	ES reference
		important coastal grasslands.	**Chapter 8 Designated Sites**.
June 2012 (Scoping Opinion)	Joint Nature Conservation Committee & Natural England	Consider the likelihood that the proposal will have a significant effect on internationally designated sites and therefore will require assessment under the Habitats Regulations. Full consideration of impacts on habitats and species, including: Historical survey data; Status of habitats and species; Development effects; and Mitigation or compensation details. Ornithological studies should include surveys of wintering, breeding and passage species which are qualifying features of the Special Protection Area (SPA), and impacts including direct habitat loss, displacement and disturbance should be considered. Inter-relationships - to take an ecosystem approach and consider inter-relationships when looking at impacts.	Assessment will be undertaken as part of the Habitats Regulation Assessment (HRA), and at this stage, a screening report has been produced. Impacts on all appropriate ecological receptors has been undertaken and reported within the ES. Two years wintering bird data and one year passage and migration data has been obtained. See also **Chapter 11 Marine and Coastal Ornithology**.
June 2012 (Scoping Opinion)	North York Moors National Park	The EIA should address the issue of whether the wind farm is likely to affect the feeding patterns of seabirds which nest along the coastal cliffs and makeup part of the diverse ecology of the National Park natural environment.	Impacts to coastal breeding birds will be avoided through the use of Horizontal Directional Drilling (HDD), in addition to a suite of mitigation measures to minimise disturbance to seabirds during construction. See Section 6.3 and **Chapter 5 Project Description**.
February 2013 (Non-statutory)	Natural England	Confirmed that survey data for ecological surveys is valid for up to 3 years barring any significant landscape changes. They also confirmed that wintering bird surveys are valid for up to 5 years, excluding significant landscape changes.	N/A
May 2013 (Non-statutory)	Hartlepool Borough Council, Redcar and Cleveland Borough Council (RCBC) Teesmouth Bird Club, Durham Bat Group & North East of England Reptile and Amphibian Group	Terrestrial Ecology Workshop held on 15th May 2013. The purpose of the meeting was to introduce Forewind Ltd to consultees and update them on the ecological surveys and results to date, and to gain input from consultees into the ongoing project design. The meeting highlighted a number of key points for terrestrial ecology including that the landfall field (known as 'Grundales') is	N/A

Date	Consultee	Summary of issue	ES reference
		a key area of importance wintering birds; key wintering bird mitigation will be avoidance of construction activities over the wintering period; an active badger sett is present in the Wilton Complex, (which was deemed to be sufficiently far away not to be impacted by Dogger Bank Teesside A & B); and the consideration of geographical scales to define levels of impacts. General consensus reached as a result of the meeting was that a sensible approach had been employed to ensure appropriate coverage of all potential ecology issues at the site.	
August 2013 (Non-statutory)	Teesmouth Bird Club	The club is in agreement with the anticipated impacts on ornithology. They assume that planting failures will be replaced in the following season and that appropriate construction practices will be followed in relation to minimising the risk of spreading invasive weed species.	Construction will follow an agreed Environmental Management Plan. Management of the landscape planting will be devised in agreement with the landowners and RCBC (**Chapter 21 Landscape and Visual Impact Assessment**).
August 2013 (Non-statutory)	RSPB	The RSPB is in support of the mitigation proposals and would like consultation with the Tees Valley Wildlife Trust in advance of works taking place and supervision by an ECW of key areas of works. The exclusion zone for active nest (if found during clearance) will depend on species sensitivity.	Mitigation measures have been committed to in relation to wintering birds (Section 6.4).
December 2013 (Statutory)	Natural England	Designated sites: Natural England is in agreement with the assessment of impacts on designated sites and would advise the use of HDD to avoid impacts on the Redcar to Saltburn Coast LWS. Protected species: Natural England consider that the mitigation measures with regard to bats, breeding birds, otter and badger are appropriate. Wintering birds: Natural England has concerns over wintering birds on the coastal fields at the landfall and notes that large numbers of golden plover were using the coastal fields in November and December. Concerns remain regarding the number of golden plover (and lapwing) remaining during January to March since numbers fluctuate between survey years. Further information is required to support	Information on designated sites within the study area is provided in Section 4.1 with impacts considered in Section 6.2. Mitigation measures for protected species have been committed to (see Section 6.4 & 6.5). Wintering birds: an additional desk study and survey was undertaken for golden plover and lapwing in 2014. See Sections 4.6 and 6.4.

Date	Consultee	Summary of issue	ES reference
		mitigation proposals.	
December 2013 (Statutory)	RCBC	The Council stated they did not have an in house ecologist and therefore were not in a position to provide a detailed response with regard to ecology. They stated that advice be taken from the statutory consultees including Natural England and the RSPB, as well as more local information sources such as Tees Valley Wildlife Trust.	N/A
December 2013 (Statutory)	The Forestry Commission	No further comments to provide, as no ancient woodland has been identified within the study area.	N/A
December 2013 (Statutory)	Tees Valley Wildlife Trust	No onshore comments were made at this stage, response focussed on offshore issues only.	N/A
December 2013 (Statutory)	RSPB	No onshore comments were made at this stage, response focussed on offshore issues only.	N/A
February 2014 (Non – statutory)	Natural England	Discussion with Natural England regarding wintering bird survey results from 2014 and proposed impacts and mitigation, in response to draft ES comments.	Wintering birds: an additional desk study and survey was undertaken for golden plover and lapwing in 2014. See Sections 4.6 and 6.4.
February 2014 (Non – statutory)	Natural England	Response from Natural England following submission of wintering bird desk study and 2014 survey results. Natural England advised that, in the interests of best practice and minimising the risk of disturbance, works to the landfall, in the coastal fields are avoided from October to February inclusive. Work should also be avoided during March in the event of prolonged periods of freezing weather.	Forewind acknowledge response received from Natural England regarding timing of landfall works at the coastal fields. Forewind propose proportionate mitigation measures will be implemented during the autumn/winter months at this location, and these are listed in **Table 6.4**.

3 Methodology

3.1 Study area

3.1.1 The study area for individual species and species groups varied for a number of reasons, typically relating to species ecology. The typical study area for the baseline surveys comprised a 1km wide cable and converter station corridor. This encompassed a 500m buffer either side of a provisional cable route and around land identified as the study area for potential converter stations site. Given the iterative, on-going nature of project design, the cable route has been subject to minor alterations throughout the baseline data collection process. However, the extent of the original surveys was sufficient to accommodate those alterations and to ensure that the survey data taken forward within this assessment is a valid dataset.

3.1.2 A summary of the study areas defined for each set of surveys/studies is provided in **Table 3.1**.

Table 3.1 Summary of ecological study areas

Survey	Survey Area	Reference
Statutory designated sites	Initial search for all sites within 5km of cable route centre line and converter stations site	**Figure 4.1**
Species of Principal Importance* and non-statutory designated sites**	1km either side of cable route corridor and converter stations for all non-statutory designated sites and species records, extended to 5km for bat records	**Figure 4.2** **Figure 4.10 – Figure 4.14** **Figure 4.15 – Figure 4.18** **Figure 4.19 – Figure 4.22** **Figure 4.16**
Extended Phase habitat survey	1km wide cable and converter station corridor	**Figure 4.3 – Figure 4.9**
Hedgerow survey	1km wide cable and converter station corridor	**Figure 4.3 – Figure 4.9**
Breeding birds survey	Three transects within the 1km wide cable corridor between Marske-by-the-Sea and Yearby, Yearby and Wilton and around existing National Grid Electricity Transmission (NGET) substation at Lackenby	**Figure 4.15 – Figure 4.18**
Autumn passage birds survey	Two areas within the 1km wide cable corridor including between Marske-by-the-Sea and Redcar and inland fields between Yearby and Wilton	**Figure 4.19 – Figure 4.21**
Winter birds survey	2014: one area: coastal fields at the landfall between Redcar and Marske-by-the-Sea 2012/2013: two areas: transect between Redcar and Marske-by-the-Sea and inland fields between Yearby and Wilton 2011/2012: four 1km^2 survey squares at Saltburn-by-the-Sea, Marske-by-the-Sea,	**Figure 4.19 – Figure 4.21**

Survey	Survey Area	Reference
	Warrenby and Teesport (reduced to two areas for 2012 - 2013 surveys after landfall options refinement)	
Great crested newt survey	Ponds and ditches within 250m of the cable route and converter stations site	**Figure 4.22**
Riparian mammals survey	Watercourses within 250m of the cable route and converter stations site	**Figure 4.14**
Bat surveys	Three transects within the 1km cable corridor between the landfall and Grewgrass Farm, around Yearby and around the Wilton Complex	**Figure 4.10 – Figure 4.13**
Reptile surveys	Eight areas selected within the 500m buffer centred on the cable route centre line and converter stations site	**Figure 4.22**

* Species of Principal Importance includes legally protected species, species listed on Section 41 of NERC Act 2006 or the Tees Valley LBAP or UK BAP (Joint Nature Conservation Committee, 2008) (the priority species remain the same following the 2010 review).
** Non-statutory designated sites do not receive legal protection. They typically contain the best examples of wildlife habitats or rare species remaining in Teesside and are important in complementing the SSSI framework. They are typically selected within a local authority area and often managed by the local Wildlife Trust.

3.2 Characterisation of existing environment

3.2.1 Characterisation of the existing environment has been informed through a desk based study of available data, and information from the consultation process. The following sources of information have been used:

- Peak Ecology (2013). Ecological Impact Assessment Technical Report. Dogger Bank Teesside A & B (**Appendix 25A**);
- Peak Ecology (2013c). Extended Phase I Habitat Survey Technical Report. Dogger Bank Teesside A & B Onshore Electrical Connection;
- Peak Ecology (2013b). Bat Survey Technical Report. Dogger Bank Teesside A & B Onshore Electrical Connection;
- Peak Ecology (2013e). Riparian Mammal Survey Technical Report. Dogger Bank Teesside A & B Onshore Electrical Connection;
- Peak Ecology (2012). Breeding Bird Survey 2012, Technical Report. Dogger Bank, Teesside A & B, Onshore Electrical Connection;
- Peak Ecology (2013a). Wintering Bird Survey, November 2011 – March 2012, Technical Report. Dogger Bank Teesside A & B Onshore Electrical Connection;
- Peak Ecology (2013g). Autumn Passage and Wintering Birds September 2012 – March 2013 Technical Report Dogger Bank Teesside Project A & B, Onshore Electrical Connection;
- Peak Ecology (2013d). Great crested newt survey Technical Report. Dogger Bank Teesside A & B Onshore Electrical Connection; and
- Peak Ecology (2013f). Reptile Survey Technical Report. Dogger Bank Teesside A & B Onshore Electrical Connection;

- Peak Ecology (2014a). Golden Plover and Lapwing – desk based assessment and additional field surveys Dogger Bank Teesside A & B Onshore Electrical Connection.

3.3 Assessment of impacts

Introduction

3.3.1 The ecological impact assessment (EcIA) has been undertaken with reference to current best practice and in particular IEEM Guidelines 2006. The guidelines aim to predict the residual impacts on important ecological features that may be affected by the development either directly or indirectly, once all mitigation has been implemented.

Value (sensitivity)

3.3.2 The first stage of an EcIA is to determine which ecological receptors within the site are both of sufficient value to be included in the assessment and vulnerable to significant impacts arising from the proposed development (IEEM 2006). It is suggested that only Valued Ecological Resources (VERs) which might be impacted upon significantly are considered. The approach aims to avoid describing or quantifying effects which might not be significant for example if they affect receptors of low or little value.

3.3.3 In terms of identifying VERs, this might include sites, habitats, species or combination features and the values applied to the VER are within a defined geographical context, typically from 'International' down to 'within the zone of influence'. With regard to Dogger Bank Teesside A & B, the geographical scale and examples has been interpreted as presented in **Table 3.2**.

Table 3.2 Evaluation of ecological value – an interpretation of the EcIA Guidelines Geographical Scale of Importance for Dogger Bank Teesside A & B

Geographical scale from guidelines	Interpretation	Examples
International	International	Internationally designated site or candidate site or an area which meets published selection criteria for such designation.
National (i.e. England/Northern Ireland/Scotland/Wales)	England	Nationally designated site or area, or an area which meets published selection criteria for such designation. Nationally significant population/number of any internationally important species.
Regional	North East Yorkshire	Areas of ancient woodlands, large areas of priority BAP habitat, locally significant number of a regionally important species.
County (or Metropolitan - e.g. in London)	Redcar and Cleveland	Local Nature Reserves or non-statutory designated sites (LWS), viable areas of LBAP habitat.
Local or Parish	Cable corridor, including wider areas at the converter stations and landfall locations.	Significant ecological features such as old hedgerows, small woodlands or ponds. Common species legally protected primarily for animal welfare reasons (e.g. badgers).

Geographical scale from guidelines	Interpretation	Examples
Within zone of influence only (which might be the project site or a larger area).	As above*	As above.

* Given that this onshore electrical connection covers a (realistic worst case) linear distance of approximately 12km and an area of approximately 4km^2 of land, it cuts across several 'localities' or parishes. It seems appropriate to merge the 'Local or Parish' and 'within zone of influence only' geographical scales, hereafter referred to as 'Local'.

3.3.4 It should be noted that it is usual to consider habitats and species together when ascribing a value to a feature using this geographic context. However, there are circumstances where it may be necessary to assign a value to a particularly valuable species. In assigning value to species it is necessary to consider the species distribution and status including a consideration of trends based on available historical records and to make use of any relevant published evaluation criteria. Legal protection should be considered separately from ecological value. For example, a very small population of the European Protected Species great crested newt *Triturus cristatus* should not be valued the same as a very large population.

Criteria for assessing effects

3.3.5 Once VERs have been identified, it is necessary also to identify the activities likely to cause significant impacts, to describe the resultant changes and to assess the impacts on the VERs. Again, the emphasis is on focusing on likely significant impacts on VERs.

3.3.6 Once the VERs have been identified, the next stage of the assessment is to consider the potential impacts of the proposed development, taking into account both on-site impacts and those that may occur to adjacent or more distant ecological features. Impacts can be positive or negative. Impacts can be permanent or temporary, direct or indirect and can include:

- Direct loss of wildlife habitats;
- Fragmentation and isolation of habitats;
- Disturbance to species from noise, light or other stimuli during construction, operation or decommissioning;
- Changes to key habitat features;
- Killing/injury to a species; and
- Changes to the local hydrology, water quality and/or air quality.

3.3.7 When describing changes/activities and impacts on ecosystem structure and function, the guidelines recommend that reference should be made to the following parameters:

- Whether the change will be positive or negative;
- Duration – the time for which the impact will last prior to recovery or replacement of the feature or resource e.g. disturbance to birds during their breeding season may result in failure to reproduce in that area during the whole season;

- Reversibility – whether the impact is permanent or temporary. A reversible (temporary) impact is one from which spontaneous regeneration is possible, or for which mitigation is effective; and
- Timing/frequency – some changes will only cause an impact if they coincide with a critical season (e.g. nesting bird season) or are repeated, e.g. compare the effect of a single dog walker and the limited disturbance to feeding waders to numerous dog walkers frequently disturbing affecting their feeding success.

3.3.8 The magnitude of the effect should also be considered, which refers to the 'size' or 'amount' of an effect, determined on a quantitative basis if possible. A description of magnitude of effect is presented in **Table 3.3**.

Table 3.3 Magnitude of effect

Magnitude	Description
High	Complete loss of, permanent damage to/degradation of, or long-term disruption to physical status, dynamics or function of the receptor; Loss of receptor integrity or favourable conservation status.
Medium	Partial loss of, temporary damage to or medium-term disruption to physical status, dynamics or function of the receptor; A substation reduction in a receptor such that there is no loss of favourable conservation status but the receptor is significantly more vulnerable.
Low	Temporary, short-term disturbance to the physical status, dynamics or function of the receptor; A reduction in the receptor integrity, but no significant habitat loss or reduction in favourable conservation status.
Negligible	No impacts on sites of international, national or county importance No reduction in the receptor integrity or favourable conservation status.

3.3.9 Additionally, IEEM (2006) suggest it important to consider the likelihood that a change/activity will occur as predicted and to quantify the degree of confidence in the impact assessment presented. The following model is given as an example:

- Certain/near-Certain: probability estimated at 95% chance or higher;
- Probable: probability estimated above 50% but below 95%;
- Unlikely: probability estimated above 5% but less than 50%; and
- Extremely Unlikely: probability estimated at less than 5%.

Assessment of impact significance

3.3.10 An ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area. Impacts are unlikely to be significant where features of local value or sensitivity are subject to small scale or short-term impacts. If an impact is found not to be significant at the level at which the resource or feature has been valued, it may be significant at a more local level.

3.3.11 The integrity of 'defined' sites is described as follows and has been used in this assessment to determine whether the impacts of the proposals on a designated site are likely to be significant:

"The integrity of a site is the coherence of its ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified (IEEM 2006)".

3.3.12 The conservation status of habitats and species within a defined geographical area is described as follows and has been used in this assessment to determine whether the impacts of the proposals on non-designated habitats and species are likely to be significant:

"For habitats, conservation status is determined by the sum of influences acting on the habitat and its typical species, that may affect its long term distribution, structure and functions as well as the long term survival of its typical species within a given geographical area;

For species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long term distribution and abundance of its population within a given geographical area (IEEM 2006)".

3.3.13 For the purpose of this EcIA, significant positive or negative impacts have been subdivided to include major, moderate and minor impacts. These subdivisions scale impacts according to the nature conservation value of the feature being assessed and the magnitude or scale of the impact. This then makes it compatible with the other chapters. The definition of the significance levels is provided as a guide in **Table 3.4**.

Table 3.4 Significance of impacts

Significance	Description
Major adverse	Impact is large-scale giving rise to substantial concern. The change is likely to cause a permanent negative effect on the receptor. It should be considered unacceptable and requires compensating or a significant change to the development if no alternative is available.
Moderate adverse	The impact gives rise to some concern but is tolerable in the short-term or there is considered to be a lower risk of the event occurring at all.
Minor adverse	The impact is small, being undesirable but acceptable or there is considered to be a low risk of the event occurring at all.
Negligible	The impact is sufficiently small as to be indeterminable and of no concern or there is considered to be almost no risk of the event occurring at all.
Minor beneficial	The impact is sufficiently small and of slight significance providing some benefit to the environment.
Moderate beneficial	The impact provides a positive environmental gain.
Major beneficial	The benefit is large-scale providing a significant positive environmental gain. The change is likely to cause a permanent beneficial effect on the receptor.

3.3.14 The assessment of potential impacts and significance is considered with the inclusion of embedded mitigation (Section 6.1). The assessment has been made based on residual effects, i.e. the significance of the effects that are predicted after the implementation of all mitigation.

3.3.15 In addition to determining the significance of the impacts on VER, this EcIA also identifies any additional legal requirements for mitigation measures.

4 Existing Environment

4.1 Introduction

4.1.1 This section describes the existing environment in relation to terrestrial ecology. It is based on a desk-based study of existing sources and targeted surveys and provides the basis for the impact assessment.

4.2 Designated sites

Statutory designated sites

4.2.1 There are nine statutory designated sites within the 5km study area (**Table 4.1**). This includes the Teesmouth and Cleveland Coast SPA and Ramsar site, five Sites of Special Scientific Interest (SSSI) (South Gare and Coatham Sands SSSI, Saltburn Gill SSSI, Lovell Hill Pools SSSI, Redcar Rocks SSSI, Tees and Hartlepool Foreshore and Wetlands SSSI) and two Local Nature Reserves (LNRs) (Guisborough Branch Walkway LNR and Flatts Lane Woodland Country Park LNR). These sites are also shown on **Figure 4.1**.

4.2.2 None of the statutory designated sites fall within the cable route or converter stations corridor. The closest site is the Lovell Hill Pools SSSI which is just over 2km south at its closest point.

4.2.3 None of the sites are linked in any way to the proposed works areas and therefore no impacts are anticipated on any statutory designated sites. The statutory designated sites will not be considered further within this assessment.

Non-statutory designated sites

4.2.4 There are two LWSs within the 1km study area: Redcar to Saltburn Coast LWS and Wilton Woods Complex LWS (**Table 4.2** and **Figure 4.2**).

4.2.5 The closest site is the Redcar to Saltburn Coast LWS which falls within the boundary of the study area (61.5ha of the LWS falls within the study area) and is crossed by the cable route. This site has been included for assessment purposes.

4.2.6 No impacts are considered likely on the Wilton Woods Complex LWS since it is not linked to the proposed works areas and therefore it is not included for any further assessment.

Table 4.1 Statutory designated sites

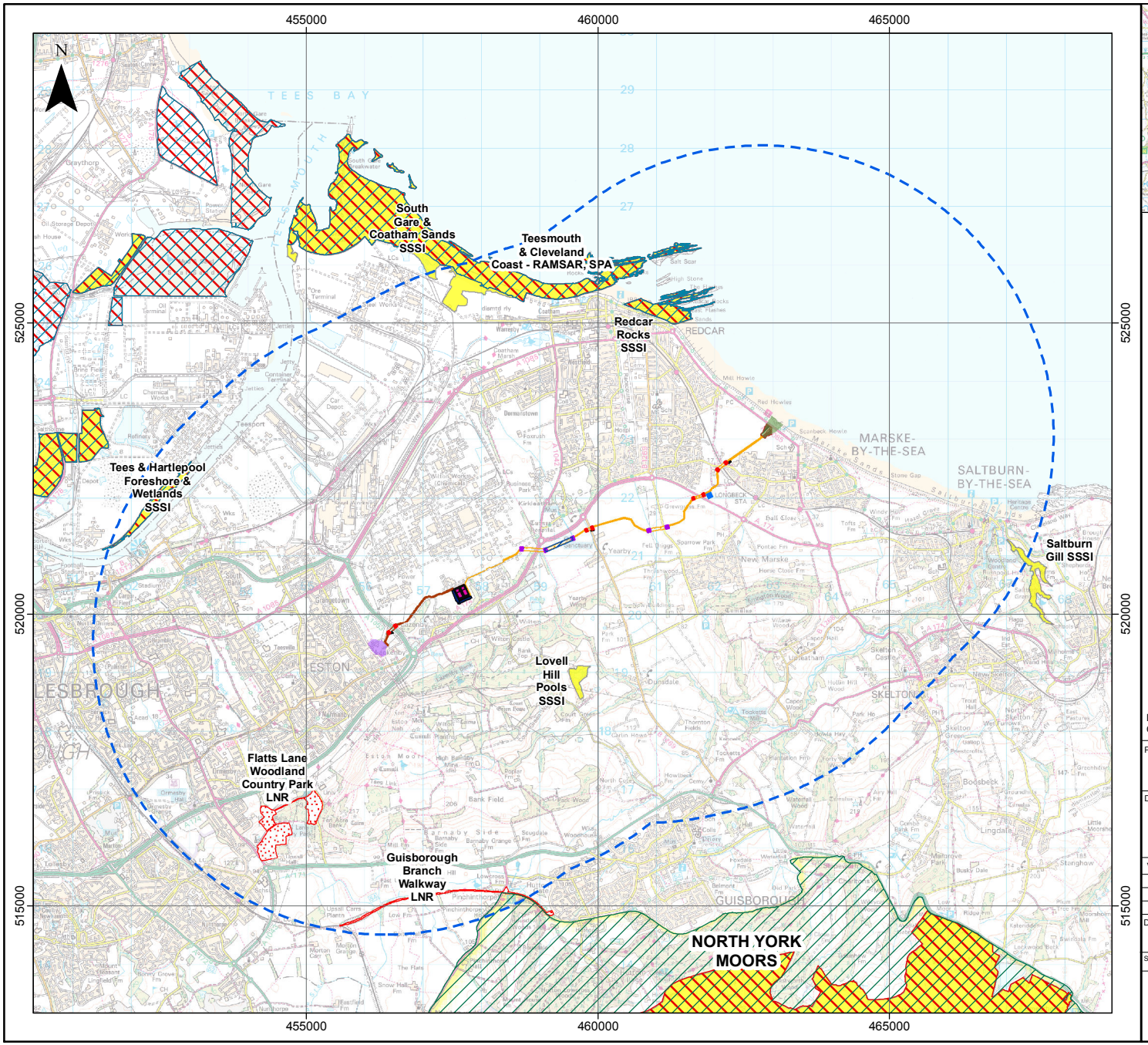
Site name	Designation	Brief description*	Grid reference	Distance (km) and direction	Total area (ha)/ area within study area
Teesmouth & Cleveland Coast	Ramsar	An estuarine complex of intertidal sand and mudflats, rocky shore, saltmarsh, freshwater marsh and sand dunes. The site supports a rich assemblage of invertebrates, including seven Red Data Book species. The estuary is also an important spring and/or autumn staging area for migratory waterbirds.	NZ587257	3.5 NW	1250.4/160.4
Teesmouth & Cleveland Coast	SPA	During the breeding season the area regularly supports: little tern *Sterna albifrons*. On passage the area regularly supports: Sandwich tern *Sterna sandvicensis* and over winter the area regularly supports red knot *Calidris canutus* and on passage supports common redshank *Tringa totanus*.	NZ587257	3.5 NW	1250.4/160.4
South Gare & Coatham Sands	SSSI	The site is of considerable interest for its flora, invertebrate fauna and birdlife. The range of habitats present includes extensive tracts of intertidal mud and sand, sand dunes, saltmarsh and freshwater marsh.	NZ579258	3.5 NW	396.3/137.9
Saltburn Gill	SSSI	Steep sided coastal dene, incised into glacial clays, shales and sandstones of the Lower Jurassic period. The site comprises the eastern slopes of the gill which are of particular importance in supporting one of the few relatively undisturbed areas of mixed deciduous woodland in Cleveland.	NZ674205	4.3 SE	20.0/20.0
Lovell Hill Pools	SSSI	The site supports an outstanding assemblage of dragonflies and damselflies. The pools and surrounding habitats also support populations of both great crested newt and smooth newt *Triturus vulgaris.*	NZ596189	1.9 S	9.7/9.7
Redcar Rocks	SSSI	An important feeding ground for several species of wading birds e.g. knot, turnstone *Arenaria interpres*, sanderling *Calidris alba* and purple sandpiper *Calidris maritima*, especially during the winter months.	NZ611252	2.2 NW	30.2/30.2
Tees & Hartlepool Foreshore & Wetlands	SSSI	Several coastal areas which are an integral part of the complex of wetlands, estuarine and maritime sites supporting the internationally important population of wildfowl and waders on the Tees Estuary. Saltholme and Dorman's Pools and Haverton Hole support a nationally important assemblage of breeding birds.	NZ524220	4.3 NW	245.3/20.1
Guisborough Branch Walkway	LNR	A two and a half mile walkway along the former railway line containing a variety of habitats including wetland, farmland and woodland.	NZ573152	4.0 S	8.3/6.9

Site name	Designation	Brief description*	Grid reference	Distance (km) and direction	Total area (ha)/ area within study area
Flatts Lane Woodland Country Park	LNR	An urban fringe wildlife site with areas of grassland and scattered ponds.	NZ551168	2.5 SW	40.9/40.9

* Each brief description is taken from the original Natural England citation website found at http://www.naturalengland.org.uk/

Table 4.2 Non-statutory designated sites

Site Name	Brief description	Grid Reference	Distance (km) and direction	Total area (ha)
Redcar to Saltburn Coast LWS	Designated for vascular plants and coastal grassland, covering both the sandy foreshore and low boulder cliffs, and for its wintering bird assemblage.	NZ641228	0/NE	164.1
Wilton Woods Complex LWS	Broadleaved woodland and replanted ancient woodland.	NZ580193	0.6/S	256.3



PROJECT TITLE

DOGGER BANK TEESSIDE A & B

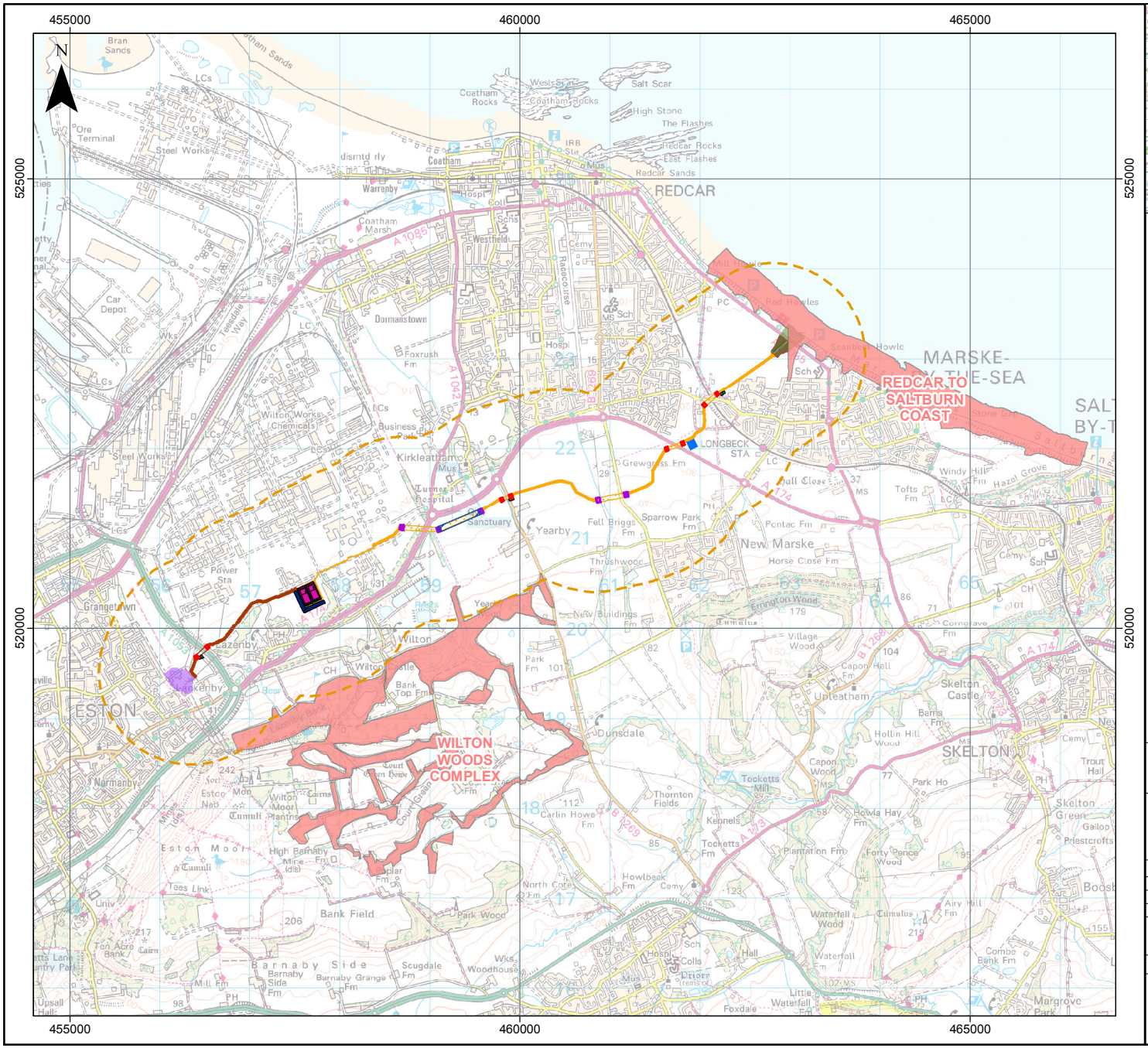
DRAWING TITLE

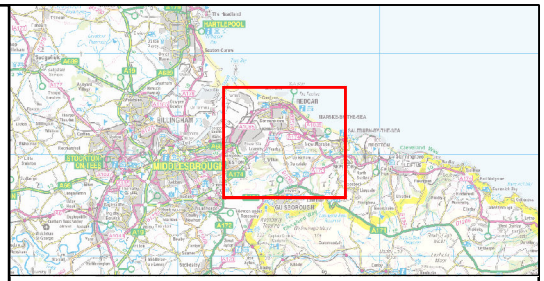
Figure 4.1: Statutory Designated Sites

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-200**

SCALE	1:100,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG





LEGEND

- Non-statutory designated sites desk study area
- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- Local Wildlife Sites (LWS)

0 2

Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.2: Non-Statutory Designated Sites

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
4	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-201**

SCALE	1:65,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

4.3 Habitats

Overview

4.3.1 The Dogger Bank Teesside A & B study area is dominated by arable habitats bordered by industrial land and residential development to the north and the North York Moors to the south. The lowland arable landscape comprises agricultural grasslands, arable fields and woodlands, with scattered villages such as Yearby and Kirkleatham and newer residential development such as New Marske.

4.3.2 The range of habitats along the cable corridor was limited with large areas of either arable fields, sheep or horse grazed semi-improved grassland or developed land. More notable habitats included the narrow strip of coastal grassland at the landfall (within the boundary of the Redcar to Saltburn Coast LWS) and areas of woodland and wetland habitats including ponds, ditches and wet/marshy grassland. Both grasslands and arable fields were divided by shallow drainage ditches and hedgerows. There are three larger water courses running south to north across the cable corridor: Kettle Beck, Mains Dike, and Roger Dike. Long Beck, a slightly smaller water course is located near the landfall and runs west to east.

4.3.3 Detailed habitat maps are provided as **Figure 4.3** to **Figure 4.9**.

Spatial statistics

4.3.4 The Extended Phase 1 Habitat Survey mapping includes 26 specific habitat types. For ease of reference and to facilitate synopsis, these 26 habitat types have been grouped where appropriate to form a refined list of ten broad habitats, as follows (the 26 specific habitat types are italicised in **Table 4.3**).

Table 4.3 Broad habitat types identified within the study area

Broad habitats	Description and specific habitats
Arable	*Arable land*: ploughed fields actively farmed for cereals, oilseed rape and root crops
Agriculturally improved grasslands	*Improved grasslands* and *amenity grasslands* - both high-input grasslands (enriched by inorganic fertilisers) of low ecological value
Semi-improved grasslands	Including *poor semi-improved* or *neutral grassland - semi-improved*. For this synopsis, these were viewed as synonymous, as they were dominated by species poor semi-improved grasslands on neutral soils
Coastal grassland	Includes *coastal grassland* habitat only
Ruderal habitats	Dominated by plants colonising disturbed ground, including *ruderal/disturbed*, *tall herb and fen – tall ruderal and manure piles*
Woodland and scrub	All types of wooded (i.e. tree/shrub dominated) habitat, including: *broadleaved woodland semi-natural*; *broadleaved woodland plantation*; *mixed woodland plantation*; and *scrub*
Hedgerow	All semi-natural *hedgerows*
Wetland vegetation	*Marshy grassland* and *marginal vegetation* associated with ponds, including: marsh/marshy grassland and marginal vegetation
Open water	Including *running water* and *standing water – eutrophic*

Broad habitats	Description and specific habitats
Developed land	Including *bare-ground*, *bare-ground/hardstanding*, *hardstanding*, *railway*, *buildings*, *allotment*, *ornamental planting* and *private/residential* (including some private gardens but not all)

4.3.5 **Table 4.4** provides a detailed breakdown of the GIS statistics for these broad habitats, considering both the 1km wide study area and the working footprint (all temporary and permanent working areas, please see **Chapter 5 Project Description**).

Table 4.4 Habitats in the study area

Habitats	Area/length: 1km wide study area (ha)	% of study area	Area/length working width (ha)	% of working footprint
Arable	437.7	46.5	38.4	88.9
Agriculturally improved grasslands	108.7	11.5	0.9	2.1
Semi-improved grasslands	94.1	10.0	1.1	2.5
Coastal grassland	3.8	0.4	0.0	0.0
Ruderal habitats	2.0	0.2	0.0	0.1
Woodland and scrub	61.2	6.5	0.7	1.8
Wetland vegetation	0.4	0.0	0.0	0.0
Open water	4.1	0.4	0.0	0.0
Developed land	225	23.9	1.9	4.6
No access	3.6	0.4	0.0	0.0
Hedgerows*	22.3km	-	0.7km	-
Total	**940.6**	**100.0**	**43.2**	**100.0**

* Hedgerow length is given in km and is not included in the area total.

4.3.6 The spatial statistics show the 1km wide study area comprises 46.5% arable, together with 11.5% agriculturally improved grasslands and 10% semi-improved grasslands. Given that the semi-improved grasslands are species-poor in nature, the study area is dominated by arable fields and species-poor grasslands to the extent of 68.1%. The remaining 31.9% includes 23.9% developed land and 6.5% of woodland and scrub, leaving only 1.5% of the study area to be spread across the other minority habitats. It was not possible to access 0.4% of the study area; however these areas were typically located on the outer edge of the study area and are not considered to represent a constraint to this assessment.

4.3.7 When considering the working area, the spatial statistics show that the proportion of arable fields and semi-improved grassland is significantly higher (90.9%) than the wider study area (68.1%) indicating that Dogger Bank

Teesside A & B is largely situated within agricultural habitats of lower ecological value.

4.3.8 Detailed habitat survey information is provided in the Extended Phase I Habitat Survey Report (Peak Ecology 2013c). A summary is provided in the following sections.

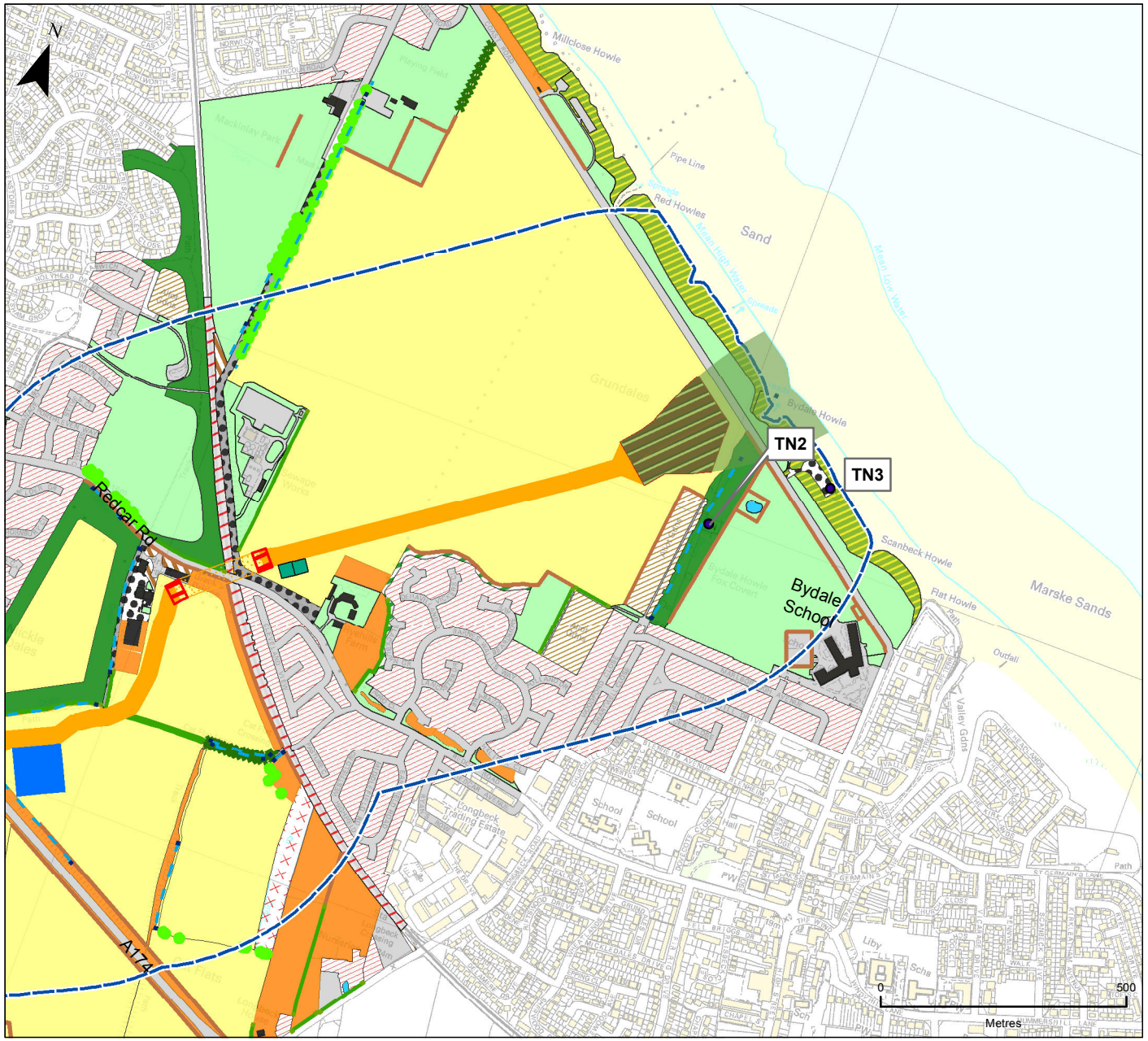
Evaluation of habitats with biodiversity value

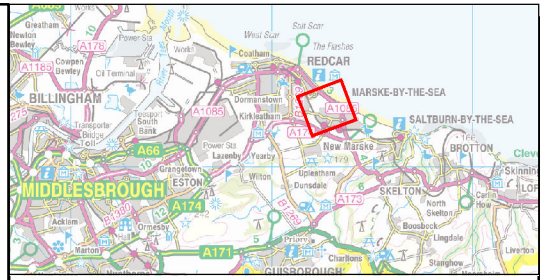
Overview

4.3.9 Each habitat feature present within the 1km wide study area was checked against the UK BAP and the Tees Valley LBAP. A summary of the habitats with biodiversity value of relevance to the study area is presented in **Table 4.5**. References are to Target Notes (TNs), i.e. points of interest noted during the habitat mapping and on **Figure 4.3** to **Figure 4.9**.

Table 4.5 Summary of habitats within the study area and their potential for BAP status

Habitats	UK BAP priority habitat	Local BAP	Applicability
Arable	Yes (Arable Field Margins)	Yes	In general the arable field margins within the survey area on site were not BAP priority habitats. Many fields had small field margins which contained no notable arable weeds and most contained common semi-improved grassland species assemblages.
Grassland	Yes (Lowland Meadow, Roadside Verges)	Yes	Most of the grassland was low quality improved and semi-improved pasture. None of these areas are considered as potential priority habitat. The most diverse of these grasslands appeared to be associated with road verges which were still poor quality and species-poor.
Maritime cliffs and slopes	Yes	Yes	The small cliffs at the landfall are subject to continual erosion, un-vegetated and are not considered to be priority habitat under the BAP.
Broadleaved woodland	Yes (Semi-natural broadleaved lowland woodland)	Yes	Ancient woodland indicators were present in some woodlands (TN 1 & TN 2). Much of the broadleaved woodlands were plantation shelterbelts or recent plantations which are not classed as priority habitat.
Mature trees	No (only considered in wood pasture and parkland priority habitat)	No	There were mature trees along the corridor, although none were found within a wood pasture or parkland habitat.
Gardens and allotments	No	Yes	There are a number of allotment gardens throughout the study area. It is unlikely that these areas are to be impacted, as they are located within the outer edges of the study area.
Ponds	Yes	Yes	It is possible that at least some ponds on site would be considered priority habitat, although none were found to contain great crested newts, which is often a material consideration. None will be directly impacted on by the scheme.
Hedgerows	Yes	Yes	Most hedgerows, regardless of quality, fall under the priority habitat type.





LEGEND

- Onshore cable route - 500m buffer
- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B intermediate construction compound (784m²)
- Water
- Hedgerow
- Fence
- Scrub
- Tree

Miscellaneous

- Arable
- Allotment
- Amenity grassland
- Bare ground/hard standing
- Bare ground
- Building
- Hardstanding
- Railway
- Awaiting classification; No access
- Private/residential

Swamp & Open Water

- Standing water - eutrophic

Tall Herb & Fen

- Tall herb and fen - tall ruderal; Scattered tall ruderal; Ruderal/disturbed

Grassland Marsh

- Neutral grassland - semi-improved
- Coastal grassland

Woodland & Scrub

- Broadleaved woodland- semi-natural; Broadleaved woodland- semi-natural
- Broadleaved woodland - plantation
- TN Target Note

Data Source:
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PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.3: Extended Phase 1 Habitat Survey - Section 1

VER	DATE	REMARKS	Drawn	Checked
2	29/08/2013	Draft	SW	SDS
3	17/09/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER:

F-ONL-MA-202

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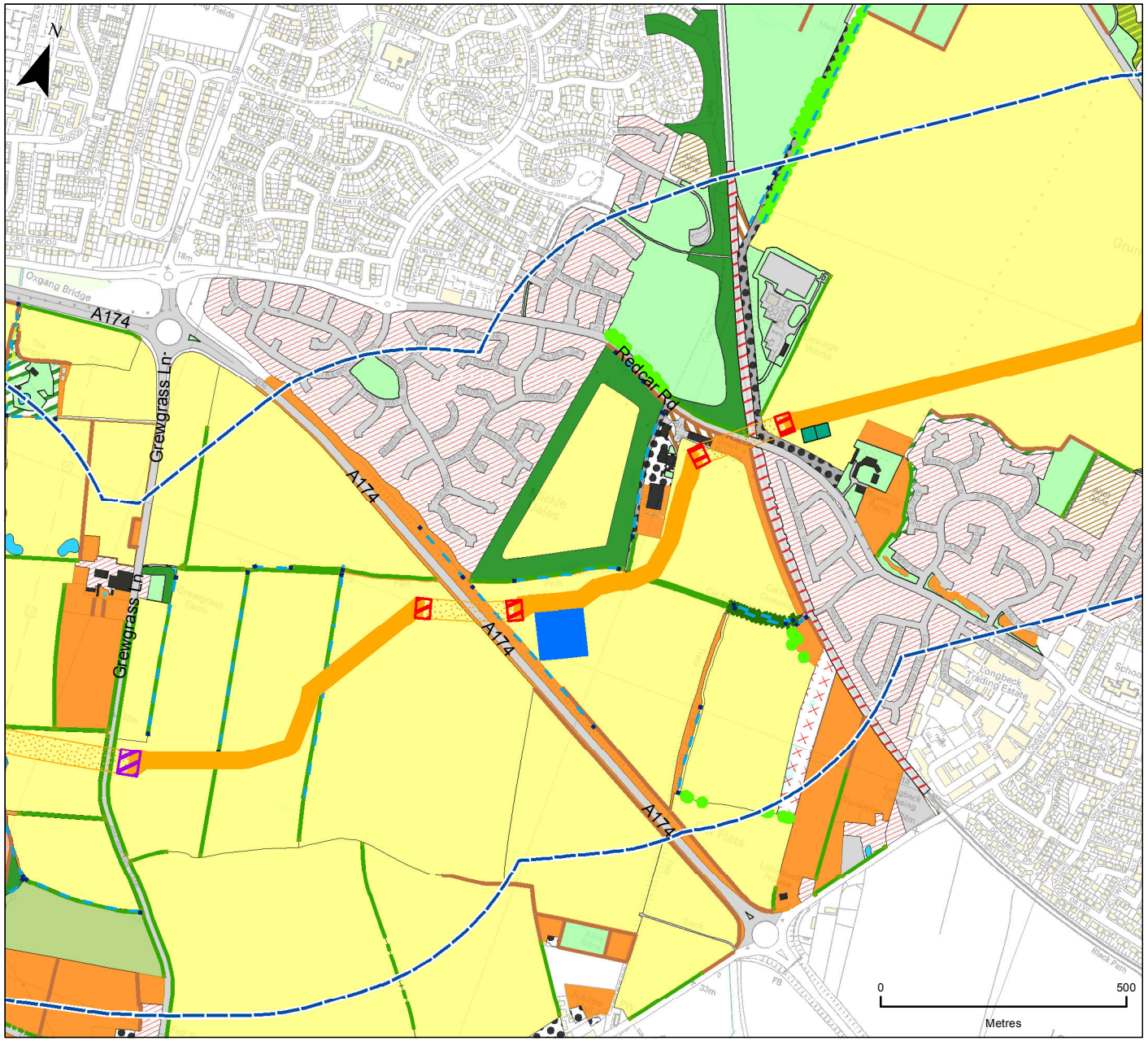

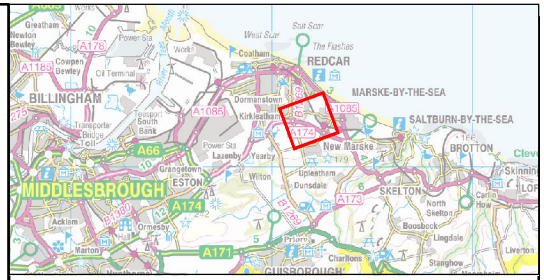

LEGEND

- Onshore cable route - 500m buffer
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Water
- Hedgerow
- Fence
- Scrub
- Tree

Miscellaneous

- Arable
- Amenity grassland
- Bare ground/hard standing
- Bare ground
- Building
- Hardstanding
- Railway
- Awaiting classification; No access
- Private/residential

Tall Herb & Fen

- Tall herb and fen - tall ruderal; Scattered tall ruderal; Ruderal/disturbed

Grassland Marsh

- Neutral grassland - semi-improved

Woodland & Scrub

- Broadleaved woodland- semi-natural; Broadleaved woodland- semi-natural
- Broadleaved woodland - plantation
- Scrub

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.4: Extended Phase 1 Habitat Survey - Section 2

VER	DATE	REMARKS	Drawn	Checked
2	29/08/2013	Draft	SW	SDS
3	17/09/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER:

F-ONL-MA-203

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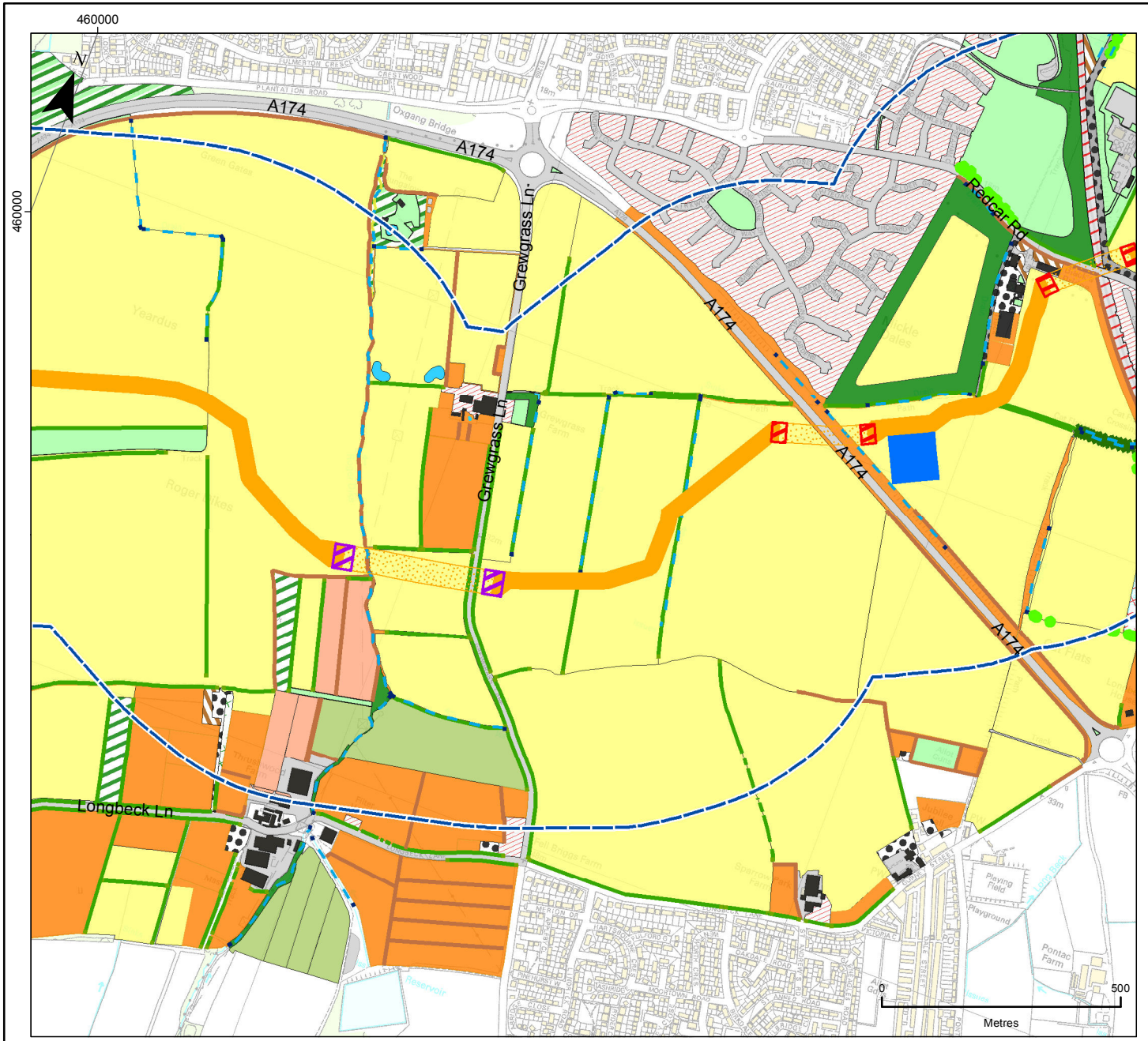

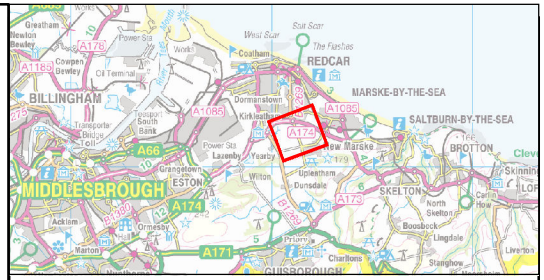

LEGEND

- Onshore cable route - 500m buffer
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B cable route primary construction compound (10,000m²)
- Water
- Hedgerow
- Fence

Miscellaneous

- Arable
- Amenity grassland
- Bare ground/hard standing
- Bare ground
- Building
- Hardstanding
- Private/residential

Swamp & Open Water

- Standing water - eutrophic

Grassland Marsh

- Grassland - poor semi-improved
- Neutral grassland - semi-improved
- Improved grassland

Woodland & Scrub

- Broadleaved woodland- semi-natural; Broadleaved woodland- semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - plantation

Data Source:
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PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.5: Extended Phase 1 Habitat Survey - Section 3

VER	DATE	REMARKS	Drawn	Checked
2	29/08/2013	Draft	SW	SDS
3	17/09/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER:

F-ONL-MA-204

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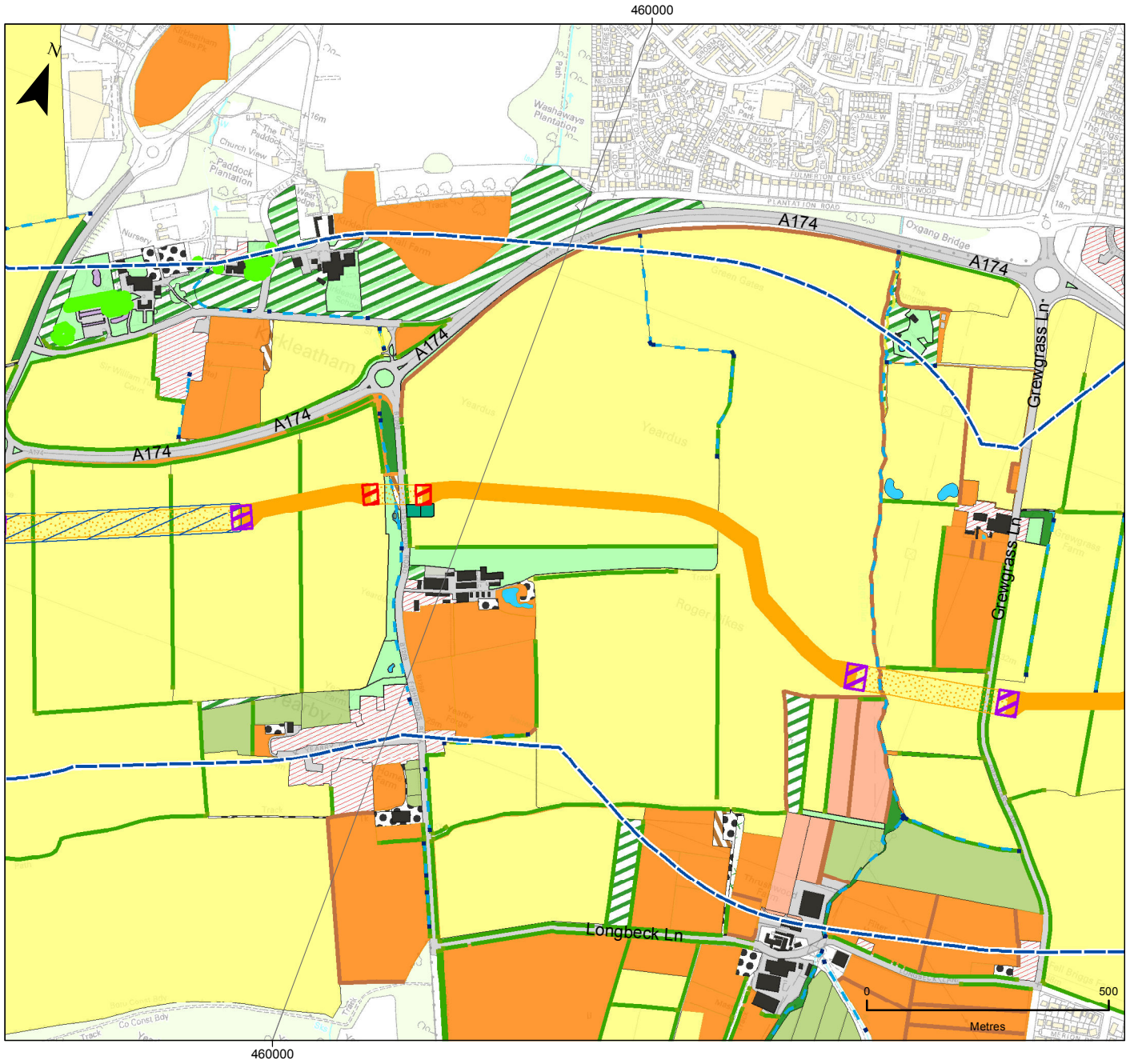
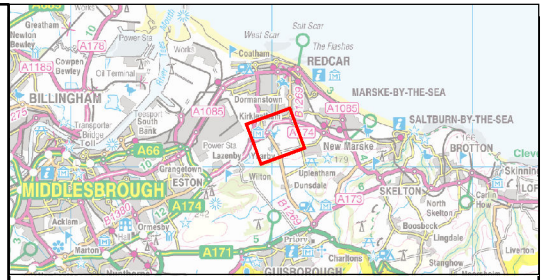
FOREWIND





LEGEND

- Onshore cable route - 500m buffer
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B intermediate construction compound (784m²)
- Water
- Hedgerow
- Fence

Miscellaneous

- Arable
- Amenity grassland
- Bare ground
- Building
- Hardstanding
- Private/residential

Swamp & Open Water

- Standing water - eutrophic
- Running water

Tall Herb & Fen

- Tall herb and fen - tall ruderal; Scattered tall ruderal; Ruderal/disturbed

Grassland Marsh

- Grassland - poor semi-improved
- Neutral grassland - semi-improved
- Improved grassland

Woodland & Scrub

- Broadleaved woodland- semi-natural; Broadleaved woodland- semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - plantation

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.6: Extended Phase 1 Habitat Survey - Section 4

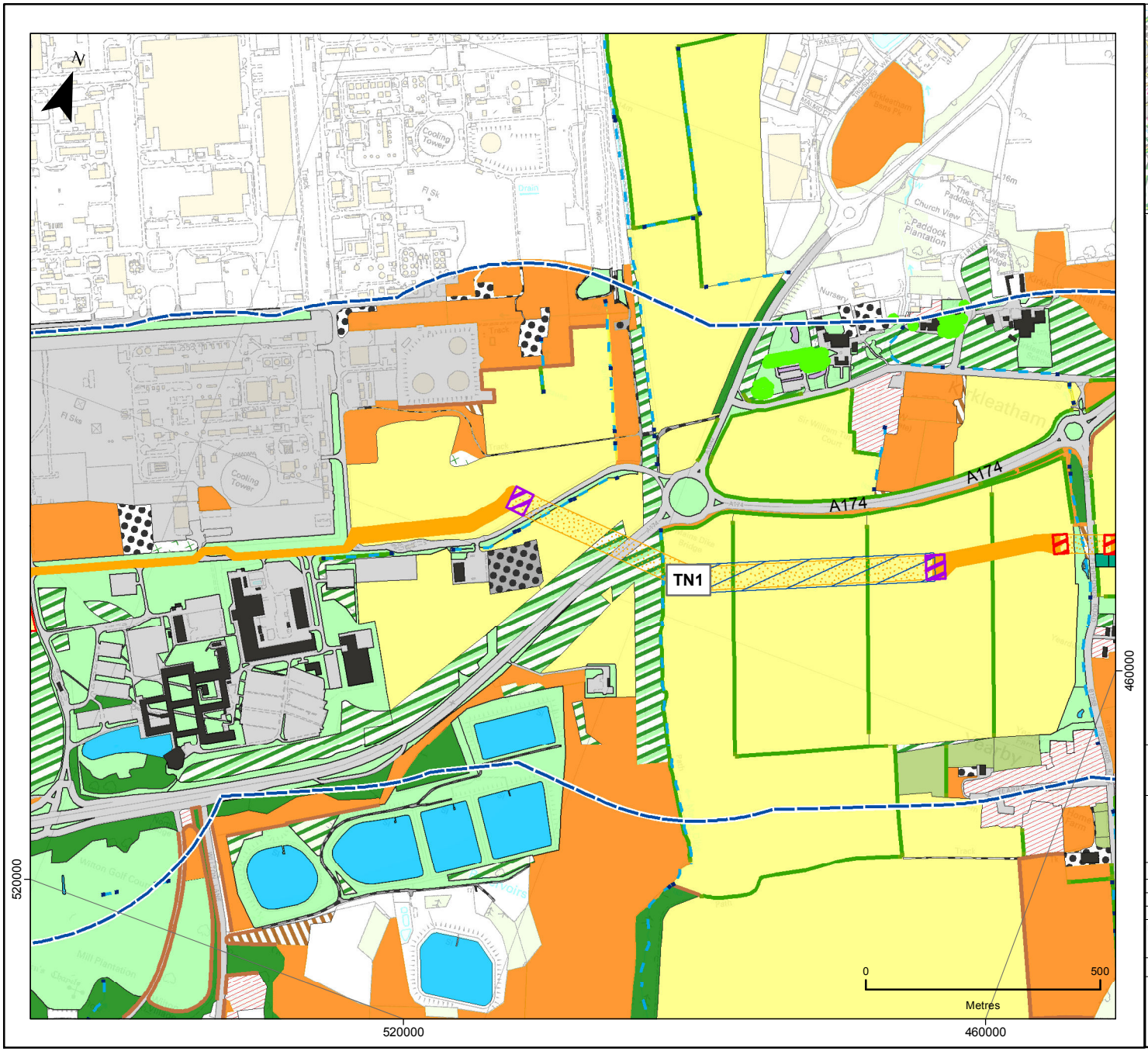
VER	DATE	REMARKS	Drawn	Checked
2	29/08/2013	Draft	SW	SDS
3	17/09/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

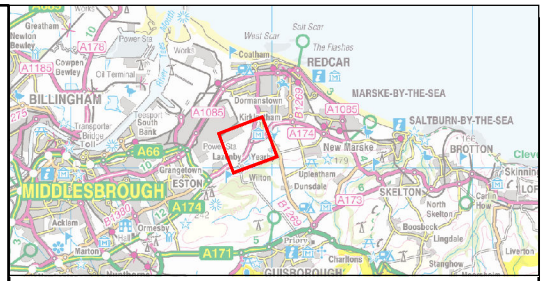
DRAWING NUMBER:

F-ONL-MA-205

SCALE	1:12,500	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND





LEGEND

- Onshore cable route - 500m buffer
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- HDD or open trench to be confirmed
- Water
- Hedgerow
- Fence
- Tree

Miscellaneous

- Ornamental planting
- Arable
- Amenity grassland
- Bare ground/hard standing
- Bare ground
- Building
- Hardstanding
- Private/residential

Swamp & Open Water

- Standing water - eutrophic
- Running water

Tall Herb & Fen

- Tall herb and fen - tall ruderal; Scattered tall ruderal; Ruderal/disturbed

Grassland Marsh

- Neutral grassland - semi-improved
- Improved grassland

Woodland & Scrub

- Broadleaved woodland- semi-natural; Broadleaved woodland- semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Scrub
- TN Target Note

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.7: Extended Phase 1 Habitat Survey - Section 5

VER	DATE	REMARKS	Drawn	Checked
2	29/08/2013	Draft	SW	SDS
3	17/09/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER:

F-ONL-MA-206

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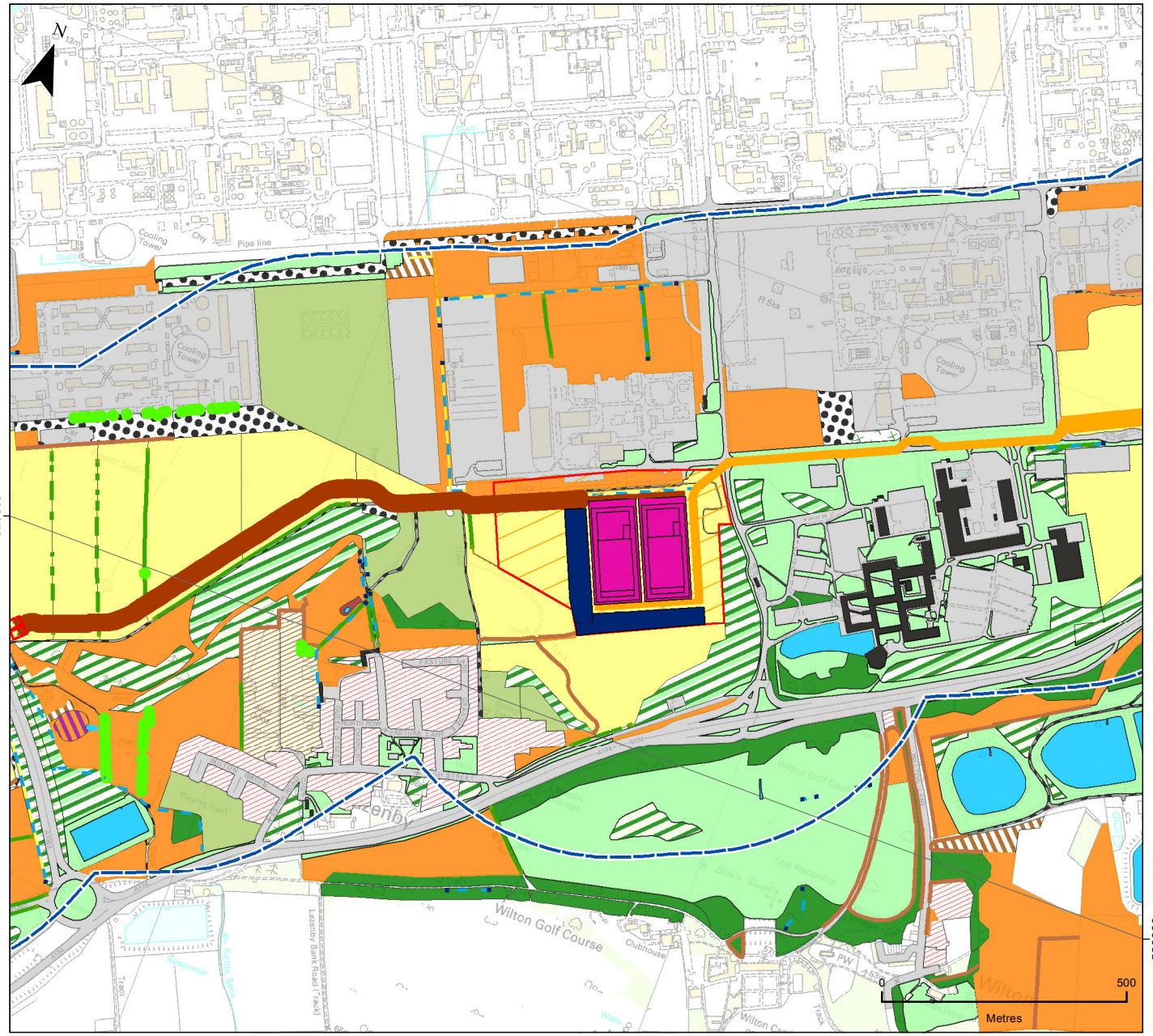
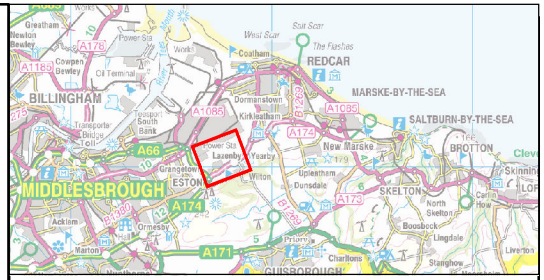
FOREWIND





LEGEND

- Onshore cable route - 500m buffer
- Teesside A&B HVDC, Open trench
- Teesside A&B HVAC, Open trench
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Converter site
- Water
- Hedgerow
- Fence
- Tree

Miscellaneous

- Arable
- Allotment
- Amenity grassland
- Manure pile
- Bare ground/hard standing
- Bare ground
- Building
- Hardstanding
- Private/residential

Swamp & Open Water

- Standing water - eutrophic
- Running water

Tall Herb & Fen

- Tall herb and fen - tall ruderal; Scattered tall ruderal; Ruderal/disturbed
- Marginal vegetation

Grassland Marsh

- Neutral grassland - semi-improved
- Improved grassland

Woodland & Scrub

- Broadleaved woodland- semi-natural; Broadleaved woodland- semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Scrub

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.8: Extended Phase 1 Habitat Survey - Section 6

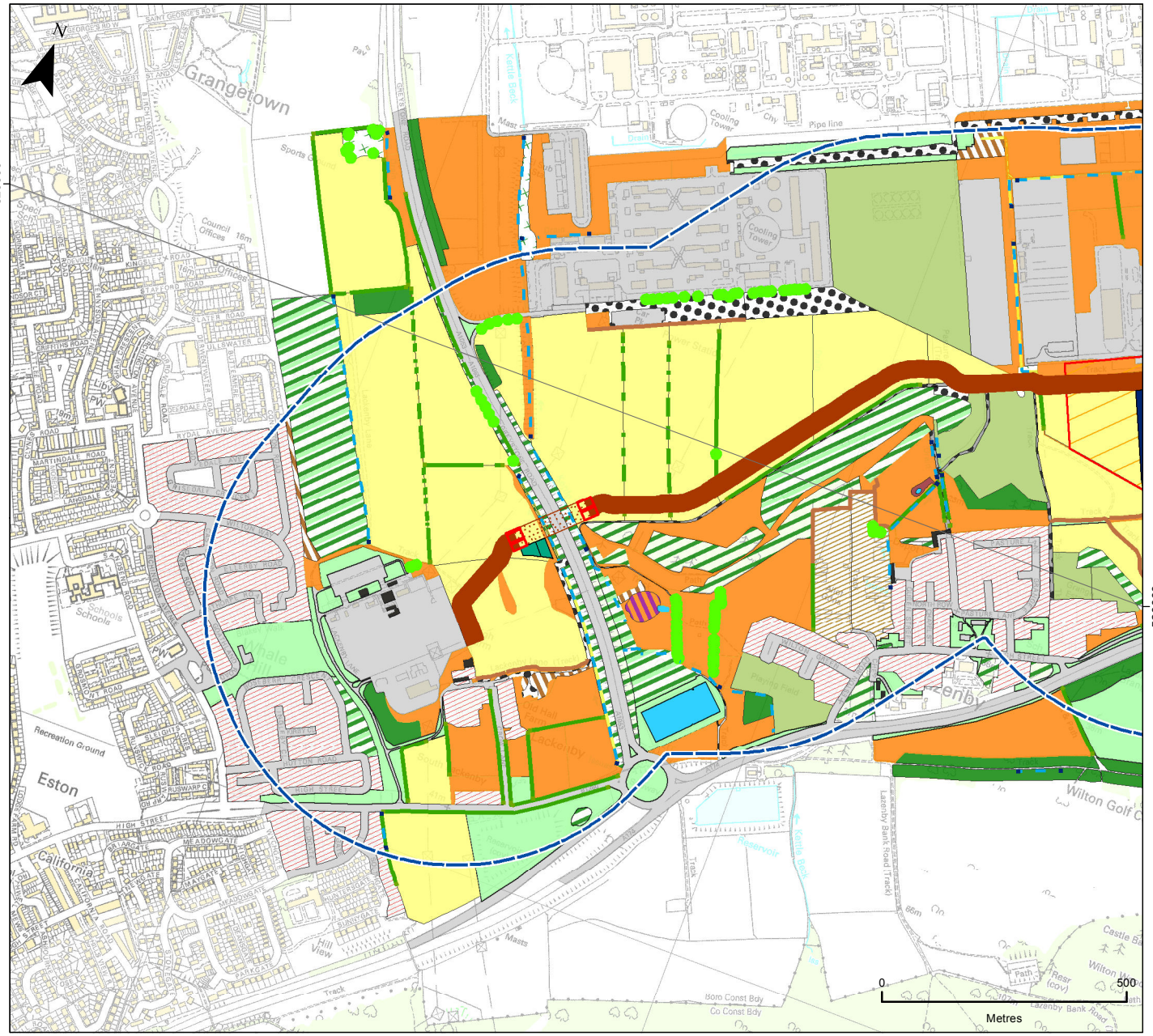
VER	DATE	REMARKS	Drawn	Checked
2	29/08/2013	Draft	SW	SDS
3	17/09/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

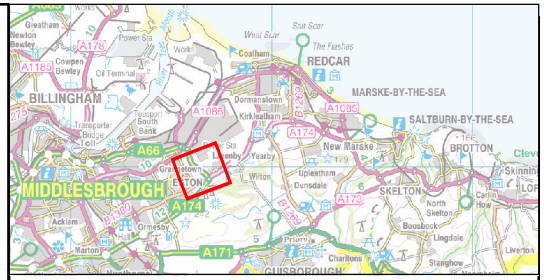
DRAWING NUMBER:

F-ONL-MA-207

SCALE	1:12,500	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND





LEGEND

- Onshore cable route - 500m buffer
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B intermediate construction compound (784m²)
- Water
- Hedgerow
- Fence
- Tree

Miscellaneous

- Arable
- Allotment
- Amenity grassland
- Bare ground/hard standing
- Bare ground
- Building
- Hardstanding
- Private/residential

Swamp & Open Water

- Standing water - eutrophic
- Running water

Tall Herb & Fen

- Tall herb and fen - tall ruderal; Scattered tall ruderal; Ruderal/disturbed
- Marginal vegetation

Grassland Marsh

- Neutral grassland - semi-improved
- Marsh/marshy grassland
- Improved grassland

Woodland & Scrub

- Broadleaved woodland- semi-natural; Broadleaved woodland- semi-natural
- Broadleaved woodland - plantation
- Mixed woodland - plantation

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.9: Extended Phase 1 Habitat Survey - Section 7

VER	DATE	REMARKS	Drawn	Checked
2	29/08/2013	Draft	SW	SDS
3	17/09/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER:

F-ONL-MA-208

SCALE	1:12,500	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

4.3.10 The following paragraphs provide some expansion on those habitats present which appear to represent BAP quality habitats. As in **Table 4.5**, the headings used are taken from the UK BAP priority listings. Where a habitat type is known exclusively or particularly from a designated site, it is considered under the site in question.

Broadleaved woodland

4.3.11 There were several pockets of woodland along the cable corridor; however most were either too small or not of sufficiently high quality to fall under the UK BAP or LBAP Priority Habitat designation. One area of woodland (see TN 1; **Figure 4.7**) may well qualify as LBAP priority habitat due to the presence of a diversity of broadleaved species (mature trees: ash *Fraxinus excelsior*, oak *Quercus spp.*), and a ground flora with ancient woodland indicators (dog's mercury *Mercurialis perenne*, ramsons *Allium ursinum* and bluebells *Hyacinthoides non-scripta*).

Coastal grassland

4.3.12 The coastal grassland was a narrow strip confined to the cliff tops and dune area (see TN 3; **Figure 4.3**). Some areas of the grassland appeared tussocky and species poor in nature. Whilst these areas of grassland supported flora different to that found in the nearby amenity, agriculturally improved or species poor semi-improved grassland, they were small and unlikely to qualify as Priority Habitat in BAP terms. They do however fall within the boundary of the Redcar to Saltburn Coast LWS.

Hedgerow

4.3.13 All hedgerows (of at least 20m length) consisting predominantly (i.e. 80% or more cover) of at least one woody UK native species are covered by the 'Hedgerow' BAP Priority Habitat. Therefore, the majority of the hedgerows within the study area would be considered Priority Habitat, as the hedgerows were recorded as being species poor and dominated by hawthorn *Crataegus monogyna*.

Identification of Valued Ecological Resources (Habitats)

4.3.14 A summary has been provided of the main habitat types found within the study area. **Table 4.6** assigns a 'value' to each habitat type to inform the selection of habitat types considered to be VER.

Table 4.6 Identification of Valued Ecological Habitat Resources

Receptor	Key features	Geographical scale of importance	Rationale
Coastal grassland contained within the Redcar to Saltburn Coast LWS	Designated for its Coastal Grassland Habitat and Vascular Plants	County	LWS are non-statutory sites, often known as County Wildlife sites and as such are of County value. This site is small and not in a particularly favourable condition.
Hedgerows	Typically species-poor	County	The hedgerows are predominantly species poor and none qualify as

Receptor	Key features	Geographical scale of importance	Rationale
			'Important' under the Hedgerow Regulations. They are however an integral part of the agricultural landscape and help to provide connectivity between semi-natural habitat features and habitat resources for bats and farmland birds.
Woodland and scrub	Includes all woodland and scrub habitat types, which combined comprise 6.5% of the study area.	Local	There are a number of woodland habitats listed as Priority Habitats under the UKBAP and LBAP Broad Habitat Broadleaved, Mixed and Yew Woodland. Much of the woodland in the study area is planted and not of high ecological value but the plantations do supplement the hedgerow network.
Arable	Large arable fields divided by field drains and/or hedgerows represent the dominant habitat type (46.5% of cable corridor).	Local	Arable Field Margins are a UKBAP Priority Habitat however higher quality margins are not common within the study area. There is an Arable Field Margin Habitat Action Plan (HAP) cited in the Tees Valley LBAP. The farmland landscape of which arable fields are the major component supports a valuable farmland bird fauna.
Agriculturally improved grasslands	Agriculturally improved grassland is the second most frequent natural habitat type (11.5 %).	Local	The agriculturally improved grassland within the study area is of low ecological value. They play a supporting role in terms of supporting declining farmland birds, particularly species such as lapwing *Vanellus vanellus*.
Semi-improved grassland	Semi-improved grasslands account for 10%.	Local	Neutral grassland – Lowland Meadows is a UK BAP Priority Habitat, but the areas within the study area are all species poor and not considered priority habitat.
Ruderal habitats	Accounts for 0.2%.	Local	Ubiquitous habitat type with only common species recorded.
Wetland vegetation	Accounts for 0.1%.	Local	Limited in extent and not a valued habitat within the study area.
Open water	Open water includes ditches, ponds and streams and accounts for 0.4%.	Local	Limited in extent and not a valued habitat within the study area.
Developed land	Areas of hard standing, buildings and bare ground (23.9 %).	Local	Includes some residential gardens but is dominated by industrial areas with little value to wildlife.

4.3.15 The final scope of VER (habitats) includes:

- Coastal grassland within the Redcar to Cleveland LWS (which will be assessed under designated sites); and
- Hedgerows.

4.4 Species of principal importance - bats

Overview

4.4.1 As part of the desk study, existing records of bats and bat roosts within a 5km study area were obtained. Habitats considered suitable for roosting, foraging or commuting bats, and with the potential to be affected by the proposed development, were identified using online aerial photography, as part of the Extended Phase 1 Habitat Survey and via records data. The records data included existing records of bats and bat roosts within a 5km study area. Since suitable habitats were identified, bat activity surveys were undertaken.

4.4.2 A total of three transects were undertaken to cover the study area: Transect 1- Landfall to Grewgrass Farm; Transect 2 – Yearby and Transect 3 Wilton Complex (**Figure 4.10** to **Figure 4.13**). The transect surveys followed the standard survey methodology (Hundt 2012). Dusk activity surveys were undertaken in July 2012 and September 2012 and two further survey visits, undertaken at dusk and dawn within the same 24 hour period, were implemented in May/June 2013.

4.4.3 All survey data and findings are detailed in the Bat Technical Report (Peak Ecology 2013b) and summarised in the following sections.

Existing records

4.4.4 The Environmental Records and Information Centre (ERIC) and the Durham and North Yorkshire Bat Groups were contacted for records of bats or bat roosts within the 5km study area. They provided a single record of known bat roosts in the study area (see TN 1; **Figure 4.12**). The record is of a soprano pipistrelle *Pipistrellus pygmaeus* roost, approximately 75m from the cable route and located between Kirkleatham village and the A174. This record was supplied to within a 1km Ordnance Survey grid square and is likely to have been recorded in a building within Kirkleatham village, i.e. at an even greater distance from the cable route.

Summary of field surveys – Extended Phase 1 Survey

4.4.5 As part of the Extended Phase 1 Habitat Survey, habitats were assessed for their value to support roosting bats, based on criteria detailed within the 'Bat Surveys Good Practice Guidelines' (Hundt 2012). This assessment was based on the occurrence of habitat features within the landscape and the likelihood of bats being present within potential roost sites.

4.4.6 Trees on site were inspected from ground level for cavities, cracks, fissures, deadwood, woodpecker holes and dense coverings of ivy that could provide suitable roost sites for bats. No evidence of roosting bats was observed during any of the site visits. The cable route has been sited to avoid all impacts on mature trees and therefore surveys/mitigation for roosting bats was not required.

4.4.7 Hedgerows, ditches, linear features such as tree lines as well as woodland and ponds were present within the study area. These features are considered to present very good potential as commuting routes and opportunities for foraging

for bats. As a result, bat activity transects were undertaken, the overview of which is provided below.

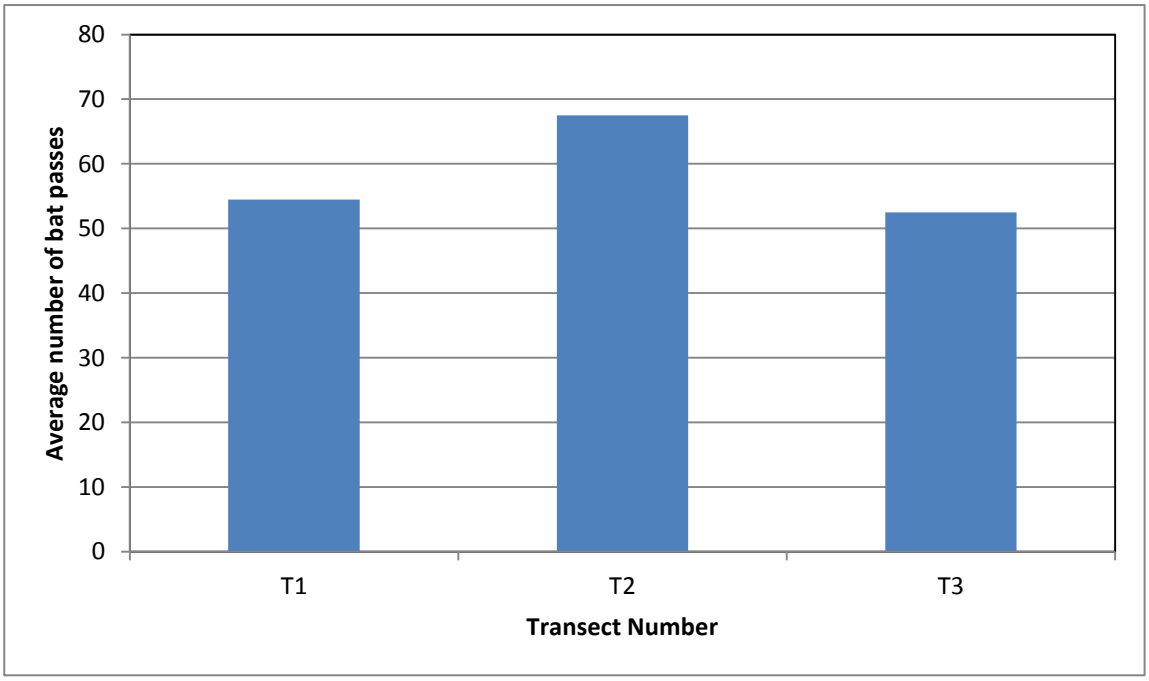
Summary of field surveys - bat activity transects

4.4.8 Bat activity was recorded during all three transects, although there was considerable variation between transects, as well as between each transect survey visit. This is likely to be representative of bat activity along the cable corridor, landfall and converter stations site, as bat activity varies with a number of factors such as the time of year, the weather conditions, random disturbance events and changes to roosting conditions.

4.4.9 Species recorded during the surveys were common and widespread including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle, Natterer's *Myotis nattereri,* Daubenton's *Myotis daubentonii* and Noctule *Nyctalus noctula*.

4.4.10 A summary of the average number of bat passes recorded during the three separate transects is displayed in **Graph 4.1**. The highest average number of bats recorded was during Transect 2 - Yearby. The habitat in this area comprises of areas of mature woodland and small water courses (Roger Dike and Main Dike and a number of ponds), connected by hedgerows and is considered good for foraging bats.

4.4.11 Transect 3 (Wilton Complex) had the lowest average levels of bat activity despite the numerous patches of woodland and stretches of open woodland around Wilton and Lazenby villages that would appear to provide good potential for foraging bats. The low average activity recorded during the transect is likely to be related to limited roosting opportunities in the area, as the availability and use of suitable summer roosting sites is likely to be directly related to the levels of foraging and commuting activity.



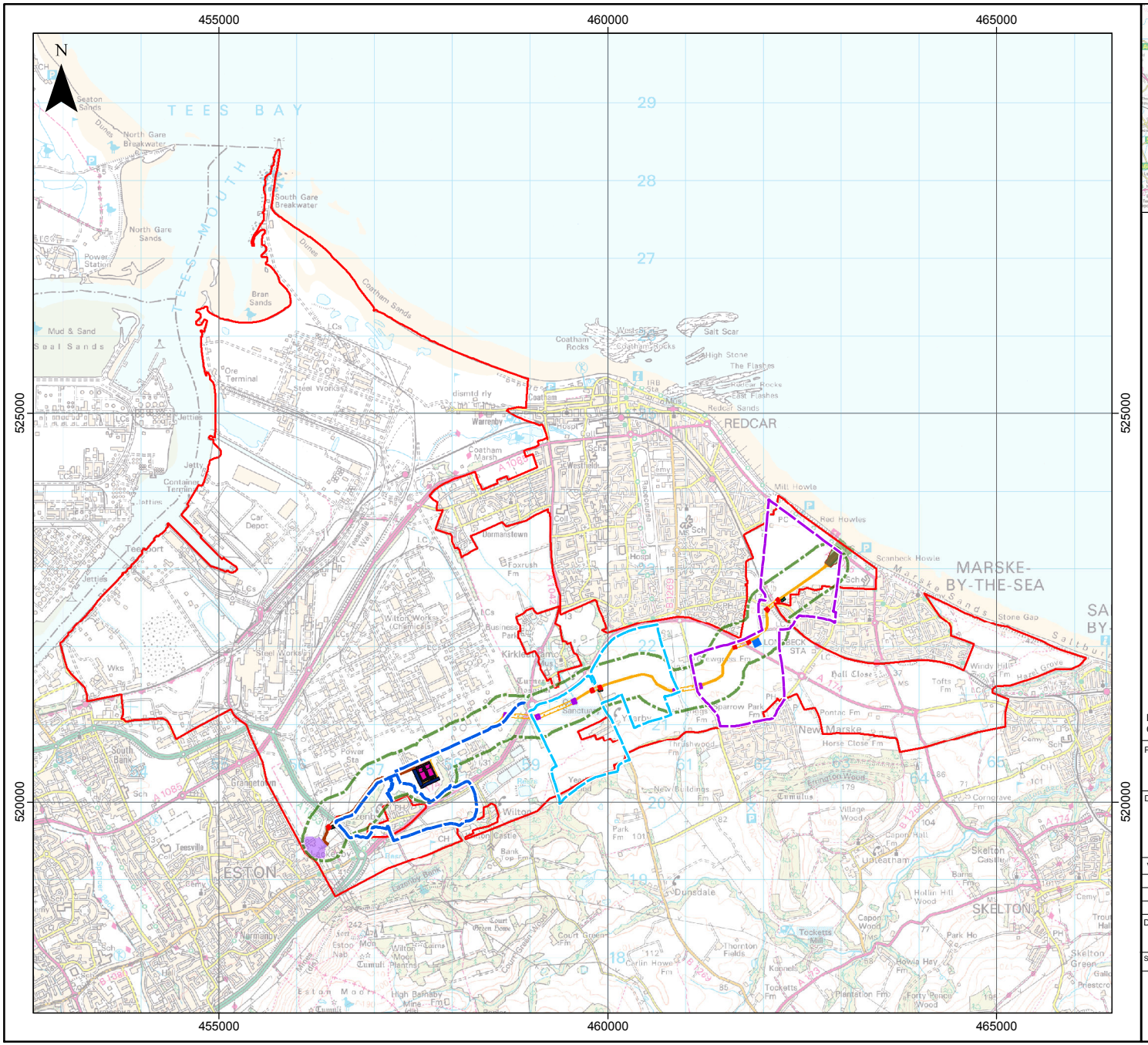
Graph 4.1 Average numbers of bat passes for each transect

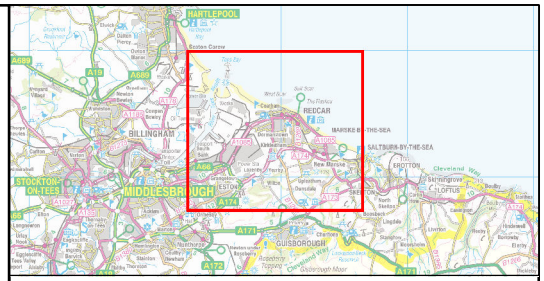
4.4.12 In general, the landscape in the survey areas provided numerous opportunities for foraging and commuting bats, as seen in the results of the transect surveys. The most important habitat features for bat movement through the landscape have been identified (based on the high level of bat activity recorded during surveys), as detailed in **Table 4.7** and identified on **Figure 4.10** to **Figure 4.13**.

Table 4.7 Locations of important foraging/commuting routes along each transect

Transect number	Sections of hedgerow/woodland considered important for bats	Sections of watercourse considered important for bats
1 – Landfall to Grewgrass Farm	Woodland adjacent to railway along Green Lane	None identified
2 – Yearby	Hedgerows immediately south of Turners Arms Farm	Roger Dike, Mains Dike
3 – Wilton Works	Northern edge woodland strip to north west of Lazenby village	None identified

4.4.13 Overall, the bat species recorded within the study area are common and widespread and therefore the assemblage is considered to be of County value.





LEGEND

- Onshore scoping study area
- Cable route 250m buffer
- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation

Bat Survey

- Transect 1
- Transect 2
- Transect 3

0 2
Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

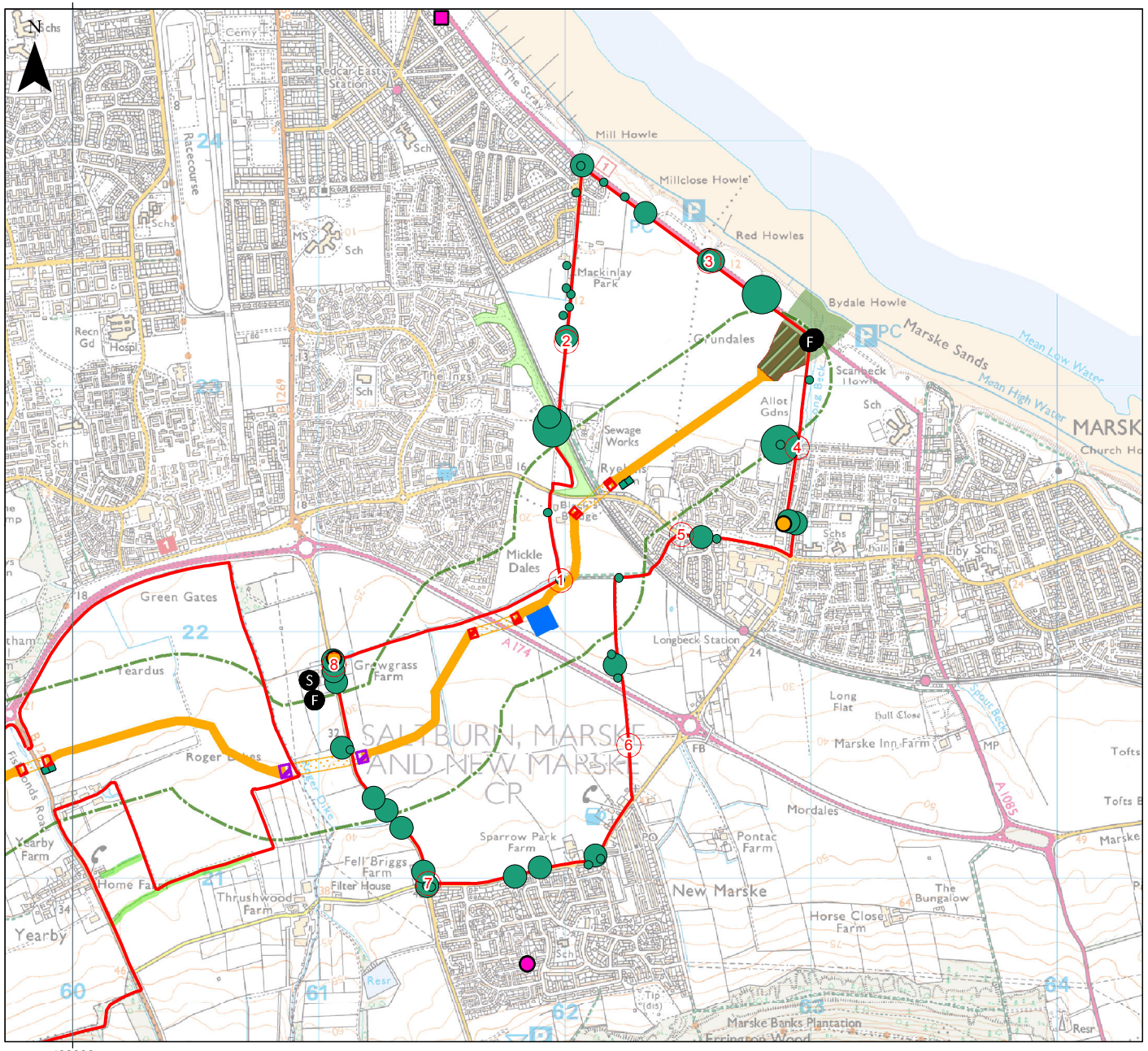
Figure 4.10: Bat Survey Overview

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
5	22/01/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-211**

SCALE	1:75,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND



LEGEND

- Cable route 250m buffer
- Teesside A&B cable landfall envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B landfall construction
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound
- Important foraging/commuting routes

Bat Transect

- Surveyed
- 1 Point Count
- F Finish
- S Start

Bat Roost Records

- Environmental Records Information Centre - North East
- Local Bat Group

Bat Observations

- Pipistrelle species
- Myotis
- Noctule
- Common Pipistrelle
- 1 bat pass
- 2 - 5 bat passes
- > 5 bat passes

0 — 1

Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

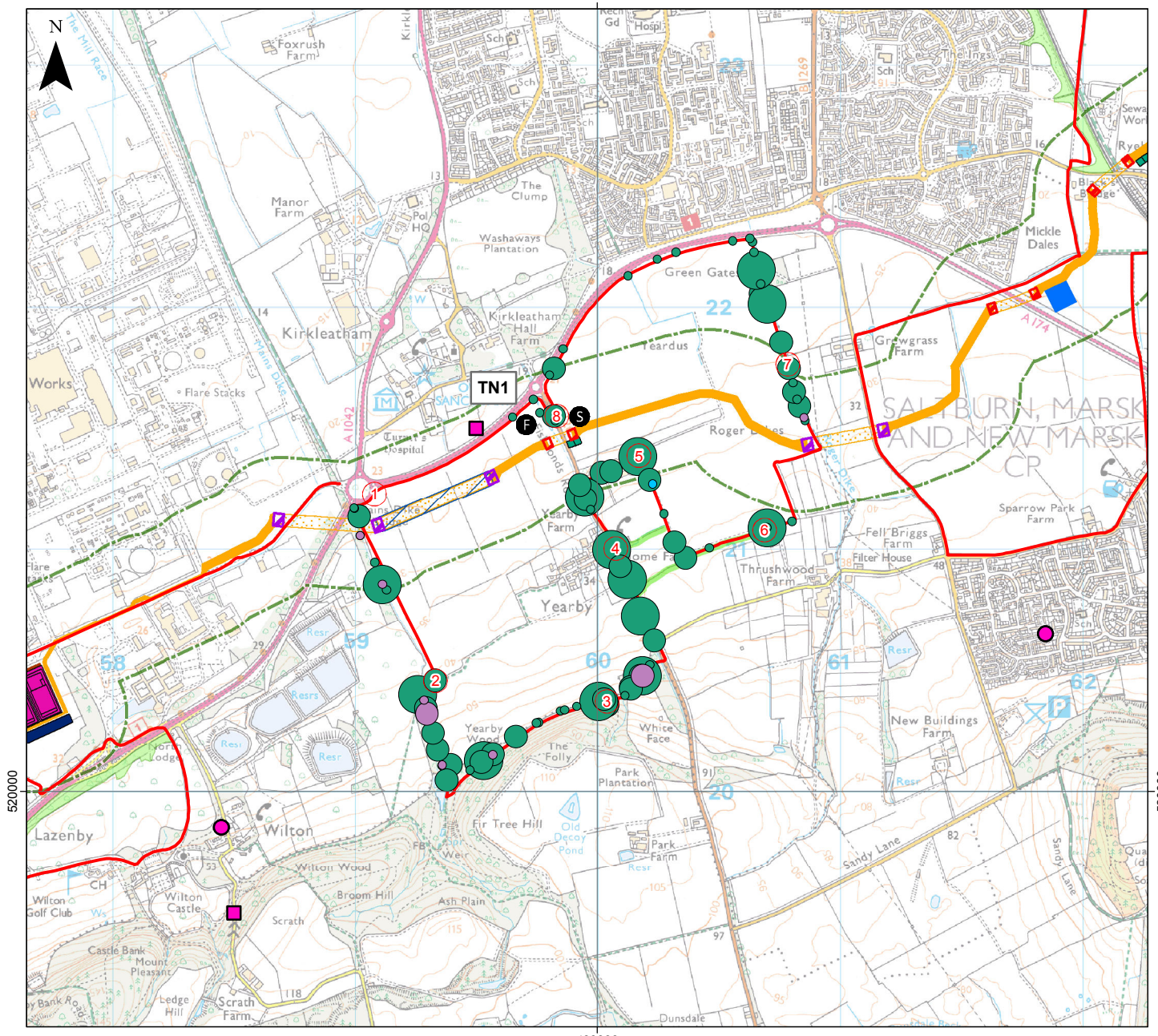
Figure 4.11: Bat Survey Transect 1

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
5	23/01/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-212**

SCALE	1:25,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND



LEGEND

- Cable route 250m buffer
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Important foraging/commuting routes

Bat Transect
- Surveyed
- 1 Point Count
- F Finish
- S Start

Bat Roost Records
- Environmental Records Information Centre - North East
- Local Bat Group

Bat Observations
- Pipistrelle species
- Myotis
- Noctule
- Common Pipistrelle
- 1 bat pass
- 2 - 5 bat passes
- > 5 bat passes

0 — 1 Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

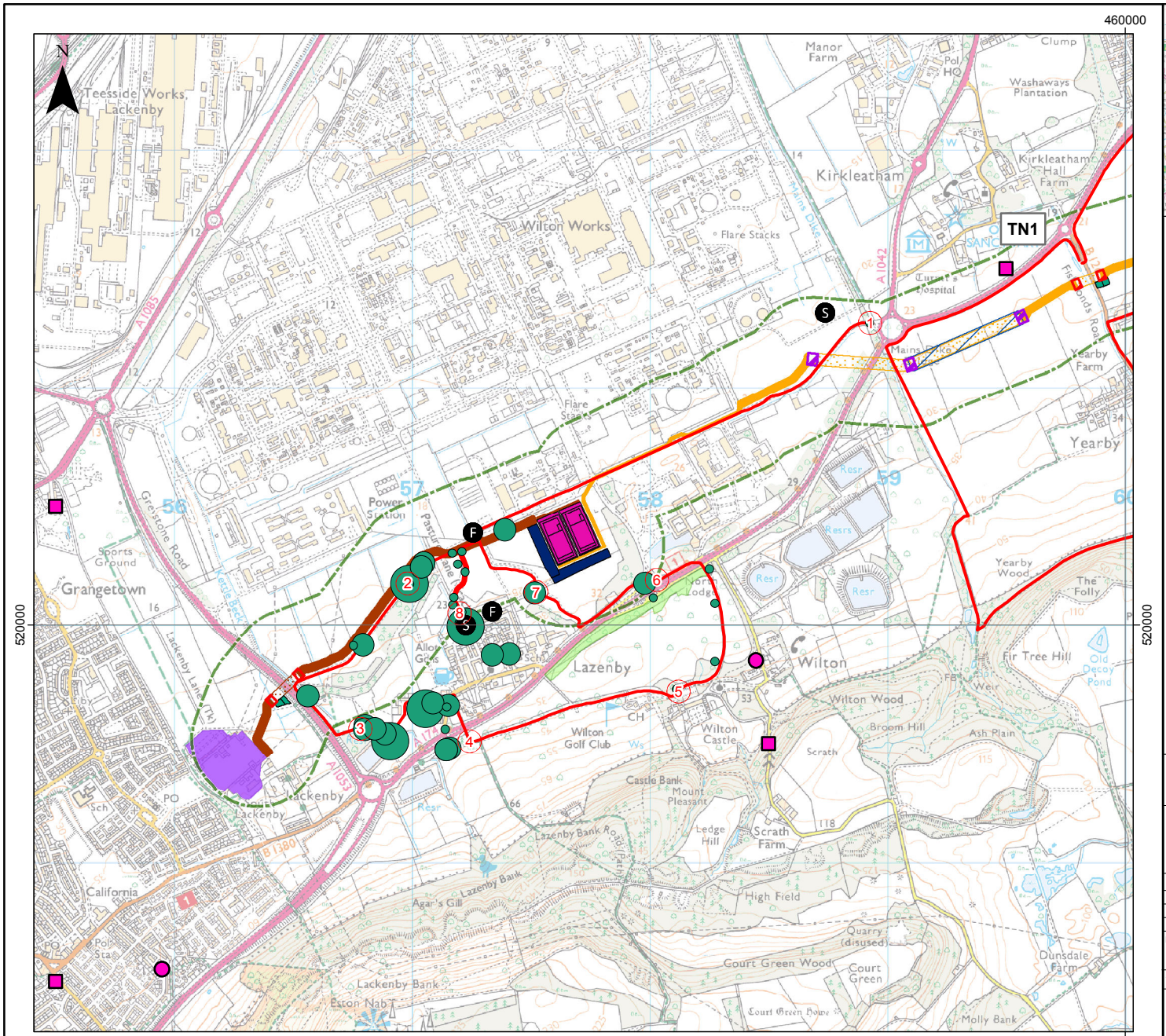
Figure 4.12: Bat Survey Transect 2

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
5	23/01/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-213**

SCALE	1:25,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND



LEGEND

- Cable route 250m buffer
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B intermediate construction compound
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- Important foraging/commuting routes

Bat Transect

- Surveyed
- Point Count
- Finish
- Start

Bat Roost Records

- Environmental Records Information Centre - North East
- Local Bat Group

Bat Observations

- Pipistrelle species
- Myotis
- Noctule
- Common Pipistrelle
- 1 bat pass
- 2 - 5 bat passes
- > 5 bat passes

0 — 1 Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.13: Bat Survey Transect 3

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
5	23/01/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-214**

SCALE	1:25,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

4.5 Species of principal importance – riparian mammals

Overview

4.5.1 Desk study records of water vole *Arvicola amphibius* and otter *Lutra lutra* were obtained from ERIC and have been mapped on **Figure 4.14**. The habitat within the study area included networks of field drains and larger watercourses which were considered to offer potential to support riparian mammals. Field surveys of all potential watercourses were undertaken in 2012 and spring 2013. The full survey results can be found in the 'Riparian Mammal Technical Report' (Peak Ecology 2013e).

Existing records

4.5.2 Five records of water vole were returned by the ERIC. The closest record was from a stretch of Kettle Beck, close to Grangetown, approximately 700m to the north-west of the cable route corridor. The remaining records were located more than 1km, outside of the study area.

4.5.3 One record of otter was returned by the ERIC. The record was from 2006 and from the A1042, north of Kirkleatham, approximately 250m north of the cable route corridor. No further details were provided with the record however it is considered likely that this is a record of an otter road collision fatality.

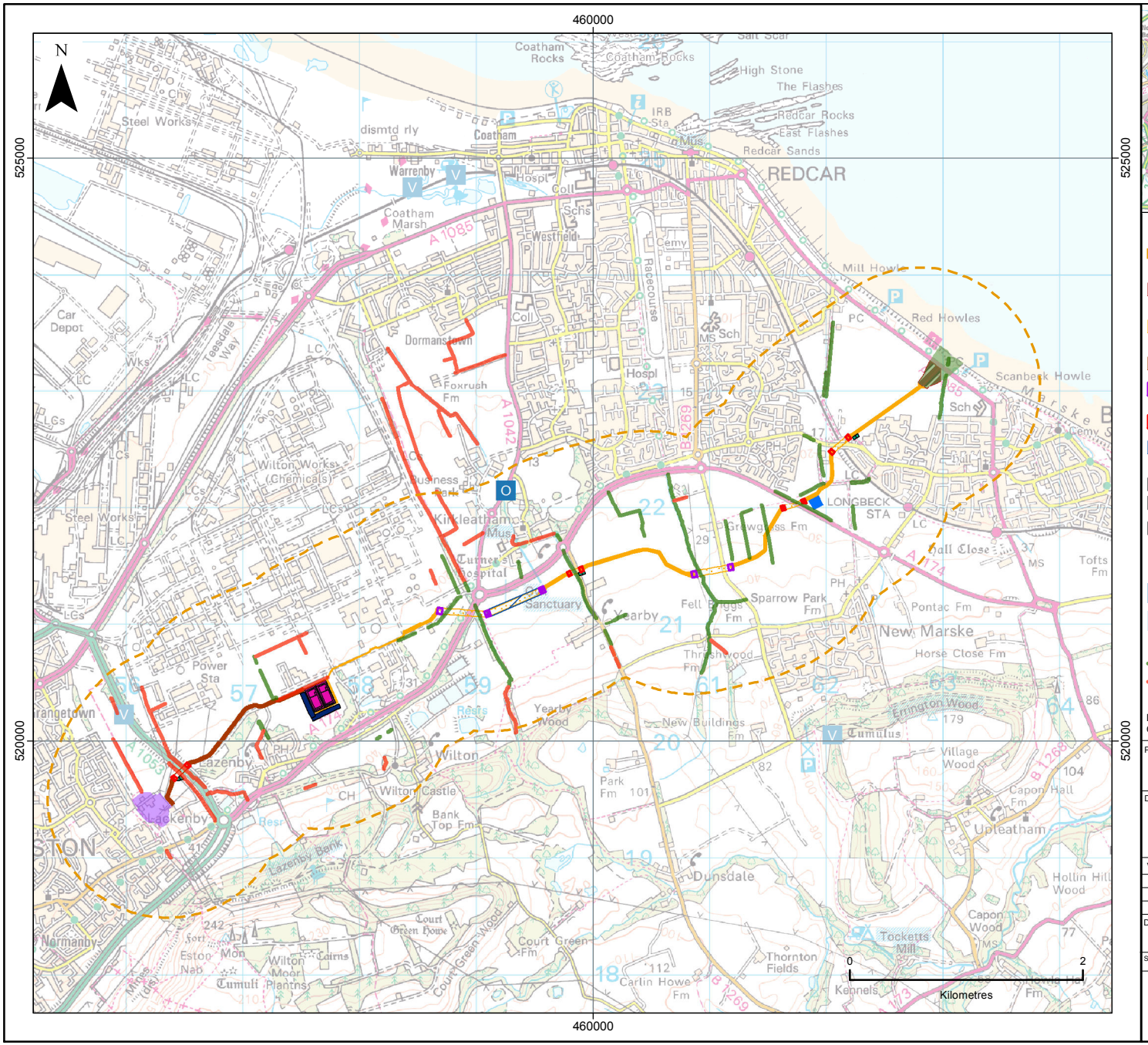
Summary of field survey

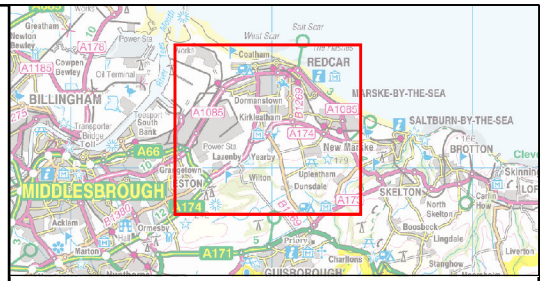
4.5.4 A total of 49 watercourses (predominantly ditches), were surveyed for riparian mammals during 2012 and 2013 (**Figure 4.14**). No signs of either water vole or otter were detected during the field surveys.

4.5.5 Of the 49 watercourses surveyed, 16 were considered unsuitable and 33 were recorded as having low potential to support water vole. Many contained minimal suitable aquatic or marginal vegetation and were located within small isolated clusters. None of the ditches were connected with Kettle Beck, where water vole had been previously recorded.

4.5.6 Overall, the majority of ditches were considered to be unsuitable for otter due to the absence of fish and other prey species.

4.5.7 Reviewing the desk study and field survey data, it is considered unlikely that riparian mammals are breeding or resident within the study area. Therefore neither species will be taken forward to the impact assessment stage. Due to the wide ranging nature of otters, it is possible that they may occasionally commute across the study area and therefore mitigation is proposed in Section 6.5 for reasons of legal compliance.





LEGEND

- Riparian mammal desk study area
- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation

Species

- O European Otter
- V European Water Vole

Otter and Water Vole Survey

- Surveyed - no otter or water vole evidence
- Not Surveyed

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.14: Riparian mammals

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
4	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER:

F-ONL-MA-210

SCALE	1:50,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

4.6 Species of principal importance – birds

Overview

4.6.1 Birds were identified as an assemblage of potential conservation interest and as such have received a relatively large amount of survey effort. This was due to the project including a coastal element (at the landfall) and the early feedback received from stakeholders (**Table 2.2**).

4.6.2 The assessment work described herein utilises the following Technical Reports:

- Breeding Birds Survey 2012 (Peak Ecology 2012);
- Wintering Birds Survey, November 2011 – March 2012 (Peak Ecology 2013a);
- Autumn Passage and Wintering Birds, September 2012 – March 2013 (Peak Ecology 2013g);
- Golden Plover and Lapwing at the Landfall – desk based assessment and additional field surveys (Peak Ecology 2014a).

Breeding birds

4.6.3 A total of three transects (Transect 1 – Landfall to Yearby; Transect 2 – Yearby to Wilton and Transect 3 – Lackenby, close to the converter stations site) were surveyed for breeding birds between April and June 2012. A summary of the results is provided below with the full results provided in Peak Ecology (2012). **Figure 4.15** to **Figure 4.18** provides a summary of the breeding bird survey data.

4.6.4 During surveys, the total number of species recorded on Transect 1 was 45; 42 on Transect 2 and 35 on Transect 3. **Table 4.8** provides a summary of the breeding bird survey data and the proportion of these that fall within different categories of conservation interest. The latter categories include being listed on Birds of Conservation Concern (BoCC) (Eaton *et al*. 2009) as Red, Amber or Green listed; inclusion as a specially protected bird on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); or listed on the UKBAP as a priority species. Some species are listed on the BoCC list and UKBAP and/or Schedule 1.

Table 4.8 Numerical summary of breeding bird survey data

Conservation status	Transect 1 Landfall to Yearby	Transect 2 Yearby to Wilton	Transect 3 Lackenby
Red listed*	10 (22%)	5 (12%)	6 (17%)
Amber listed**	12 (27%)	10 (24%)	9 (25%)
Green listed***	21 (47%)	25 (60%)	16 (45%)
Schedule 1 protected	2 (4%)	2 (5%)	4 (11%)
UK BAP species	0 (0%)	0 (0%)	0 (0%)
Feral or	12 (27%)	7 (17%)	9 (26%)

Conservation status	Transect 1 Landfall to Yearby	Transect 2 Yearby to Wilton	Transect 3 Lackenby
introduced species			
Total number of species	**45**	**42**	**35**

* Red list criteria: globally threatened, historical population decline in UK during 1800–1995, severe (at least 50%) decline in UK breeding population over last 25 years, or longer-term period (the entire period used for assessments since the first BoCC review, starting in 1969), severe (at least 50%) contraction of UK breeding range over last 25 years, or the longer-term period.

** Amber list criteria: species with unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern), historical population decline during 1800–1995, but recovering; population size has more than doubled over last 25 years, moderate (25-49%) decline in UK breeding population over last 25 years, or the longer-term period, moderate (25-49%) contraction of UK breeding range over last 25 years, or the longer-term period, moderate (25-49%) decline in UK non-breeding population over last 25 years, or the longer-term period, rare breeder; 1–300 breeding pairs in UK, rare non-breeders; less than 900 individuals, localised; at least 50% of UK breeding or non-breeding population in 10 or fewer sites, but not applied to rare breeders or non-breeders, internationally important; at least 20% of European breeding or non-breeding population in UK (NW European and East Atlantic Flyway populations used for non-breeding wildfowl and waders respectively).

*** Green list: species that occur regularly in the UK but do not qualify under any or the above criteria

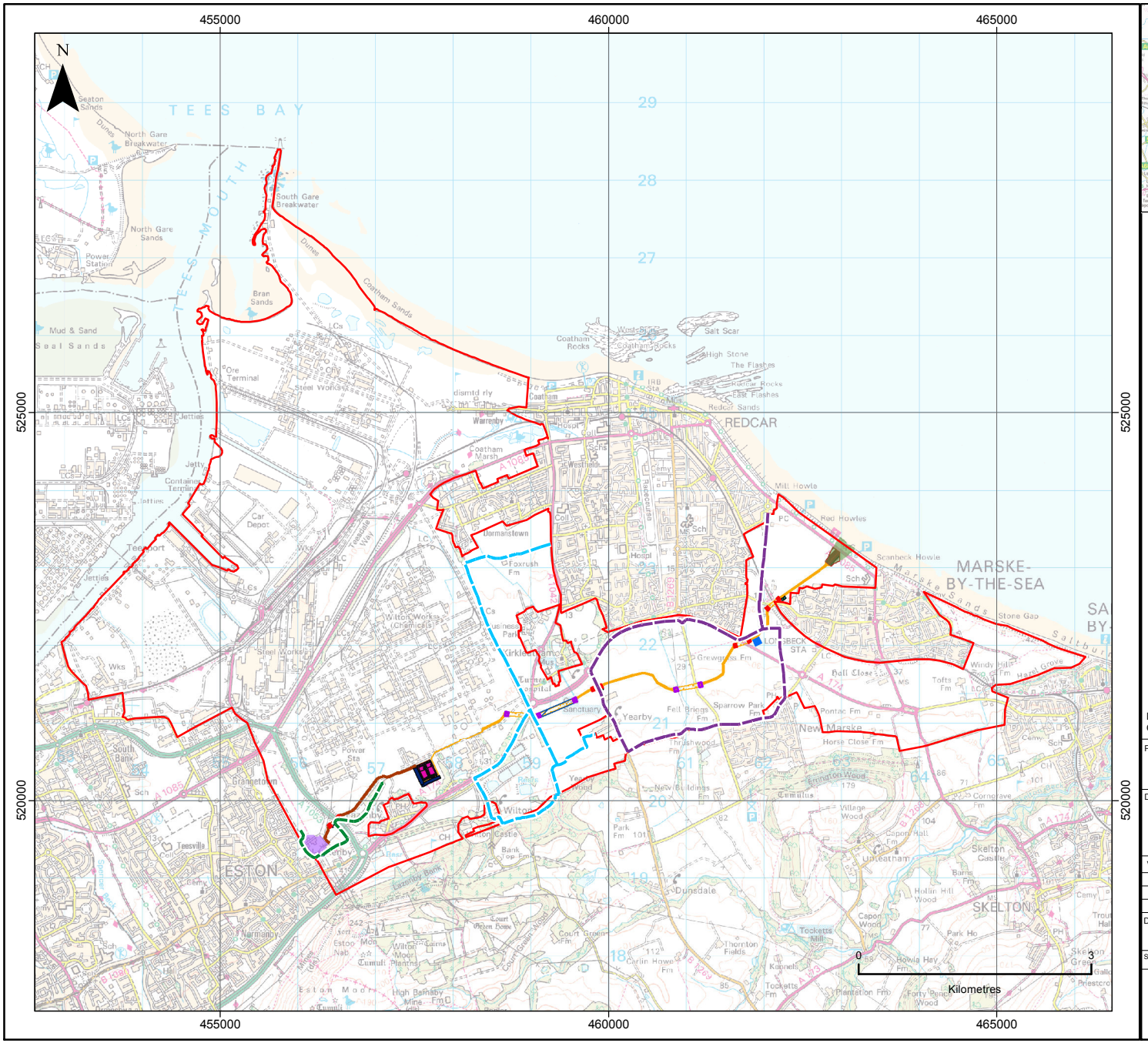
4.6.5 The total number of species recorded during surveys is not considered particularly high when the length of the transect is considered and the fact that each was repeated three times. In line with the survey methodology used, a (small) proportion of the species recorded were non-breeding birds that might have been foraging on or flying over the site.

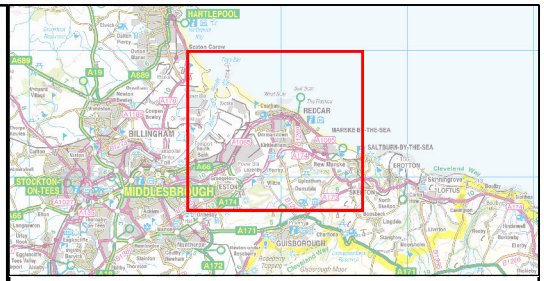
4.6.6 On surveys between the landfall and Yearby (Transect 1), of the 45 species recorded, this included a total of 22 Red and Amber listed species, or 49% of the species recorded, which is the highest of the three transects. Lackenby (Transect 3) only recorded 43% Red and Amber listed species and at Yearby to Wilton (Transect 2), only 36%.

4.6.7 Along Transect 1, ten of the Red list species recorded were breeding including house sparrow *Passer domesticus*, grey partridge *Perdix perdix*, skylark *Alauda pratensis*, spotted flycatcher *Muscicapa striata*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, marsh tit *Poecile palustris*, linnet *Carduelis cannabina* and yellowhammer *Emberiza citrinella*. Overall the species were representative of urban habitats and farmland, including declining farmland bird species such as grey partridge, skylark, linnet and yellowhammer (all Red listed). There were also a number of species typically associated with wetland and scrub, such as the Red listed marsh tit, and the Amber listed willow warbler *Phylloscopus trochilus*, whitethroat *Sylvia communis* and reed bunting *Emberiza schoeniclus*. Of note were the six to eight pairs of bullfinch *Pyrrhula pyrrhula* and linnet recorded as probable breeders.

4.6.8 An additional species of note recorded on Transect 3 was a grasshopper warbler *Locustella naevia,* a species often associated with damp scrub, although only present as one pair of possible breeders.

4.6.9 Given the primarily industrial and intensive agricultural land within the study area, this breeding bird fauna is considered valuable. Furthermore, it is clear that relatively small areas of scrub and wetland contribute significantly to the mosaic of habitats including hedgerows, woodlands, grasslands and arable fields. Scrub habitats are often treated as being of low ecological value but at Teesside they would appear to have value in supporting a relatively rich breeding birds fauna considered to be of County value.





LEGEND

- Onshore scoping study area
- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation

Breeding Bird Survey

- Transect 1
- Transect 2
- Transect 3

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.15: Breeding Bird Survey Overview

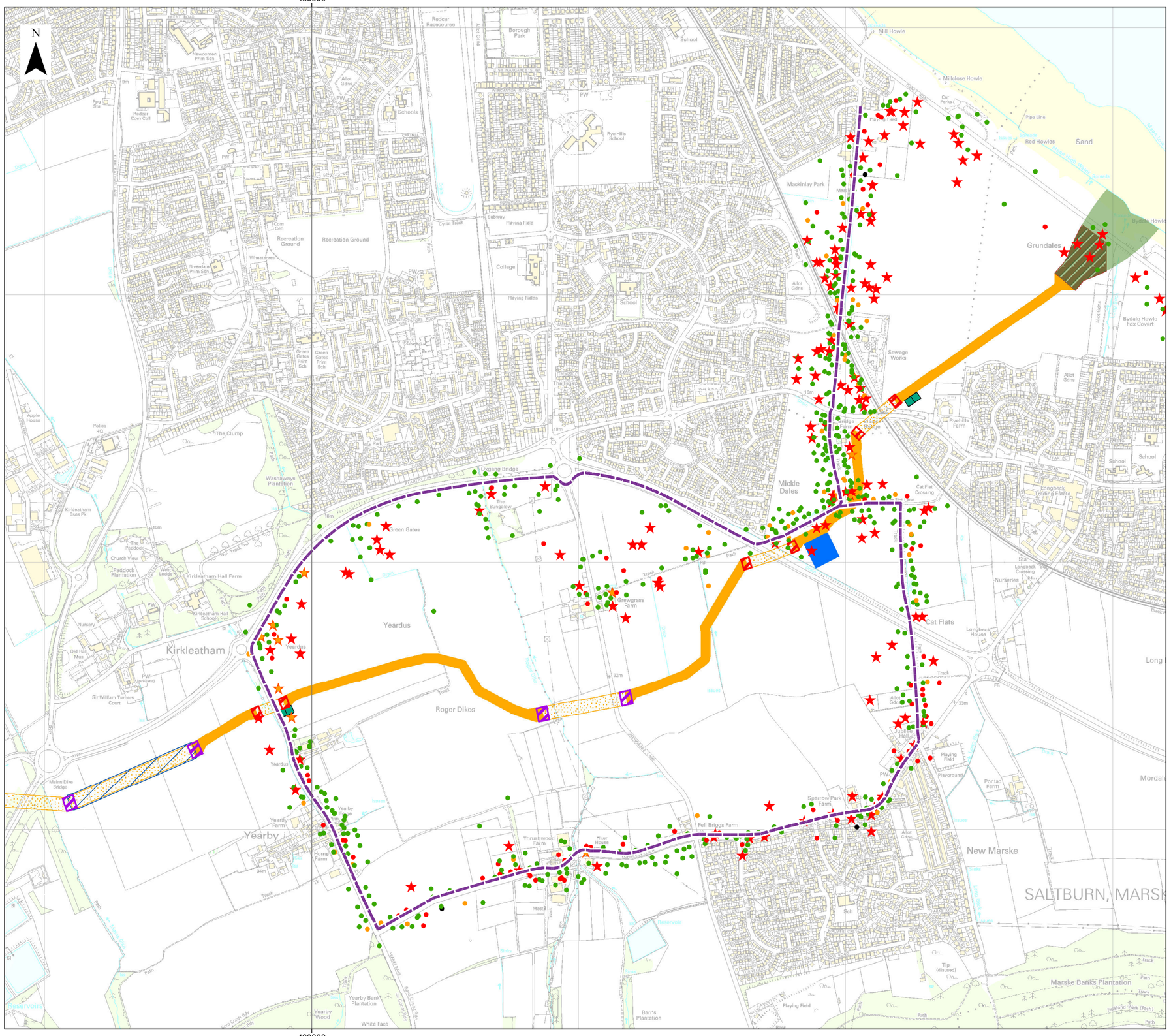
VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
5	22/01/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-215**

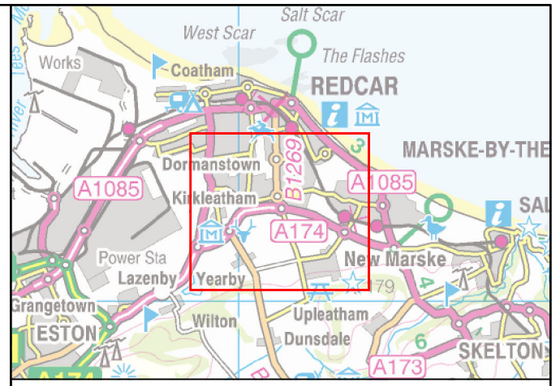
SCALE	1:75,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

460000



460000



LEGEND

- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)

Breeding Bird Survey

- Breeding Bird Survey Transect 1

Birds of Conservation Concern

- No status
- Red
- Amber
- Green

Birds of Conservation Concern and UK BAP Species

- Red
- Amber

0 250
Metres

Data Source:
Ordnance Survey © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

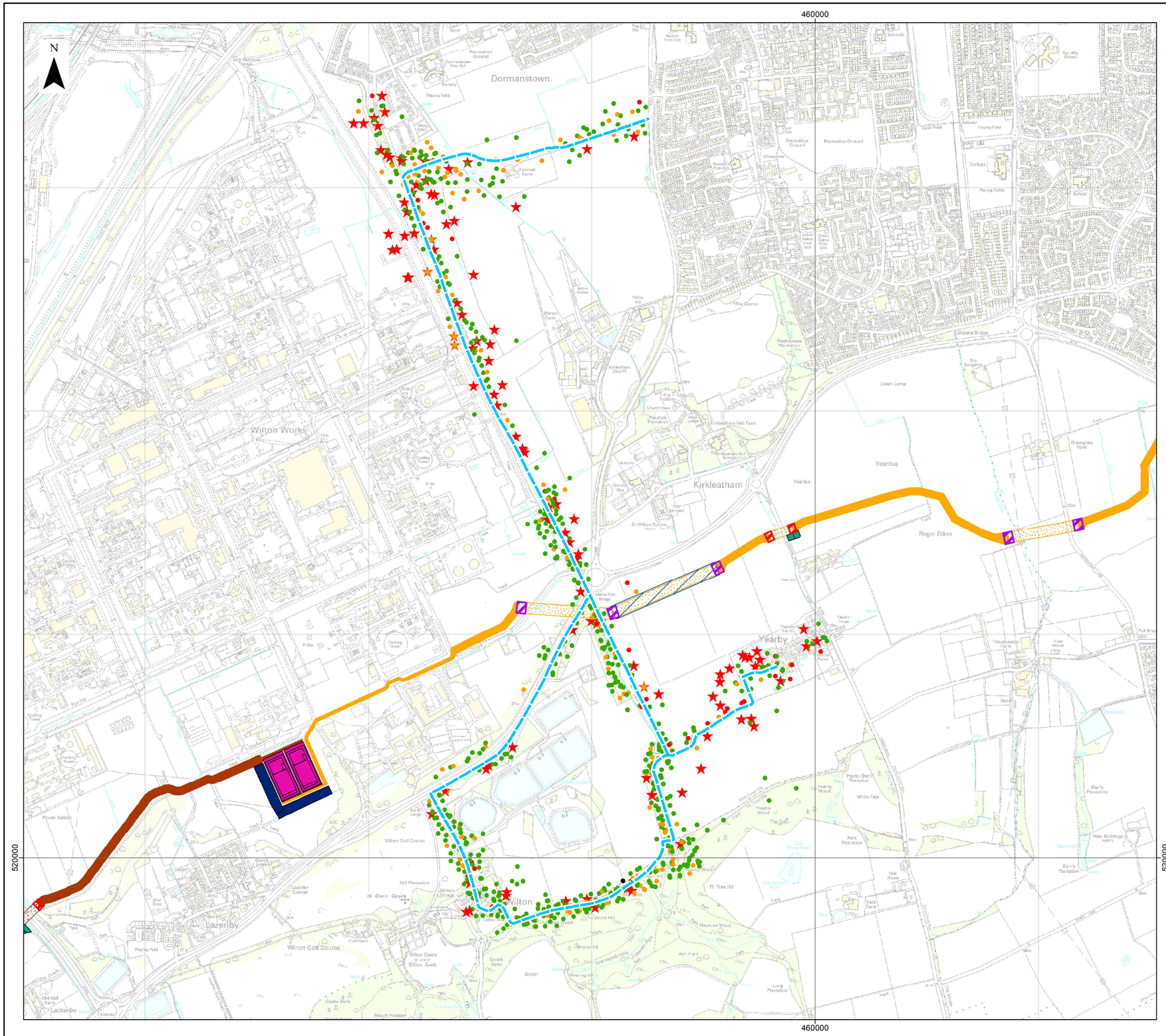
Fig 4.16: Breeding Birds Survey Transect 1 Visits 1 - 3

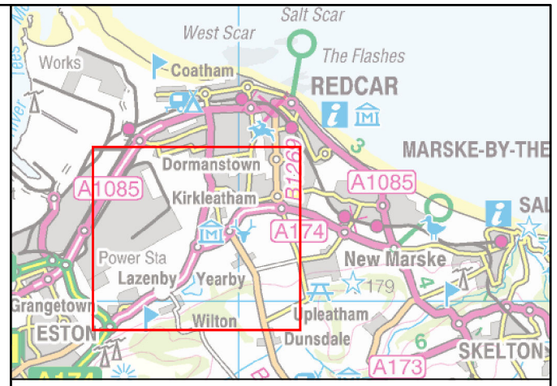
VER	DATE	REMARKS	Drawn	Checked
1	12/07/2013	Draft	SW/LC	SDS
2	31/07/2013	Draft	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-216**

SCALE	1:15,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND





LEGEND

- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)

Breeding Bird Survey

- Breeding Bird Survey Transect 2

Birds of Conservation Concern

- No status
- Red
- Amber
- Green

Birds of Conservation Concern and UK BAP Species

- Red
- Amber

0 250
Metres

Data Source:
Ordnance Survey © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

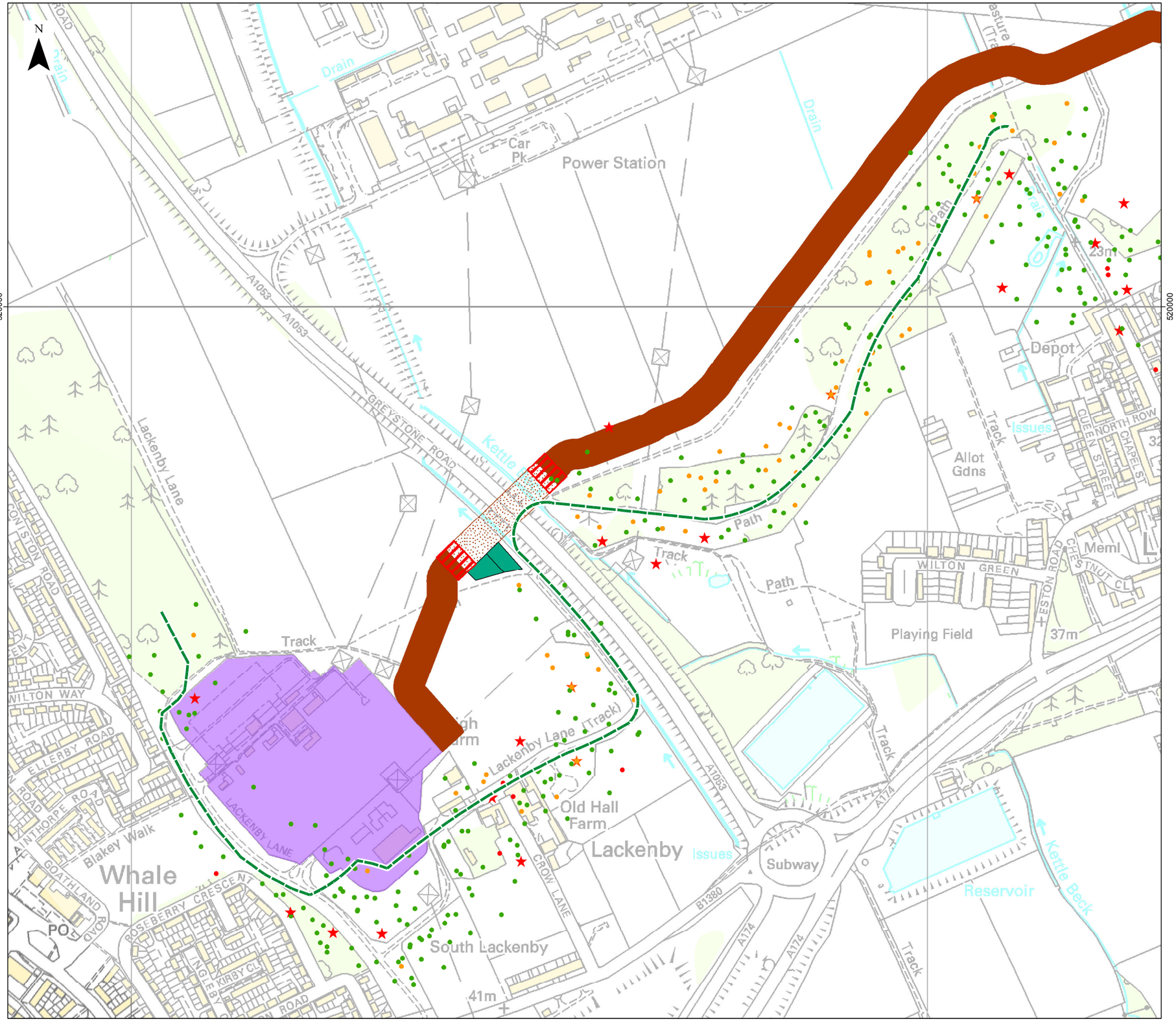
Fig 4.17: Breeding Birds Survey Transect 2 Visits 1 - 3

VER	DATE	REMARKS	Drawn	Checked
1	12/07/2013	Draft	SW/LC	SDS
2	31/07/2013	Draft	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-217**

SCALE	1:17,500	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND



LEGEND

- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B intermediate construction compound (784m²)
- Lackenby 400kV substation

Breeding Bird Survey

- Breeding Bird Survey Transect 3

Birds of Conservation Concern

- Red
- Amber
- Green

Birds of Conservation Concern and UK BAP Species

- Red
- Amber

0 250

Metres

Data Source:
Ordnance Survey © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Fig 4.18: Breeding Birds Survey Transect 3 Visits 1 - 3

VER	DATE	REMARKS	Drawn	Checked
1	12/07/2013	Draft	SW/LC	SDS
2	31/07/2013	Draft	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-218**

SCALE	1:5,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND

Wintering birds

Overview

4.6.10 Wintering bird surveys were undertaken during the winters of 2011-2012, 2012-2013 and 2014. The results of the surveys are provided in the three technical reports: Wintering Bird Surveys November 2011 – March 2012 (Peak Ecology 2013a), Autumn Passage and Wintering Birds September 2012 – March 2013 (Peak Ecology 2013g) and Golden Plover and Lapwing at the Landfall (Peak Ecology 2014a). In addition, a detailed desk study assessment was undertaken specifically in relation to the golden plover and lapwing at the landfall location (Peak Ecology 2014a).

4.6.11 The surveys undertaken between 2011- 2012 included four survey sites to cover all potential landfall options under consideration, with each site surveyed up to eight times over the winter period. Site 2 – Redcar to Marske-by-the-Sea was taken forward as the preferred area for landfall and therefore the results of only Site 2 have been discussed below.

4.6.12 Following refinement of the landfall location, the surveys between 2012 – 2013 were undertaken at two sites: Site 1 – Coastal fields at the landfall (Redcar to Marske-by-the-Sea) and Site 2 – inland arable fields between Yearby and Wilton. Site 1 corresponds to the same area surveyed in 2011-2012 which was referred to during that survey period as Site 2. A total of 14 surveys were undertaken on each site between September 2012 and March 2013, to include autumn passage surveys.

4.6.13 Following further consultation regarding the draft ES with Natural England in December 2013, an additional desk study and additional surveys were undertaken specifically for golden plover and lapwing. The surveys were undertaken between January 2014 and February 2014 at Site 1 – the Coastal fields at the landfall site (Redcar to Marske-by-the-Sea).

4.6.14 The results of the key field survey data have been summarised and are provided on **Figure 4.19** to **Figure 4.21**. For golden plover and lapwing, a summary of the detailed desk assessment undertaken for these species in 2014 is included within the section 'Site 1 Coastal fields between Redcar and Marske-by-the-Sea'.

Field survey results

2011 – 2012 surveys of the landfall (Redcar to Marske-by-the-Sea)

4.6.15 During the 2011 - 2012 surveys of the site between Redcar and Marske-by-the-Sea, a total of 33 species were recorded during all surveys. The conservation status of the 33 species is shown in **Table 4.9**. Some species are listed on BoCC list and UKBAP and/or Schedule 1.

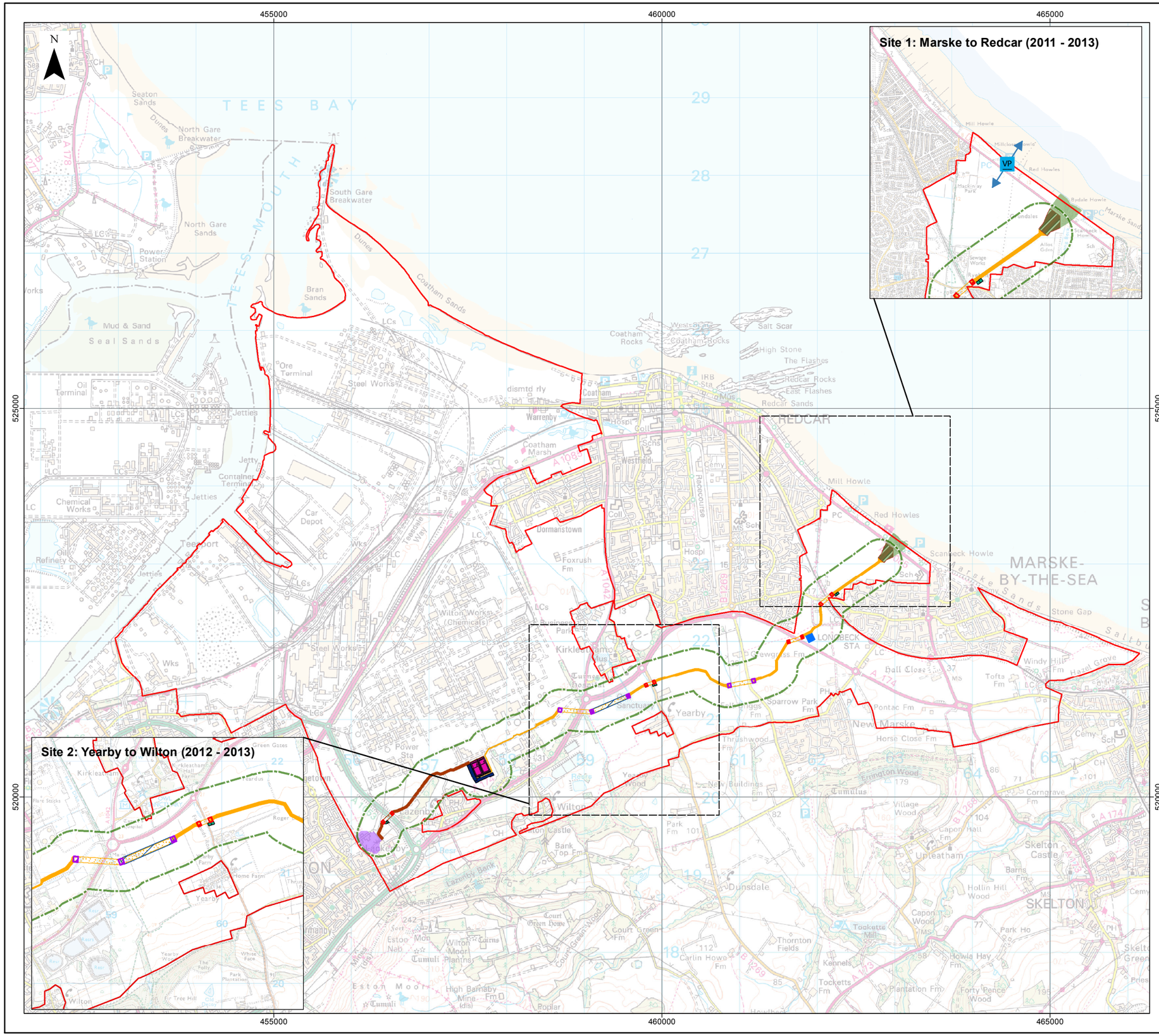
Table 4.9 Numerical summary of wintering bird data (2011 – 2012)

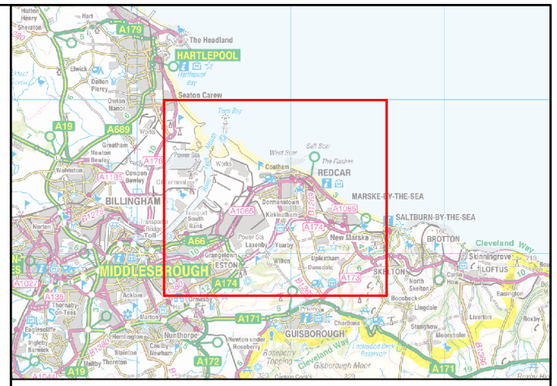
Conservation status	Site 2 – Redcar to Marske-by-the-Sea
Red listed	7 (21%)
Amber listed	17 (52%)

Conservation status	Site 2 – Redcar to Marske-by-the-Sea
Green listed	8 (24%)
Schedule 1 protected	2 (6%)
UK BAP species	7 (21%)
Feral or introduced species	1 (3%)
Total number of species	**33**

4.6.16 The inshore sea-watch surveys included reasonable numbers of bird registrations inshore on most visits and also on the beach area at low water. The beach was disturbed by walkers and birds were therefore mobile. Red-throated divers *Gavia stellata* and shag *Phalacrocorax aristotelis* were present on most visits mainly feeding inshore as were great-crested grebe *Podiceps cristatus*, razorbill *Alca torda* and guillemot *Uria aalge* and on one occasion a flock of 54 common scoters *Melanitta nigra* were present.

4.6.17 During surveys, a large winter flock of golden plover *Pluvialis apricaria* were recorded in November 2011 (3,500) and December 2011 (3,300). Lapwings were also present in good numbers with a flock of up to 800 recorded in November 2011. Both species were typically present in one large flock in the Grundales fields (**Figure 4.20**). This area appeared to have the shortest grass sward and crop height of the whole field area. Golden plover were not present after December, but small numbers of lapwing remained, often congregating on the adjacent school fields.





LEGEND

- Cable route 250m buffer
- Onshore scoping study area
- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- VP Vantage Point
- Direction of Observation

0 — 3 Kilometres

Data Source:
Ordnance Survey © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Fig 4.19: Wintering Bird Survey overview

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-219**

SCALE	1:50,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

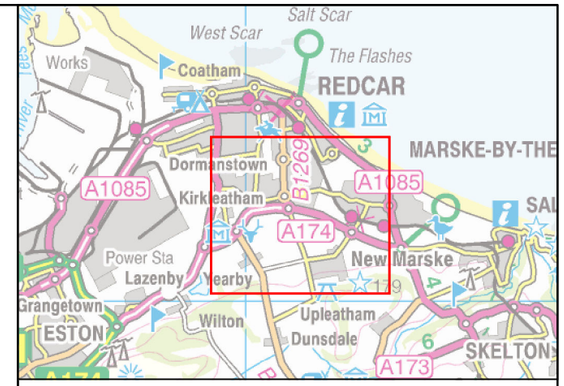
FOREWIND

460000

Birds of Conservation Concern count (2014 only)

1:10,000

N



LEGEND

- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)

Birds of Conservation Concern count (2011 - 2014)

- European Golden Plover (Amber Status) - Count < 100
- Northern Lapwing (Red Status) - Count < 100
- European Golden Plover (Amber Status) - Count > 100
- Northern Lapwing (Red Status) - Count > 100

0 — 1

Kilometres

Data Source:
Ordnance Survey © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.20:
Wintering bird survey: Lapwing & Golden Plover distribution & density

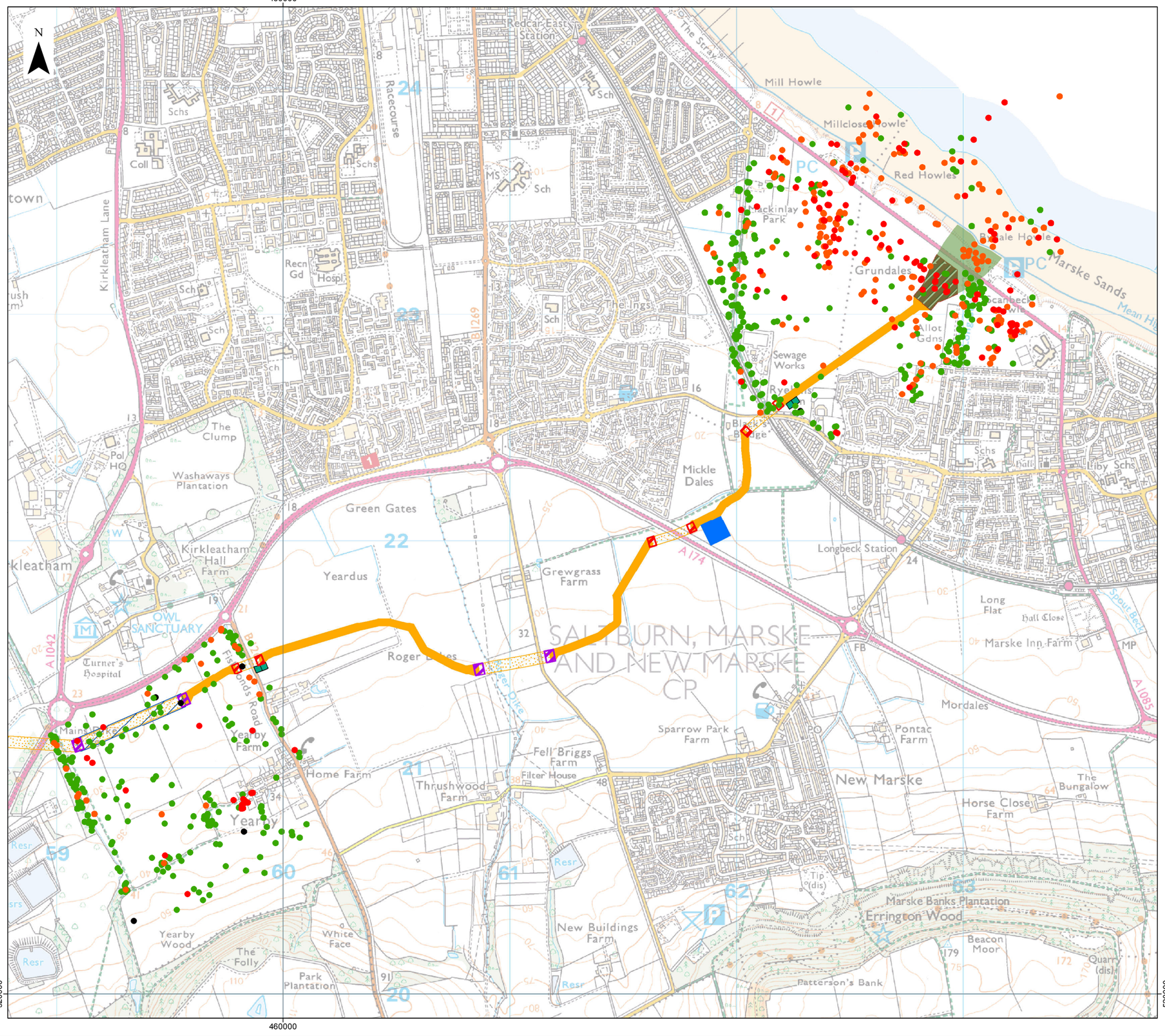
VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
4	21/02/2014	Pre-DCO submission review	SW	SDS

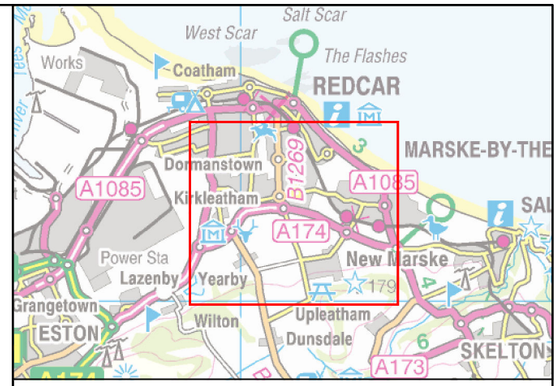
DRAWING NUMBER: **F-ONL-MA-220**

SCALE	1:15,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND

460000





LEGEND

- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)

Birds of Conservation Concern

- No Status
- Red
- Amber
- Green

0 — 1 Kilometres

Data Source:
Ordnance Survey © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Fig 4.21: Wintering Bird Survey Overview (Presence)

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW/LC	SDS
3	30/08/2013	Submit for PEI3	SW	SDS
4	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-221**

SCALE	1:17,500	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND

2012 – 2013 Surveys of the Landfall and Cable Corridor

Site 1 Coastal fields between Redcar and Marske-by-the-Sea

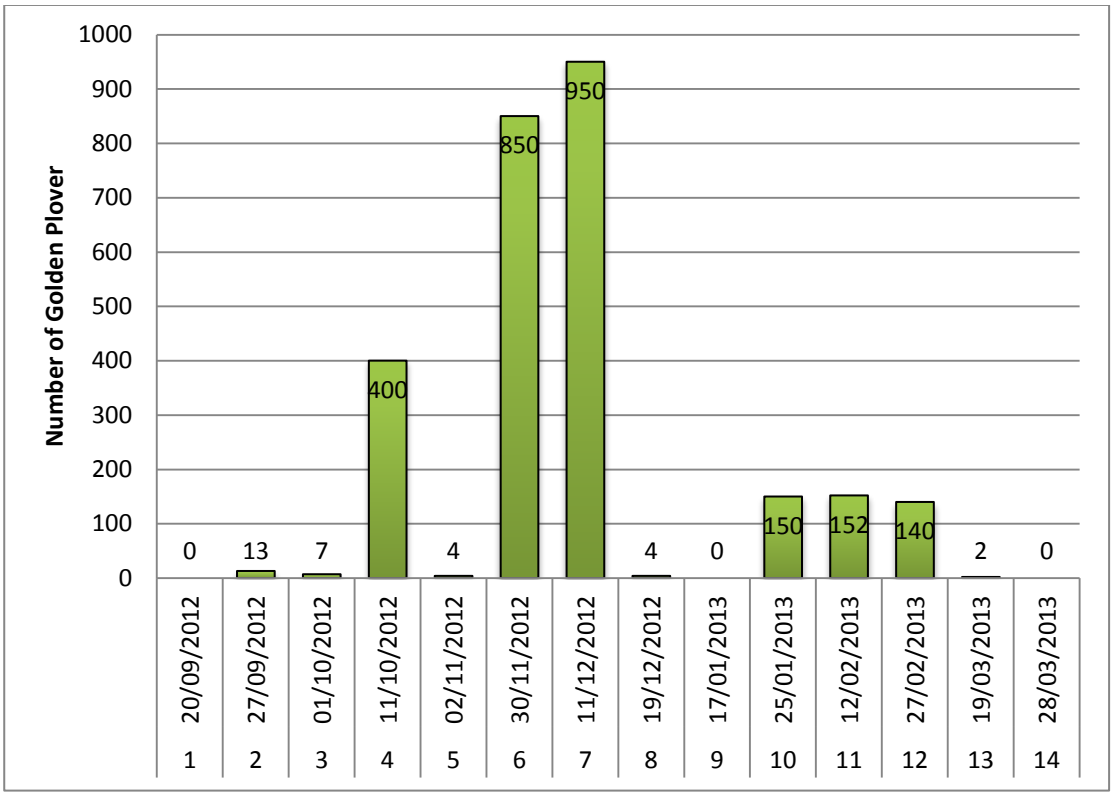
4.6.18 The results of the 2012 - 2013 surveys of the coastal fields at the landfall (Site 1) recorded a total of 69 species with the categories of conservation interest summarised in **Table 4.10**. Some species are listed on both a BoCC list and UKBAP and/or Schedule 1.

Table 4.10 Numerical summary of wintering bird survey data (2012 – 2013)

Conservation status	Site 1 (Coastal fields between Redcar and Marske-by-the-Sea)
Red listed	11
Amber listed	31
Green listed	24
Schedule 1 protected	3
UK BAP species	10
Feral or introduced species	3
Total number of species	**69**

4.6.19 Key species recorded during the surveys included golden plover, lapwing, starling, redwing *Turdus iliacus* and fieldfare *Turdus pilaris*.

4.6.20 Golden plover were recorded on 11 out of 14 survey visits with fluctuating abundance between late September and early March (**Graph 4.2**) with a peak (950) in the early December visit. Between the two survey visits in December, there was significant rainfall causing the fields to become waterlogged and consequently only four birds were recorded on the second December survey. No golden plover were recorded after early March and only low numbers were recorded in late January and February.



Graph 4.2 Total number of golden plover per survey at landfall arable fields

4.6.21 Lapwing were also recorded in high numbers, mixed within the flock of golden plover on a total of 12 of the 14 survey visits. Whilst numbers of lapwing were significantly lower than that of golden plover, the fluctuations in numbers mimicked that of the golden plover. Numbers of lapwing were at their highest during November 2012 with 200 birds recorded within the eastern half of the arable fields.

4.6.22 Starlings were recorded at the coastal car park on all 14 survey visits. Numbers were at their highest during the two surveys undertaken in September and November 2012 (1,011, 3,884, 2,000, and 1,710 respectively). All other visits recorded birds in much lower numbers fluctuating between seven and 700.

Site 2 Field along cable corridor between Yearby and Wilton

4.6.23 A total of 36 species were recorded, of which three were Schedule 1, seven were UKBAP, seven Red Listed, nine Amber Listed and a further 16 species which were Green listed, with another four introduced or feral bird species recorded.

4.6.24 A total of ten of the birds within the species list for this area were only recorded as flying over the site. These were herring gull *Larus argentatus*, black-headed gull *Chroicocephalus ridibundus*, common gull *Larus canus*, kestrel *Falco tinnunculus*, mallard *Anas platyrhynchos*, pink-footed goose *Anser brachyrhynchus*, common buzzard *Buteo buteo*, raven *Corvus corax*, and Canada goose *Branta canadensis*.

4.6.25 Of the 26 other species recorded, 13 of these birds are associated with the hedgerows surrounding the arable fields and the adjacent areas of woodland habitat. Many of these birds are resident birds which are likely to stay within the surrounding area even outside of the breeding season.

4.6.26 In general, all bird species were recorded in low numbers on all of the survey visits to the inland fields with the exception of mixed flocks of feral pigeon *Columba livia*, wood pigeon *Columba palumbus* and carrion crow *Corvus corone*.

4.6.27 On three visits, up to four quail *Coturnix coturnix* were recorded within the field margins of the arable field. Whilst quail have been known to be in the area during the summer and autumn within Redcar and Cleveland, they are a migratory species leaving the UK in the winter months. As such, the small numbers recorded within the inland fields are likely to be birds that were not ready for migration at the end of the autumn and have stayed.

2014 Desk Study and Surveys of the Landfall

Site 1 Coastal fields between Redcar and Marske-by-the-Sea

Review of designated sites for nature conservation

4.6.28 In response to the feedback given by Natural England in December 2013 (**Table 2.2**), a detailed desk based assessment was undertaken which collates all the existing known information on golden plover and lapwing abundance within the vicinity of the coastal landfall site (**Figure 4.19**). A detailed review of the field survey results from the 2011 - 2012 and 2012 - 2013 surveys has also been undertaken.

4.6.29 A total of eight statutory designated sites were recorded within 10km of the cable landfall area, of these five (Teesmouth and Cleveland Coast SPA, Tees and Hartlepool Foreshore and Wetlands SSSI, South Gare and Coatham Sands SSSI, Seal Sands SSSI and Seaton Dunes and Common SSSI) are designated in part, due to the habitats they contain supporting important assemblages of migratory and overwintering wildfowl and wading birds.

4.6.30 In particular, Tees and Hartlepool Foreshore and Wetlands SSSI (approximately 3.6km north west) comprises several coastal areas which are an integral part of the complex of wetlands, estuarine and maritime sites supporting the internationally important population of wildfowl and waders on the Tees Estuary. In winter, counts have shown that proportions of the total Tees population of lapwing and golden plover have been recorded on Saltholme Pool (approximately 11.5km west) and Dorman's Pools (11km west).

4.6.31 Seal Sands SSSI are the only extensive area of intertidal mudflats, with tidal channels on the East coast of England between the Lindisfarne National Nature Reserve to the north and the Humber Estuary to the south, a distance of 200 miles. These mudflats are of great ornithological importance attracting large numbers of migratory wildfowl (c. 4,000) and wading birds (c. 24,000) especially during the winter months. The mudflats are used as feeding ground by wading birds including lapwing.

Review of existing records

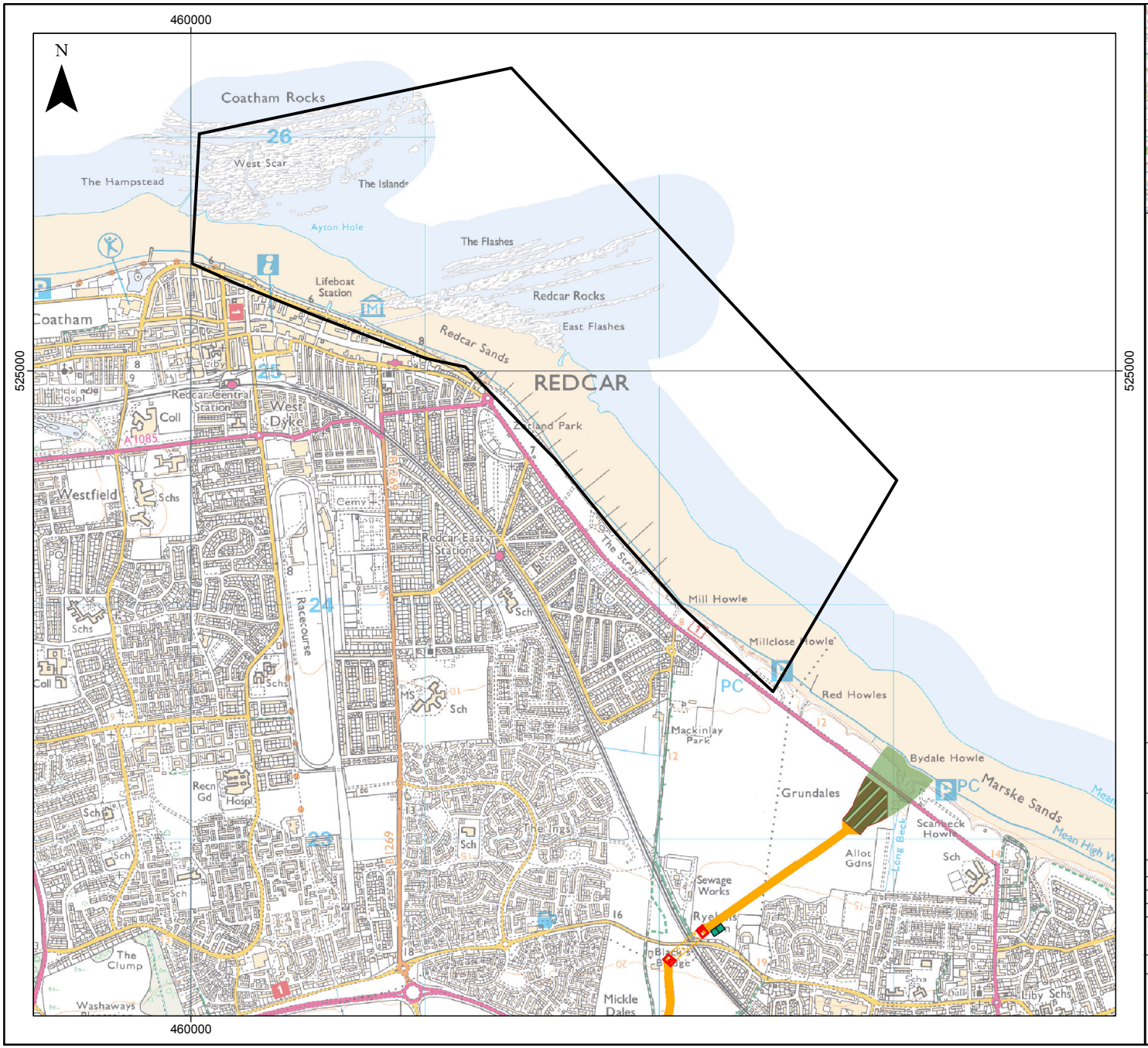
4.6.32 Within the desk study information provided by Teesmouth Bird Club (Peak Ecology 2013c), a description of the fields at the landfall was given, including a brief statement on the use of the fields by golden plover and lapwing, as detailed below:

4.6.33 Being so close to the coast, the fields are a magnet for feeding waders, particularly during periods of hard weather and at high tide. Flocks of over 2,000 Lapwings and 1,700 Golden Plovers have been recorded, while small numbers of Ruff are seen during the autumn. Historically, Stead (1969) stated that "large flocks" of Golden Plovers favoured these fields. A personal count by the author of this report on 12th February 2008 produced 1,000 Golden Plovers, 1,500 Lapwings and 500 Wood Pigeons, all of which were feeding or roosting. Turnstone, Oystercatcher, Redshank and Curlew also use the fields for feeding, particularly after heavy rain when muddy pools collect. Whooper Swans, Pink-footed Geese and occasional Brent Geese drop in as they pass through on migration and over the years the site has attracted a number of national rare and scarce birds, including American Golden Plover, Buff-breasted Sandpiper, Dotterel and Short-toed Lark.

4.6.34 As part of the original desk study search no specific data was provided with regards to dates and counts of birds.

4.6.35 The BTO were consulted with regards to WeBS data on golden plover and lapwing within the nearest and most appropriate site to the landfall. There is a WeBS site which has been created along the coastline at Redcar. The southern tip of the WeBS site falls just inside the landfall area for the project. On request of the data, BTO informed Peak Ecology that although the site had been created, BTO had not yet received any data for the area, and expect that no surveys have been conducted in this area to date.

4.6.36 **Figure 4.22** shows the area of land covered by the Redcar to Marske WeBS area.



LEGEND

- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- Redcar to Marske WeBS area

0 — 1

Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.22: Redcar to Marske WeBS area

VER	DATE	REMARKS	Drawn	Checked
1	24/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-222**

SCALE	1:25,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

4.6.37 Teesmouth Bird Club provided all their up-to-date data on the numbers of golden plover and lapwing at the landfall coastal fields (**Figure 4.19**). A total of ten records of golden plover and five records of lapwing were returned covering a period from November 2005 to October 2012. Records from 2013 had not yet been submitted by most members of the bird club. Of the records returned, golden plover had a peak count of 2,300 in November 2005. Three records were returned within the January – March period, 1200 golden plover during January 2008, 1000 birds in February 2008 and 300 golden plover recorded in January 2011. Of the five lapwing records returned, lapwing had two peak counts of 1,500 during February 2008 and October 2011. Only two records were returned within the January – March period. The first record being the peak count in February 2008, and another record of 300 lapwings during January 2011.

Review of field surveys 2011 - 2012 and 2012 - 2013

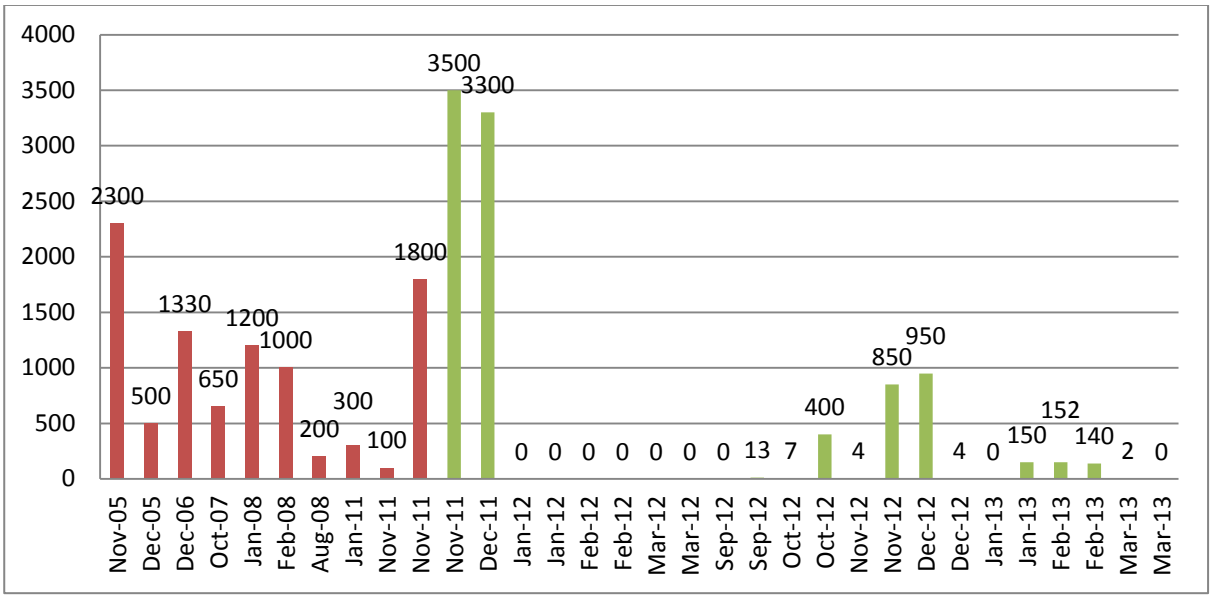
4.6.38 As part of the detailed desk study undertaken in relation to golden plover and lapwing, the previous field survey data (2011 - 2012 and 2012 - 2013) obtained for the species was reviewed.

4.6.39 Of a total of 22 survey visits, golden plovers were recorded on 13 survey visits. Peak counts of 3,500 golden plover were recorded in November 2011, and the second highest count of 3,300 in December 2011. These were the only two visits during the 2011/2012 wintering bird survey when golden plover were recorded. During the 2012/ 2013 surveys lower numbers of golden plover were recorded over a prolonged period. Peak counts were recorded in December 2012 of 950, and secondly in November 2012 (850).

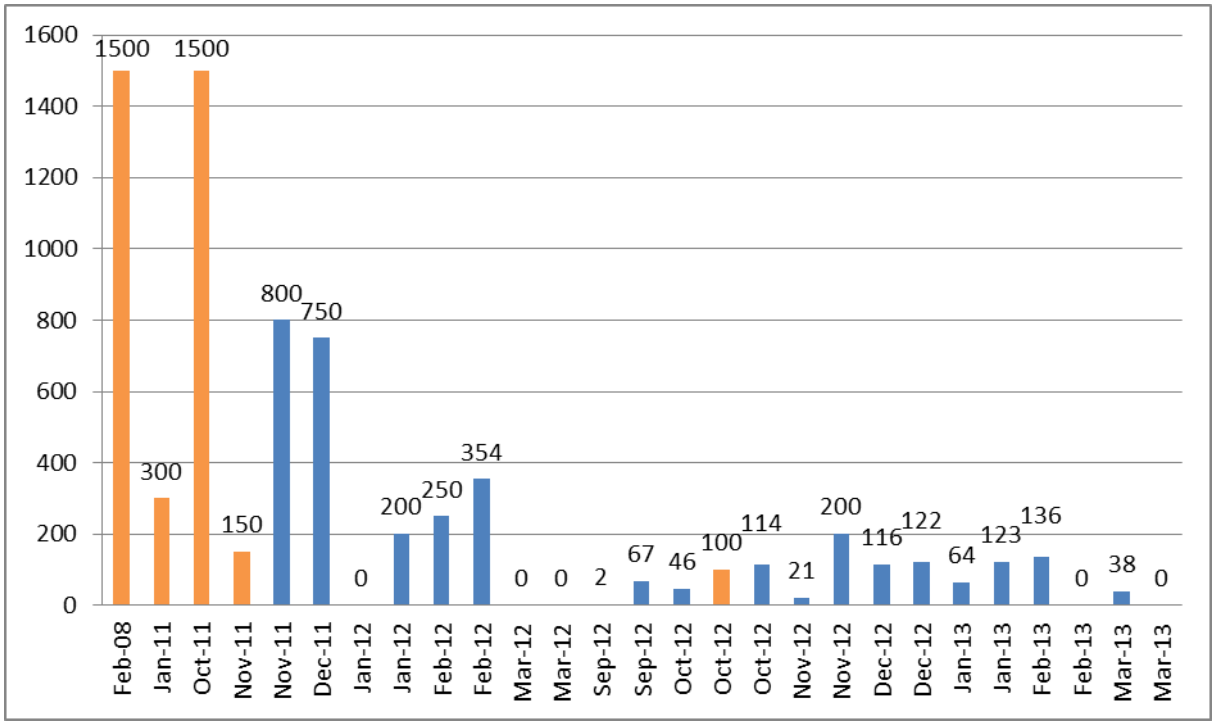
4.6.40 Lapwing were recorded on 17 out of 22 survey visits. Lapwing were also recorded in high numbers mixed within the flock of golden plover.

4.6.41 A peak count of 800 lapwing were recorded in November 2011, with the second highest count of 750 in December 2011. Lapwings were recorded on many of the survey visits, however sometimes in relatively low numbers. Whilst numbers of lapwing were significantly lower than that of golden plover, the fluctuations in numbers mimicked that of the golden plover.

4.6.42 A summary of the desk study data obtained from Teesmouth Bird Club has been combined with the field study results for 2011 - 2012 and 2012 - 2013 (**Graph 4.3** and **Graph 4.4**). Please note, records appearing in red refer the desk study data obtained from Teesmouth Bird Club, whilst those records in green are from data collated during field surveys.



Graph 4.3 Combined golden plover records and fields survey data for 2011 - 2012 and 2012 - 2013



Graph 4.4 Combined lapwing records and fields survey data for 2011 - 2012 and 2012 - 2013

Potentially available alternative habitats

4.6.43 The detailed desk study also located similar alternative habitat in the proximity of the landfall coastal fields that could be used by golden plover and/or lapwing.

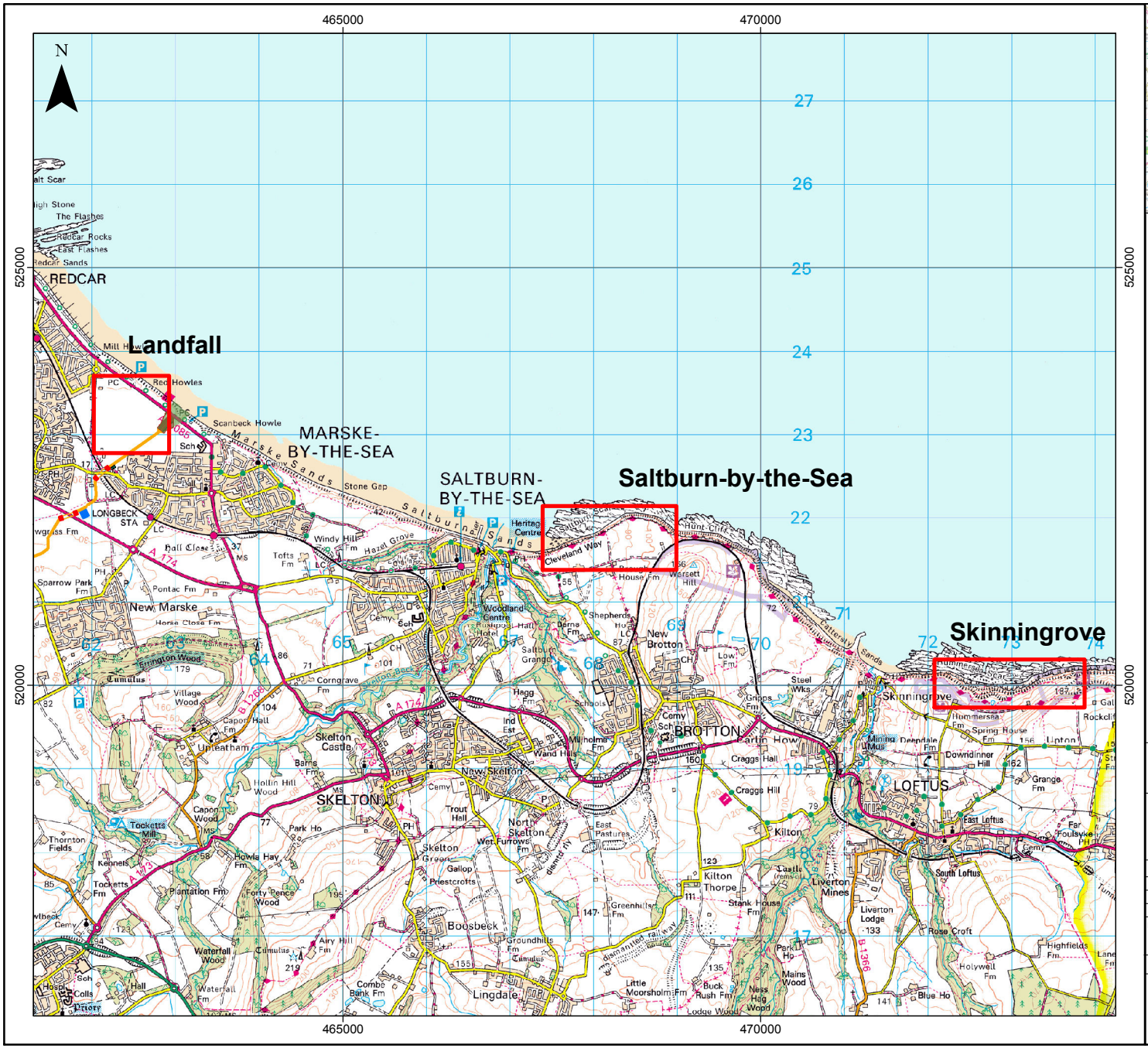
4.6.44 Many of the arable fields at the landfall during the winter of 2012 - 2013 had a tall stubble remaining from the crop planted earlier in the year. This has been

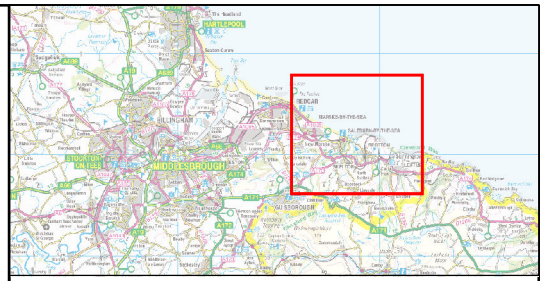
due to the farmer being unable to plough the fields at the end of the crop season due to a very wet autumn leaving much of the fields heavily water logged.

4.6.45 From the aerial photography and map assessment, there appears to be a limited number of arable fields, along the coastline in this area, with many fields appearing to be improved grassland grazed by either sheep, cattle or horses. The nearest arable fields to the site appear to be to the east of Saltburn-by-the-Sea (NZ 678 214) (**Figure 4.23**), and differs from the landfall, as the fields are located at the top of a steep bank compared to the lower lying landfall. These fields are approximately 5km from the landfall.

4.6.46 The second area lies further still, to the east of Skinningrove (NZ 721 199) (**Figure 4.23**). Whilst these fields are approximately 9.7km from the landfall there are closer to sea level and therefore more similar to the landfall than those fields located at Saltburn-by-the-Sea.

4.6.47 The remainder of the coastal area appears to be largely residential housing and improved grassland to the east of the landfall, whilst to the north, the area is dominated by industrial areas, with the exception of Coatham Marsh LNR, which contains relict salt marsh and coastal wetland habitats.





LEGEND

- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- Locations for potentially available alternative habitats

0 2

Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.23: Locations for potentially available alternative habitats

VER	DATE	REMARKS	Drawn	Checked
1	24/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER:

F-ONL-MA-223

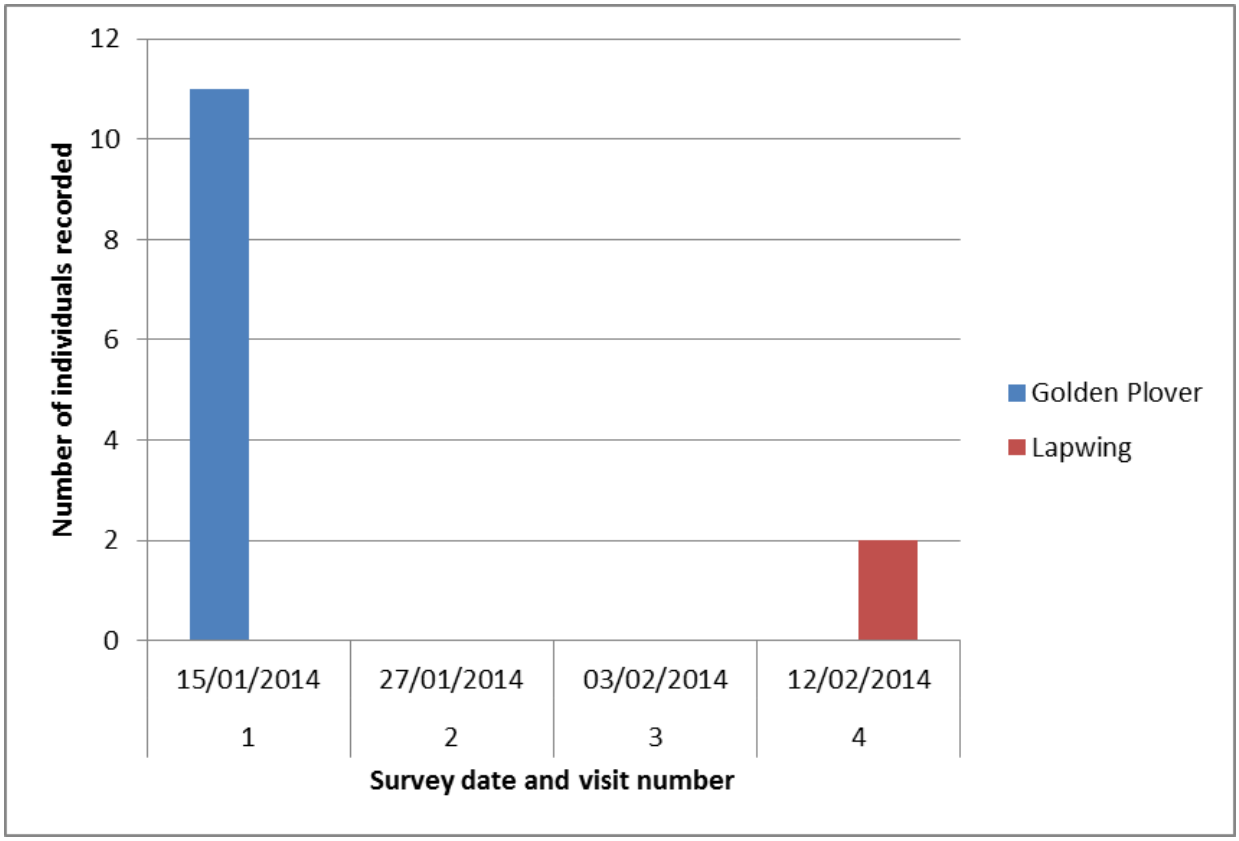
SCALE	1:70,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

Review of field surveys 2014

4.6.48 A total of four survey visits were conducted between January and February 2014 (two in January 2014 and two in February 2014). The surveys revealed very low numbers of both golden plover and lapwing. **Graph 4.5** below provides the results of each of the survey visits at Site 1, whilst **Figure 4.20** shows the locations of each of the golden plover and lapwing registrations.

4.6.49 During visits 1, 2 and 4 to Site 1, lapwing were recorded adjacent to the fields, on amenity grassland at the rugby club and Bydales School. Two lapwing were recorded at each of visits 1 and 2, while 12 lapwing were recorded on visit 4.



Graph 4.5 Numbers of individual golden plovers and lapwings recorded during surveys undertaken during 2014

Evaluation

4.6.50 The survey results indicate that much of the autumn passage and wintering bird interest within the study area is centred on the arable fields at the landfall, located between Redcar and Marske-by-the-Sea (covered by surveys of Site 2 during 2011 - 2012 surveys and Site 1 during 2012 – 2013 and 2014). The fields further inland were limited in the number of birds they supported with many species recorded only as flying over the site.

4.6.51 Large flocks of golden plover and lapwing move around and utilise the large arable fields at the landfall; this is probably dictated by the state of the arable field at the time. Golden plover prefer open, short vegetation (less than 10cm), for example fields left as stubble during autumn and winter. These provide an

abundance of food in the form of soil and ground-surface invertebrates, including earthworms, leatherjackets, beetles and spiders (Kirby *et al*. 2000).

4.6.52 The number of golden plover recorded during the winter of 2011 – 2012 was far higher than during the winter of 2012 – 2013. Although the peak numbers recorded were lower during the 2012 – 2013 surveys their presence was recorded over a longer duration. Speculatively, this could be due to the elevated number of golden plover consuming the ground invertebrates available in a much shorter time, therefore depleting potential food resources quickly, and forcing the birds to move on to other foraging areas.

4.6.53 During the surveys undertaken in 2014 at the Redcar to Marske Coastal Fields, golden plovers were present on only one of the four survey visits, and a total of 11 birds were recorded altogether. Similarly lapwings were present within the fields on only one of the four survey visits, and 2 birds were recorded altogether. In addition, lapwings were recorded in amenity grassland adjacent to the fields, and 16 birds were recorded in total over four survey visits. By combining the numbers for golden plover and lapwing recorded in 2014, surveys in 2011-2012 and 2012 – 2013, the average numbers of these birds is reduced to 28 birds for golden plover and 74 birds for lapwing.

4.6.54 In both survey seasons, the highest counts of golden plover and lapwing occurred in the months of November and December. A similar finding was recorded at nearby Saltholme in 2008 (Joynt *et al*. 2008). In addition, the desk study and surveys undertaken for golden plover and lapwing in 2014 provided evidence of low numbers of both species from January to March generally in the Redcar to Marske Coastal Fields.

4.6.55 Teesmouth Bird Club reported that the WeBS recorded a maximum of 1,200 golden plover in the early months of 2008 on the arable fields at the landfall, with 2000 and 2300 golden plover recorded in November and December 2008 at Saltholme Pools (Joynt *et al.* 2008), showing that there are other areas close by which also appear to support large numbers of golden plover. The site falls within an area of interest for the Teesmouth Bird Club. The site is known to the club as the ‘Redcar to Marske Coastal Fields Important Bird Area’. It should be noted that this is not associated with the RSPB and BirdLife International Important Bird Area protected area network.

4.6.56 With regards to lapwing and golden plover, the JNCC selection guidelines for SPAs under the European Union Birds Directive, for non-breeding birds, work on a 1% of UK population threshold. The UK population of lapwing is thought to be in the region of 1,500,000 birds and so the peak count of 800 birds represents 0.05%, i.e. 5/100th of the 1% threshold (Stroud *et al*. 2001).

4.6.57 However, the UK population of golden plover is thought to be in between 200,000 and 250,000 birds and so the 3,500 birds recorded during 2011 - 2012 represent 1.4% to 1.7% of the UK population, and in 2012 - 2013 having recorded 950, 0.4% to 0.5% of the UK population (Stroud 2001). In practice, non-breeding populations of over 2,500 birds have been interpreted by JNCC as qualifying for SPA status. Of the 22 UK SPAs for which non-breeding golden

plover is a qualifying species, the average number of birds is 3,056 (Stroud *et al.* 2001).

4.6.58 The closest SPA to the study area is the Teesmouth and Cleveland Coast SPA, and neither lapwing nor golden plover are qualifying species for this site. The coastal fields close to the landfall are also not included within the boundary of any nearby SSSIs. The closest of which is the Redcar Rocks SSSI which is over 2km north west of the study area.

4.6.59 The survey results indicate that there is significant variation between years, but on a precautionary basis, the wintering bird fauna associated with the coastal fields at the landfall is considered to be of Regional value.

4.7 Species of principal importance – badgers

4.7.1 Whilst there was evidence of badgers within the study area the overall level of badger activity was low. Two records for badger were located within 500m of the cable route corridor, south of the A174 and north of Wilton village.

4.7.2 A main sett was recorded on the west side of Mains Dike, approximately 200m from the study area (Peak Ecology 2013c). Due to the distance of the sett from the proposed works, no impacts are anticipated on the sett and badgers are not taken forward to the impact assessment stage. However best practice mitigation has been included in Section 6.5.

4.8 Species of principal importance – great crested newts

Overview

4.8.1 Existing records of great crested newts were supplied by ERIC within the study area and a total of 13 water bodies were identified within the study area. Field surveys (including Habitat Suitability Index (HSI) assessment and presence/likely absence surveys) were undertaken on the waterbodies and the results of the surveys are provided in the 'Great Crested Newt Survey Technical Report' (Peak Ecology 2013d).

4.8.2 The location of the waterbodies and desk study records are shown on **Figure 4.24**.

Existing Records

4.8.3 No records for great-crested newts were provided within 1km of the cable route corridor.

Field surveys

4.8.4 In total, 13 water bodies were identified, made up of 11 ponds and two ditches. The ponds varied from farm ponds and hollows to large man-made storage ponds or reservoirs. The ditches were drainage channels in and around the arable fields, well managed and re-trenched regularly.

4.8.5 The majority of terrestrial habitat surrounding water bodies was of low suitability for great crested newts. Suitable terrestrial habitat within the study area included hedgerows, treelines, scrub, broadleaved woodland and semi-

improved grassland, and in places these habitats form small corridors of connective habitat between waterbodies.

4.8.6 Due to access restrictions, HSI assessments were only undertaken for ten of the 11 ponds. Owing to difficulties in applying the HSI to ditches, the two ditches were assessed less formally. Of the 10 ponds assessed, three were classed as 'Good', two as 'Average', one as 'Below Average' and four as 'Poor'. Both ditches were classed as being of 'Low Potential'. Ponds with high HSI scores are more likely to support great crested newts than those with low scores.

4.8.7 Following the HSI surveys, presence/likely absence surveys were undertaken of 12 waterbodies. Surveys followed standard survey guidance (English Nature 2001) and no great crested newts were detected during any of the surveys.

4.8.8 Due to the likely absence of great crested newts within the study area, great crested newts are not considered further within this assessment.

4.9 Species of principal importance – reptiles

Overview

4.9.1 Desk study records of reptiles were provided by the ERIC and North East Reptile and Amphibian Group, and field surveys were undertaken of eight areas in spring 2013. The results of the surveys are provided in the 'Reptile Survey Technical Report' (Peak Ecology 2013f).

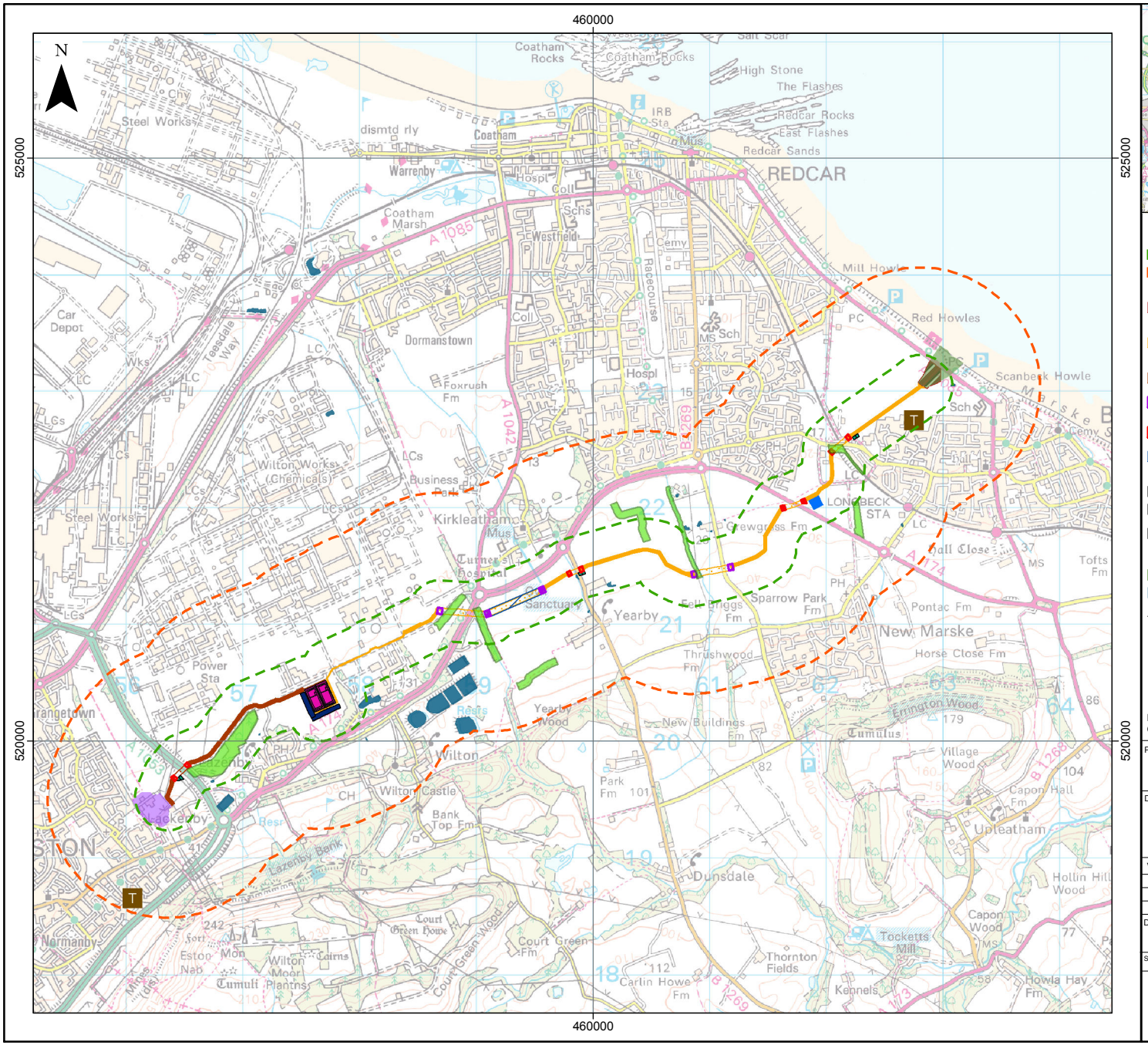
Existing records

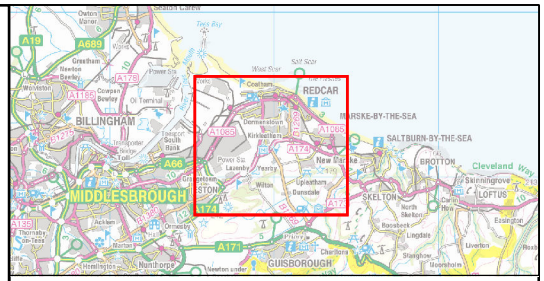
4.9.2 The ERIC and North East Reptile and Amphibian Group provided a total of 19 records of common species of reptiles (slow worm *Anguis fragilis,* viviparous (or common) lizard *Zootoca vivipara* and adder *Vipera berula*); however no records were from within the 1km study area.

Field survey results

4.9.3 Habitats with the potential to support reptile populations were relatively limited in extent, although there were small areas scattered throughout the study area. A total of eight areas (**Figure 4.24**) were selected for reptile field survey using artificial refugia. The surveys were undertaken following standard survey guidance in suitable weather conditions and were checked seven times between mid-March to mid-June 2013.

4.9.4 No reptiles were found during the reptile surveys. Reptiles are considered likely to be absent from the study area and are not considered further within this assessment.





LEGEND

- Onshore cable route 250m buffer
- Amphibian and reptiles desk study area
- Teesside A&B cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- Reptile survey area
- Great Crested Newt Ponds Surveyed

Amphibian and reptile records

- T Common Toad

0 — 2

Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.24: Amphibian (including great crested newts) and reptile records and survey locations

VER	DATE	REMARKS	Drawn	Checked
2	31/07/2013	Draft	SW	SDS
3	22/01/2014	Submit for PEI3	SW	SDS
5	21/02/2014	Pre-DCO submission review	SW	SDS

DRAWING NUMBER: **F-ONL-MA-209**

SCALE	1:50,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND

Identification of VER (Species)

4.9.5 Based on the desk study and field survey results to date, a valuation of species and species groups, using an estimation of the geographical scale of importance is presented in **Table 4.11**.

4.9.6 Only those receptors considered important at or above the County level are taken forward as VERs.

Table 4.11 Identification of Valued Ecological Receptors (Species)

Receptor	Key features	Geographical scale of importance	Rationale
Wintering birds	The Redcar to Marske Coastal Fields.	Regional	The wintering bird fauna at Redcar to Marske Coastal Fields included peak counts of 3,500 golden plover which represents over 1% of the UK wintering population. However, this area has not been included within the internationally important Teesmouth and Cleveland Coast SPA or within any of the multiple nationally important SSSIs within the Teesside area.
Breeding birds	The mosaic of habitat present, including woodlands, grassland, agricultural land, scrub and wetland features throughout the study area.	County	The breeding bird fauna contains Red and Amber list BoCC such as grey partridge, skylark, linnet, bullfinch, marsh tit, grasshopper warbler and yellowhammer.
Bats	A small number of hedgerows, woodland and watercourses have been identified as being important to bats.	County	The bat species recorded were all common, and activity levels have been variable but in general, the landscape in the survey areas provided numerous opportunities for foraging and commuting bats. All species (except common pipistrelle) are listed as priority species on the LBAP. All bat species are listed on the UKBAP and on Section 41 of the NERC Act 2006.

4.9.7 The VER that have been taken forward to the impact assessment phase include receptors valued as a minimum at County level and include:

- Wintering birds;
- Breeding birds; and
- Bats.

4.9.8 Mitigation for badgers and otter have been outlined in Section 6.5 due to the legal protection afforded to the species and animal welfare considerations.

5 Assessment of Impacts – Worst Case Definition

5.1 Introduction

5.1.1 This section establishes the realistic worst case scenario for each category of impact as a basis for the subsequent impact assessment. This involves both a consideration of the relative timing and phasing of construction and operation of the two projects, as well as the particular design parameters of each project that define the Rochdale Envelope for this particular assessment.

5.1.2 Full details of the range of development options being considered by Forewind are provided within **Chapter 5**. For the purpose of the EcIA, the key project parameters which form the realistic worst case are set out in **Table 5.1**.

5.1.3 Only those design parameters with the potential to influence the level of impact are identified.

5.1.4 The realistic worst case scenarios identified here are also applied to the Cumulative Impact Assessment. When the worst case scenarios for the project in isolation do not result in the worst case for cumulative impacts, this is addressed within the cumulative section of this chapter (see Section 10) and summarised in **Chapter 33 Cumulative Impact Assessment**.

5.2 Construction phasing scenarios

5.2.1 **Chapter 5** provides details of the nine representative construction phasing scenarios associated with the onshore construction of Dogger Bank Teesside A & B.

5.2.2 The specific timing and phasing of the construction of the two projects will be determined post consent, and therefore a Rochdale Envelope approach has been undertaken for the Environmental Impact Assessment (EIA). There are four key principles that form the basis of the Rochdale Envelope, relating to how the projects will be built. These are:

- The two projects may be constructed at the same time, or at different times;
- If built at different times, either project could be built first;
- If built at different times, the duration of the gap between the end of the first project to be built, and the start of the second project to be built may vary from overlapping, to up to five years; and
- Partial installation of elements of the second project may be completed during the construction of the first project, e.g. through the use of ducts to provide conduits for a later cable installation.

5.2.3 To determine which construction phasing scenario is the worst realistic case for a given receptor, two types of effect exist with the potential to cause a maximum level of impact on a given receptor:

- Maximum duration effects; and
- Maximum peak effects.

5.2.4 To ensure that the Rochdale Envelope incorporates all nine of the possible onshore construction phasing scenarios (as outlined in **Chapter 5**), both the maximum duration effects and the maximum peak effects are assessed for each onshore receptor.

5.2.5 Furthermore, the option to construct each project in isolation is also considered ('Build A in isolation' and 'Build B in isolation'), enabling the assessment to identify any differences between the two projects. The four construction phasing scenarios for Dogger Bank Teesside A & B considered within the assessment for land use and agriculture are therefore:

i. Build Dogger Bank Teesside A or build Dogger Bank Teesside B in isolation – either project is considered to have the same impact as the land take footprint will be identical for either project;

ii. Build Dogger Bank Teesside A & B concurrently – provides the worst 'peak' impact and maximum working footprint;

iii. Build Dogger Bank Teesside A, gap of up to five years, build Dogger Bank Teesside B (sequential) – provides the worst 'duration' of impact. The length of gap is considered to represent the worst case is defined in **Table 6.1**; and

iv. Build Dogger Bank Teesside A and install conduits for Dogger Bank Teesside B, gap of up to five years, install cables for Dogger Bank Teesside B in conduits.

5.2.6 For scenario (i) the only material difference between Dogger Bank Teesside A & B relates to the location of the converter stations. As such, a single assessment is presented for the single project but where differences occur, e.g. distances to nearest receptors, these are identified.

5.2.7 Within the sequential scenario (scenario iii) there is not considered to be any material difference whether Dogger Bank Teesside A is built first or whether Dogger Bank Teesside B is built first. As such, a single assessment is presented for this sequential scenario.

5.2.8 For the conduits scenario (iv) there is no significant difference in the working width or scale of the impact compared to the concurrent scenario (ii) but there is a requirement for impacting small areas of land twice (when access to the conduits is required for the second project). Thus there is the potential for an extended period of disturbance or a second separate disturbance event, depend on the timing. However, the ecological effects of the conduits option are considered to always be less than the maximum duration attributable to

sequential construction (scenario iii) or the maximum peak (scenario ii). Thus the conduits option is not considered further.

5.2.9 For each potential onshore impact only the worst case construction phasing scenario for 'two projects' is presented, i.e. either concurrent or sequential. The justification for what constitutes the worst case is provided in the impact assessment discussion (Sections 6 – 8).

5.2.10 As such, the construction scenarios presented within the impact assessment sections of this chapter (Sections 6 – 8) are:

i. Single project; and

ii. Two projects – concurrent or sequential.

5.3 Operating scenarios

5.3.1 **Chapter 5** provides details of the operational scenarios for Dogger Bank Teesside A & B. Flexibility is required to allow for the following three scenarios:

- Dogger Bank Teesside A to operate on its own;
- Dogger Bank Teesside B to operate on its own, and
- For the two projects to operate concurrently.

5.3.2 For the terrestrial ecology assessment there is not considered to be a material difference between either Dogger Bank Teesside A or Dogger Bank Teesside B operating on its own. As such, only one assessment for the single project scenario is presented and is considered representative for whichever project is operating in isolation.

5.4 Decommissioning scenarios

5.4.1 **Chapter 5** provides details of the decommissioning scenarios for Dogger Bank Teesside A & B. Exact decommissioning arrangements will be detailed in a Decommissioning Plan (which will be drawn up and agreed with DECC prior to construction), however for the purpose of this assessment it is assumed that decommissioning of Dogger Bank Teesside A & B could be conducted separately, or at the same time.

Table 5.1 Realistic worst case scenario for ecological impact assessment

Impact	Realistic worst case scenario	Rationale
Construction		
All impacts	*All scenarios* • Where there is flexibility in the type of ditch crossing to be used (either HDD or open trench) an open trench method has been assumed for the worst case.	Trenching will always represent a worst case compared to avoiding the feature.
	Single project • Maximum construction period of converter station = 36 months; • Maximum construction period of cable route	Maximum ranges provided within **Chapter 5 Project Description**.

Impact	Realistic worst case scenario	Rationale
	(high voltage directional current (HVDC) cable system) of 24 months; • Maximum construction period of cable route (high voltage alternating current (HVAC) cable system of 18 months; • Maximum HVDC corridor = approximately 7km x 18m; • Maximum HVAC corridor = approximately 2km x 20m; • Maximum HVDC primary site compounds = 1 x 5000m^2; • Maximum HVDC intermediate site compounds = 2 x 784m^2; • Maximum HVAC intermediate site compounds = 1 x 784m^2; • Maximum HVDC HDD major compounds = 5 x 2000m^2; • Maximum HVDC HDD minor compounds = 6 x 1200m^2; • Maximum HVAC HDD minor compounds = 2 x 1200m^2; and • Maximum converter station site (during construction) = 5ha.	
	Sequential build • Maximum construction period of converter station of 36 months x 2 = 72 months (with no gap); • Maximum construction period of cable route (HVDC cable system) = 24 months x 2 = 48 months; • Maximum construction period of cable route (HVAC cable system) = 18 months x 2 = 36 months; • Maximum HVDC corridor = approximately 7km x 36m; • Maximum HVAC corridor = approximately 2km x 39m; • Maximum HVDC primary site compounds = 2 x 5000m^2; • Maximum HVDC intermediate site compounds = 4 x 784m^2; • Maximum HVAC intermediate site compounds = 2 x 784m^2; • Maximum HVDC HDD major compounds = 10 x 2000m^2; • Maximum HVDC HDD minor compounds = 12 x 1200m^2; • Maximum HVAC HDD minor compounds = 4 x 1200m^2; • Maximum converter station site (during construction) = 10ha; and • Land surrounding the jointing pits for the second project will be excavated twice.	Maximum values provided

Impact	Realistic worst case scenario	Rationale
	Concurrent build • Maximum construction period of converter station of 36 months; • Maximum construction period of cable route (HVDC cable system) of 24 months; • Maximum construction period of cable route (HVAC cable system) of 18 months; • Maximum HVDC corridor = approximately 14km x 36m; • Maximum HVAC corridor = approximately 4km x 39m; • Indicative maximum duration of construction works at landfall 38 weeks; • Maximum HVDC primary site compounds = 2 x 5000m^2; • Maximum HVDC intermediate site compounds = 4 x 784m^2; • Maximum HVAC intermediate site compounds = 2 x 784m^2; • Maximum HVDC HDD major compounds = 5 x 4000m^2; • Maximum HVDC HDD minor compounds = 6 x 2400m^2; and • Maximum HVAC HDD compound = 2 x 2400m^2.	
Operation		
All impacts	*Single project* • Maximum total operational land take = approximately 4ha (approximately 2ha converter site and approximately 2ha mitigation screening).	Maximum ranges provided within **Chapter 5 Project Description**.
	Concurrent or sequential • Maximum total operational land take = approximately 8ha (approximately 4ha converter stations and approximately 4ha screening).	Maximum ranges provided within **Chapter 5 Project Description**.
Decommissioning		
All impacts	• Buried cable system left *in situ*; • Dismantling and removal of above ground electrical equipment; • Removal of any building services equipment; • Demolition of the buildings and removal of security fences; and • Landscaping and reinstatement of the site.	N/A

6 Assessment of Impacts During Construction

6.1 Introduction

6.1.1 Reference should be made to **Chapter 5** of the ES for details of the activities proposed during the construction phase. However, in summary, the activities considered likely to impact on terrestrial ecology are:

- Construction associated with the onshore transition bays;
- Construction of onshore cable system including jointing bays – installation techniques include open cut trenching and HDD;
- Construction of new onshore converter stations, associated infrastructure and landscaping;
- Temporary construction compounds / laydown areas; and
- Temporary construction of access tracks and haul roads.

Embedded mitigation

6.1.2 The site selection process has identified a preferred onshore cable route and converter stations site which minimises direct impacts to known environmental constraints. This has resulted in the avoidance of ecological features wherever possible and reduced the overall extent of potential ecological impacts. In particular:

- The routing of the cable deliberately avoided statutory designated sites and any woodlands or ponds visible on Ordnance Survey mapping;
- The project has benefitted from early ecological input and an iterative EIA process, where emerging survey findings have fed into ongoing design work. In a number of instances minor route shifts have been made on ecological grounds;
- Extensive consultation with statutory and non-statutory consultees has taken place, and consultee comments and feedback have been properly considered during the design process; and
- 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. This collaboration will extend to the detailed design of general (re)planting schedules; see also Section 7.4 of **Chapter 21 Landscape and Visual Impact Assessment**.

6.1.3 The embedded mitigation measures are not listed or considered further within this chapter. For example, where the cable has been routed around woodland, the potential effects of routing through the woodland have not been considered because this is not part of the final scheme.

6.2 Assessment of impacts (habitats)

Designated sites – Redcar to Saltburn Coast LWS

Single project

6.2.1 Redcar to Saltburn Coast LWS covers both the sandy foreshore and the low boulder clay cliffs with maritime vegetation and is considered to be of County level importance. The latter are included due to their vascular plants and coastal grassland and the foreshore is included within the designation due to its wintering bird assemblage. Impacts on the wintering bird assemblage are considered in paragraph 6.3.16.

6.2.2 The cable route will come ashore and cross a section of the non-statutory designated site. HDD will be undertaken to avoid impacts on the majority of the site and the coastal grassland and maritime vegetation would be unaffected. It is anticipated that the HDD will start from the transition bay in the coastal fields (outside the boundary of the LWS) and exit in the seabed in the sub-tidal area (outside the boundary of the LWS). However, if this is not possible, it will be necessary for the exit point for the HDD to be located in the inter-tidal area (sandy foreshore). It this case, it may be necessary for a degree of open trenching and the installation of two cofferdams (10x10x3m) to maintain the joint transition bays, within the inter-tidal area, which will directly impact on the beach area within the LWS.

6.2.3 Incidental impacts could result during HDD operations including contractor encroachment outside the working area resulting in trampling of vegetation. There is also the potential for dust generation from the works resulting from excavations, construction and earthworks which could be deposited on the vascular plants within the designated site. The impacts of dust on receptors are considered in **Chapter 30 Air Quality** in the ES.

6.2.4 The magnitude of the impacts is considered to be low (0.1% of the overall area of the LWS) and temporary. The mitigation measures outlined below in **Table 6.1** will be undertaken to minimise the construction impacts on the habitats within the designated site.

Table 6.1 Habitats within the Redcar to Saltburn Coast LWS – mitigation measures

Mitigation measures
• 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; • No storage of materials or machinery will be permitted outside the working width and within the boundary of the LWS; • 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; • 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'; and • Reinstatement of habitats affected by the works following construction.

6.2.5 When the size of the LWS site is considered and with the implementation of the mitigation measures, the magnitude of the impact will reduce to negligible and **negligible** residual impacts are predicted on the habitats within the designated site.

Two projects – concurrent

6.2.6 The worst case scenario is considered to be Dogger Bank Teesside A & B being constructed at the same time due to the additional area that will be required for the section of cable trenching and for the installation of four cofferdams (10x10x3m) within the sandy foreshore. The impacts on beach habitat will be temporary with all areas reinstated on completion of the works.

6.2.7 Similar potential impacts are anticipated with incidental encroachment outside the working area and dust generation during the works. The increased area of temporary habitat damage will result in a slightly higher magnitude of effect (medium), however, the overall impact is still predicted to be temporary and only a small area affected in the context of the total area of the site.

6.2.8 The mitigation measures detailed in **Table 6.1** will be implemented, reducing the magnitude to low and overall the additional area will result in a **minor adverse** residual impact on the habitats within the designated site.

6.3 Habitats with biodiversity value

Hedgerows

Single project

6.3.1 Hedgerows were identified as being important at the County scale. Predominantly, they are species-poor and none qualified as 'important' under the Hedgerow Regulations. They are considered an integral part of the agricultural landscape and help to provide connectivity between semi-natural habitat features and habitat resources for such species as bats and farmland birds.

6.3.2 The construction phase of the project will require removal of sections of hedgerow to allow the cable route to pass through. Within the study area, a total of 96 hedgerows totalling 22.3km were recorded. Throughout the whole length of the route, a total of 15 hedgerows will be crossed by the cable. This will include 12 crossings for the HVDC cable route (18m wide) and three crossings for the HVAC which has a working width of 20m. HDD will avoid all impacts on three of the hedgerows along the HVDC cable route. The cable route crosses some hedgerows on a diagonal angle and overall, approximately 300m of hedgerow will require removal. The impact is certain to occur, will be highly localised, temporary and reversible. The magnitude of the impact is considered to be low.

6.3.3 To reduce construction impacts, mitigation outlined in **Table 6.2** will be adhered to.

Table 6.2 Hedgerows – mitigation measures

Mitigation measures
• The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint; • 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; and • Following construction, the hedgerow will be reinstated as soon as possible. Hedgerows will be re-planted with native, regionally appropriate, species rich planting grown locally.

6.3.4 With the implementation of the mitigation above, the magnitude of the impact will reduce to negligible and it is considered that the construction of a single project is anticipated to have **negligible** residual impacts on hedgerows which are of importance at the County Level. In the long-term, once the hedgerows are reinstated and mature, with the inclusion of the species rich planting, a **minor beneficial** impact is anticipated.

Two projects – concurrent and sequential

6.3.5 With either project scenario, double the length of hedgerow would require removal to allow for cable crossings, i.e. approximately 600m. No additional impacts are anticipated as a result of the construction of both projects. The magnitude of effect is considered to rise but remain as low.

6.3.6 Providing the mitigation in **Table 6.2** is implemented, the doubling in extent of temporary hedgerow loss is considered to be a **minor adverse** impact in the short term and similarly to the single project scenario, a **minor beneficial** impact in the long-term, with reinstatement of all stretches.

6.4 Assessment of impacts (species)

Bats

Single project

6.4.1 The bat species recorded were common and widespread species, and activity levels were variable but it is clear that overall, the hedgerow network is used by bats for feeding and commuting. Overall, bats have been valued as of County importance. No roosts were identified during surveys within the study area and no impacts are therefore anticipated on roosting bats.

6.4.2 The construction impacts are limited to indirect effects associated with the temporary loss of hedgerows (total of approximately 300m across the 15 crossings) and night-time security lighting of the converter stations and site compounds. Standard construction works along the cable corridor will be conducted during daylight hours and under normal circumstances no task lighting will be required. Some specific construction works will need to be performed continuously and may need to be carried out outside of daylight hours. For such occasions, suitable task lighting will be required.

6.4.3 Bats are known to utilise linear features which offer protection from predators, and shelter from the wind, making them important as both commuting and foraging routes through a landscape (Garland and Markham 2007). Research has indicated that bats will cross gaps in hedgerows or treelines (e.g. Verboom & Huitema 1997; Natural England 2012).

6.4.4 The lighting could deter bats from foraging or commuting around the periphery of the converter stations site. Many night flying insects are attracted to light and studies have found that certain species (including pipistrelles) swarm around white mercury street lights, whilst other species such as Daubenton's generally avoid it (Bat Conservation Trust 2009). It is also believed that artificial lighting can increase the chance of bats being preyed upon (Bat Conservation Trust 2009). The overall area requiring lighting is small and is on the edge of the already well lit Wilton Complex.

6.4.5 Overall, the effect of temporary hedgerow loss and night-time security is an effect of low magnitude.

6.4.6 The mitigation detailed in **Table 6.3** will be implemented in order to reduce construction impacts.

Table 6.3 Bats – mitigation measures

Mitigation measures
• The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint; • 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; • Following construction, the hedgerow will be reinstated as soon as possible. Hedgerows will be re-planted with regionally appropriate, species rich planting; • 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; and • 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 site and provide further opportunities for foraging bats.

6.4.7 Following the implementation of the mitigation above, the magnitude will reduce to negligible and the temporary loss of hedgerows and the lighting of the converter stations and site compounds are considered to have a **negligible** residual impact on bats.

Two projects – sequential

6.4.8 With either of the two project scenarios, twice the length of hedgerow would require removal to allow for cable crossings, i.e. approximately 600m. With the sequential scenario, with no time interval between the construction projects, the cable route installation could take up to 48 months and up to 72 months for works at the converter stations. This construction duration is for the installation

of the entire length of cable (approximately 9km for each project) and in reality, the disruption to a local bat population within an area of the cable corridor would be for a much shorter duration. The increased duration of the effect and increased loss of hedgerow increases the magnitude of the effect to medium.

6.4.9 Providing the mitigation in **Table 6.3** is implemented, the magnitude will decrease to low and overall there is considered to be a **minor adverse** residual impact on bats.

Wintering birds

Single project

6.4.10 The wintering birds fauna utilising the agricultural fields on the coast and immediately inland in the vicinity of the landfall, represent the most important aspect of the ecology within the study area. The agricultural fields close to the landfall are a popular local bird watching area (Britton and Day 2004) and the foreshore along the Redcar to Saltburn Coast LWS was included within the LWS designation on account of its wintering bird's fauna.

6.4.11 Based on the comprehensive desk study received from Teesmouth Bird Club (Peak Ecology 2013g) and the findings of the wintering birds studies carried out over the winter of 2011 – 2012 and autumn and winter of 2012 - 2013, as well as additional studies undertaken for golden plover and lapwing in 2014, this fauna has been evaluated as of Regional importance.

6.4.12 Farmland is by definition a constantly disturbed habitat and the birds are habituated to a changing environment and large agricultural machinery. The area of foreshore is also recognised as being popular with surfers (Marine Conservation Society 2013) and dog walkers. There is also the busy Coast Road (A1085), within close proximity of the coastal fields and therefore birds within this area are subject to a certain degree of disturbance from these activities.

6.4.13 It is likely that a series of habitat areas are utilised by the wintering birds, with year to year variation in use depending on the weather, agricultural use food availability and other such factors. A network of protected sites in the Teesside area has been established in order to provide habitat for foraging and roosting birds and therefore, there are a number of alternative fields available. Seven SSSIs are included within the Teesmouth and Cleveland Coast SPA which totals over 12.4km^2 in extent.

6.4.14 The coastal fields are essentially 70ha of arable fields of low ecological value in a strategic location between the North York Moors to the south (where the birds are likely to breed) and a series of valuable protected bird sites to the immediate north.

6.4.15 As suggested, it is highly likely that there is year on year variation in field use. For example, one year the fields might be freshly ploughed the next left as stubble, the year after that sown with winter wheat. The fields are also known to be subject to periodic flooding (Peak Ecology 2013a). Overall, an assemblage of birds would not be able to rely on them being available in a particular

condition each and every year and it is considered that they play a supporting role with regard to the wintering birds of Teesside, as opposed to a critical one.

6.4.16 As described in Section 6.2, the works at the landfall will comprise an HDD under the coastal grassland and low cliffs, together with the Coast Road. It is anticipated the HDD will begin at sea, however if that is not a viable option, open trenching and cofferdams will be required within the beach area. Either way, a joint transition bay (48m^2 in extent) within the HDD compound (2,500m^2) will be required, inland from the mean high water mark. The onshore cable will run through the fields from the joint transition bay to a second HDD located in the south west corner of the fields. There would also be a minor HDD compound (1,200m^2) and small site construction compound (784m^2) in the far south west corner of the fields, near to the Redcar Road and railway. The length of cable through this section of fields is approximately 980m and 18m wide (1.8ha) for each project.

6.4.17 All of the impacts associated with the scheme in this area would be temporary in nature. Given that the birds are using actively farmed fields (and in close proximity to a busy road), it seems reasonable to assume they would be resistant to a degree of disturbance by agricultural machinery, and nearby road traffic. Thus, the birds may continue to use the fields during the construction period, although perhaps in reduced numbers or for a reduced period of time.

6.4.18 There have been various studies on anthropogenic disturbance on wintering wading birds on coastal sites, although most of these relate to the mudflats and shorelines (e.g. Goss–Custard & Verboven 1993 and Burton *et al.* 2002). Some of these studies have looked at different types of disturbance, from walking, dog walking, water sports, aircraft noise, military shooting ranges etc. including calculated disturbance - flight distances of different species of waders and waterfowl to the various types of activities. For example, Tensen and Van Zooest (1983) (in Smit & Visser 1993), state that golden plover were “fairly tolerant” of walking disturbance compared with for example, redshank and curlew with a ‘take-flight’ mean distance of approximately 45m. A study in North Kent by Liley & Fearnley (2011), gave a no reaction response distance of 137.5m (range 50-190m) for golden plover and 100m (range 20-175m) for lapwing; this was averaged over all the types of disturbance encountered.

6.4.19 It is also noted that, between the last survey visit in December 2012, and the first visit in January 2013, development relating to the sewage treatment works to the south of Redcar to Marske Coastal Fields resulted in low level disturbance to birds to the northern part of the fields, whilst an open trench was dug to lay a pipeline from the sewage treatment works to the coast. Works in this area continued throughout the remaining survey visits. This observation showed to have little effect on the number of golden plovers or lapwings, however other birds such as feral pigeon and gull species reduced in number slightly.

6.4.20 The total working area for all activities within the fields is approximately 2ha. This equates to approximately 3% of the field being directly affected by the works. The remaining 97% of the field does not fall within the footprint of the works. There would be other potential impacts outside the working area

including visual and noise disturbance from the construction machinery and personnel. Disturbance may reduce the feeding efficiency of a species and either displace them into other feeding areas or decrease their food intake rates. The impacts of disturbance effects during construction are also likely to be influenced by the presence of locally available alternative feeding and roosting areas (Environment Agency 2006).

6.4.21 Given the disturbance distances found in the studies cited above and the proposed cable route running through the southern extent of the coastal fields, utilising the median figures of the Liley & Fearnley's (2011) results, approximately 34.4ha of habitat would be unsuitable for either species, leaving approximately 53% of the field area to the north of the route still available to golden plover and lapwing during the construction period.

6.4.22 The disturbance effects will remain throughout the construction period which will be two weeks for cable installation, two months for the HDD works and 24 weeks for works within the landfall envelope. Therefore, for up to two weeks, approximately 47% of the field will remain unavailable to wintering birds. For up to 22 weeks, the foreshore area around the landfall and the coastal fields in the vicinity of the joint transition bay will remain unavailable along with the HDD area close to the railway line, however this working footprint is far less associated with these works only, with the majority of the field being unaffected.

6.4.23 Overall, the small area of habitat that will be unavailable during the construction period and the additional disturbance effects are considered to be an effect of low magnitude.

6.4.24 The measures outlined in **Table 6.4** will reduce construction impacts on wintering birds in the coastal fields and within the foreshore of the LWS.

6.4.25 Overall, the area of coastal grassland and foreshore within the LWS are of Regional value for wintering birds. The coastal fields do not fall within the boundary of any statutory designated sites. The works will be temporary in nature and there is alternative habitat along the coast, relatively close to the scheme. With the implementation of the mitigation outlined in **Table 6.4**, the magnitude will reduce to negligible and a **negligible** residual impact is anticipated on wintering birds.

Two projects - sequential

6.4.26 The worst case scenario for wintering birds would be the sequential construction of Dogger Bank Teesside A & B, especially with no time interval between the construction projects and disturbance across consecutive winters. This would equate to 6% of the arable fields being directly affected by the works, leaving 94% of the fields available for wintering birds. The duration of works at the landfall is anticipated to be 24 weeks for each project, so with no gap between works, up to 48 weeks. The cable installation period within the coastal fields will be up to one month for the sequential build scenario. The HDD works remain the same duration of up to two months. Therefore, whilst the area around the landfall will not be available for up to 48 weeks, the works and reinstatement within the majority of the remainder of the field will be completed within one

month. The additional duration of effects is considered to increase the magnitude of effect to medium.

6.4.27 A combination of mitigation measures, as outlined in **Table 6.4** will be implemented to reduce all construction impacts. The additional duration of disturbance at the landfall would increase the magnitude of the effect to low and a **minor adverse** effect is anticipated on wintering birds.

Table 6.4 Wintering birds – mitigation measures

Mitigation measures
• 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: o Clear fencing of the working area and restriction of personnel movements outside the working area; o Installation of hoarding along the edge of the working area to reduce visual disturbance; o Strict adherence to all mitigation measures outlined in **Chapter 29 Noise and Vibration**; o Noise levels will be kept to a minimum and wherever possible silenced equipment and sound mufflers will be used; o Following construction, reinstatement of all land within the working footprint; and o Supervision of key stages of the works by an Ecological Clerk of Works (ECW).

Breeding birds

Single project

6.4.28 Following the survey work carried out in 2012, the breeding bird fauna proved to be relatively species rich and contained a number of Red and Amber listed BoCC. Given the landscape setting within which these transects are located, i.e. primarily industrial and intensive agricultural land, this breeding bird fauna is considered to be of County value.

6.4.29 At the converter stations site, there would be permanent loss of up to 4ha of arable land. However the habitat within the converter stations site is not considered to be of value to breeding birds since it is located within a featureless arable field on the edge of the Wilton Complex, and no notable birds were identified during surveys.

6.4.30 The installation of the cable systems will require 15 hedgerow crossings to allow the trenching installation work to progress. If the hedgerow removals were undertaken within the bird nesting season, this could potentially lead to the loss of nest, eggs and chicks. Overall, a total of 300m of hedgerow will require removal prior to works being undertaken. A total of 22.3km of hedgerow was recorded within the study area.

6.4.31 The construction works could lead to disturbance from noise and visually from the presence of machinery and personnel which could deter birds from nesting close to the working area. The works within the converter stations site are anticipated to take up to 36 months in duration, with the cable installation taking up to 24 months to complete across the project.

6.4.32 The overall magnitude of the construction effects is considered to be low.

6.4.33 The mitigation detailed in **Table 6.5** will be implemented in order to reduce the overall construction impacts on breeding birds.

Table 6.5 Breeding birds – mitigation measures

Mitigation measures
• The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint; • 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 this species; • Ensure construction plant and traffic activity is kept to designated access road to avoid disturbance to ground nesting birds; • Following construction, reinstatement to its former condition of all habitats including hedgerow re-planting with regionally appropriate, species rich planting; and • 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 site and provide further opportunities for breeding birds.

6.4.34 With the implementation of the mitigation outlined in **Table 6.5**, the temporary nature of works and the long-term habitat reinstatement works, the magnitude will reduce to negligible and the overall residual impact on breeding birds is considered to be **negligible**.

Two Projects – sequential

6.4.35 With either of the two project scenarios, twice the length of hedgerow would require removal to allow for cable crossings, i.e. 600m. With the sequential scenario, with no time interval between the construction projects, the cable route installation could take up to 48 months and up to 72 months for works at the converter stations. The installation of the cable will be in sections and therefore disturbance will be restricted to the birds within the locality of the working area at the time, rather than along the entire cable route corridor.

6.4.36 Providing the mitigation in **Table 6.5** is implemented, the doubling in extent of temporary hedgerow loss and additional duration of disturbance is considered to be a low magnitude effect and a **minor adverse** residual impact.

Table 6.6 Summary of construction impacts and associated mitigation measures

Valued ecological receptor	Geographical scale of importance	Impacts in the absence of mitigation						Confidence in EcIA predictions*	Mitigation measures	Residual impacts**	Confidence in mitigation predictions***
		Impact	Construction scenario	Impact magnitude	Duration of impact	Reversibility	Timing and frequency				
Redcar to Saltburn Coast LWS	County	Habitat damage or loss	Single project	Low	Temporary	Reversible in up to 2 -3 years	N/A	Probable	Table 6.1	Negligible	Certain/ near-certain
			Two projects - concurrent	Low	Temporary	Reversible in up to 2 -3 years	N/A	Probable		Minor adverse	Certain/ near-certain
Hedgerow	County	Habitat loss and fragmentation	Single project	Low	Temporary	Reversible in 10 – 15 years	Impact less in winter	Certain/ near- certain	Table 6.2	Negligible/ Minor beneficial	Certain/ near-certain
			Two projects – concurrent or sequential	Low	Temporary	Reversible in 10 – 15 years	Impact less in winter	Certain/ near- certain		Minor adverse/ Minor beneficial	Certain/ near-certain
Wintering birds	Regional	Disturbance	Single Project	Low	Temporary	Reversible in up to 2 - 3 years	Impact only occurs in winter	Probable	Table 6.3	No impact/ Negligible	Probable
			Two projects – sequential	Medium	Temporary	Reversible in up to 4 - 5 years	Impact only occurs in winter	Probable		No impact/ Minor adverse	Probable
Breeding birds	County	Damage or destruction of bird's nests and disturbance	Single project	Low	Temporary	Reversible in 2-3 years	Reduced impact if breeding season avoided	Probable	Table 6.4	Negligible	Probable

Valued ecological receptor	Geographical scale of importance	Impacts in the absence of mitigation						Confidence in EcIA predictions*	Mitigation measures	Residual impacts**	Confidence in mitigation predictions***
		Impact	Construction scenario	Impact magnitude	Duration of impact	Reversibility	Timing and frequency				
			Two projects – sequential	Low	Temporary	Reversible in 4-5 years	Reduced impact if breeding season avoided	Probable		Minor Adverse	Probable
Bats	County	Habitat loss and fragmentation and disturbance	Single project	Low	Temporary	Reversible in 10 – 15 years	Impact less in winter	Probable	**Table 6.5**	Negligible	Probable
			Two projects – sequential	Medium	Temporary	Reversible in 10 – 15 years	Impact less in winter	Probable		Minor adverse	Probable

* Confidence that the evaluation and assessment of impact is correct given that certain parameters may be estimated (and difficult to estimate). Certain/near certain is ≥95%. Probable is 50 – 94%. Unlikely is 6 – 49%. Extremely unlikely is ≤5%.

** 'Residual impacts' are assessed on the assumption that the mitigation suggested is adopted and implemented fully. It is the residual impacts that are described in the text in Sections 5.2 and 5.3 above.

*** Confidence that the mitigation suggested will go ahead, be successful within the predicted timeframes and that the prediction of residual impacts is accurate. Confidence 'bands' as above.

6.5 Other receptors requiring mitigation during construction

6.5.1 Whilst the VER have been taken through the impact assessment process, mitigation for other species (otters and badgers) will be undertaken due to the legal protection afforded to the species and animal welfare considerations.

Badgers

6.5.2 Badgers are known to be present in the local area and the construction phase of works is not programmed to begin (earliest) until mid-2015. There is the potential for further setts to have been constructed within or close to the working area. The following mitigation measures are proposed in **Table 6.7**.

Table 6.7 Badger mitigation measures

Mitigation measures
• 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.

Otters

6.5.3 Otters are a protected by UK and European legislation (under the Conservation of Habitats and Species Regulations (2010) and Wildlife and Countryside Act (1981) as amended). They are also listed as UK BAP and LBAP priority species. No signs of otter were recorded during the surveys, however on a precautionary basis and for reasons of legal compliance; mitigation will be undertaken for the species (**Table 6.8**).

Table 6.8 Otter mitigation measures

Mitigation measures
• 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.

7 Assessment of Impacts During Operation

7.1 Introduction

7.1.1 This section identifies the potential effects upon terrestrial ecology receptors associated with the operation of Dogger Bank Teesside A & B.

7.2 Assessment of impacts

7.2.1 The majority of the ecological effects of the onshore electrical connections for Dogger Bank Teesside A & B will be associated with the construction phase of cable installation. The cable route will be buried below ground and therefore not affect any terrestrial ecology receptors. Only those receptors close to the converter stations site (bats) are considered to be potentially affected due to lighting.

7.2.2 No impacts are anticipated on any habitats of biodiversity value, breeding or wintering birds during the operational phase of Dogger Bank Teesside A & B.

Bats

All scenarios

7.2.3 The converter stations site will require operational low-level lighting and night-time motion sensitive security lighting which could disrupt foraging or commuting bats utilising the woodland band around the site. Assuming that sympathetic lighting is used (as outlined in **Table 6.3**), and once the landscape planting is established, the additional woodland will provide further foraging and in the long-term, potentially roosting opportunities. Overall, in the short-term, there would be a **negligible** impact on bats but in the long-term; **no impacts** on bats are anticipated during the operational phase of the Dogger Bank Teesside A & B.

8 Assessment of Impacts During Decommissioning

8.1 Assessment of impacts during decommissioning

8.1.1 In terms of decommissioning, it is understood that these would comprise:

- The majority of the buried cable system left *in situ*, although it may have to be removed from the landfall area;
- Dismantling and removal of above ground electrical equipment;
- Removal of any building services equipment;
- Demolition of the buildings and removal of security fences; and
- Landscaping and reinstatement of the site.

8.1.2 The decommissioning works would form part of an overall 'Decommissioning Plan', for which a full EIA will be carried out in advance of any decommissioning works taking place.

8.1.3 It is anticipated that whilst decommissioning the project would cause ecological impacts it is reasonable to suggest that these would always be no worse than those caused by construction. It is likely that protected species surveys of the converter stations site and other sensitive locations would be required to identify any new constraints to the works.

9 Inter-Relationships

9.1 Inter-relationships

9.1.1 In order to address the environmental impact of the proposed development as a whole, this section establishes the inter-relationships between terrestrial ecology and other physical, environmental and human receptors. The objective is to identify where the accumulation of impacts on a single receptor, and the relationship between those impacts, may give rise to a need for additional mitigation.

9.1.2 **Table 9.1** summarises the inter-relationships that are considered of relevance to terrestrial ecology and identifies where they have been considered within the ES.

Table 9.1 Inter-relationships relevant to the assessment of terrestrial ecology

Inter-relationship	Section where addressed	Linked chapter
All phases		
Influence of construction noise disturbance on protected species.	Section 6	**Chapter 29 Noise and Vibration**
Influence of surrounding landscape in relation to the greater context of habitats and supported species, landscaping mitigation measures.	Section 6	**Chapter 21 Landscape and Visual Impact Assessment**
Influence of dust upon Redcar to Saltburn LWS and production of a Dust Management Plan.	Section 6	**Chapter 30 Air Quality**
Influence of ground disturbance, handling of soil, loss of substrate and contaminated land upon habitats and species.	Section 6	**Chapter 24 Onshore Geology, Water Resources and Land Quality**

9.1.3 **Chapter 31 Inter-Relationships** provides an overview of all the inter-related impacts associated within the proposed development.

10 Cumulative Impact Assessment

10.1 Introduction

10.1.1 This section describes the cumulative impact assessment (CIA) for terrestrial ecology, taking into consideration other plans, projects and activities. A summary of the CIA is presented in **Chapter 33**.

10.2 Cumulative Impact Assessment strategy and screening

10.2.1 Forewind has developed a strategy for the assessment of cumulative impacts in consultation with statutory stakeholders including the Marine Management Organisation (MMO), the JNCC, Natural England and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Details of the approach to CIA adopted for this ES are provided in **Chapter 4 EIA Process**.

10.2.2 The strategy recognises that data and information sufficient to undertake an assessment will not be available for all potential projects, activities, plans and/or parameters, and seeks to establish the confidence in the data and other information that is available.

10.2.3 The CIA onshore involves consideration of whether impacts on a receptor can occur on a cumulative basis between the onshore elements of Dogger Bank Teesside A & B and other activities, projects and plans for which sufficient information regarding location and scale exist.

10.2.4 The onshore projects, activities and plans relevant to terrestrial ecology are presented in **Table 10.1** along with the screening exercise to identify whether there is sufficient confidence in the project details to take these forward to the assessment.

Table 10.1 Cumulative impact assessment screening for terrestrial ecology

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Rationale for where no cumulative impacts are expected
Commercial plant	Tees Renewable Energy Plant	Expected Operational in 2015	Present - 2015	>2km	High	High	Outside onshore study area
Offshore wind farm cable	Tees Renewable Energy Plant underground cable	In construction	Present – 2015	0m	High	High	N/A – carried forward to CIA
Pipeline	York Potash Project	In planning	No indication	0m	Medium	Medium	N/A – carried forward to CIA
Anemometry Mast	Anemometry Mast at The Wilton Centre	Planning permission granted in 2011. Construction to be completed within 3 years	Construction must begin between 2011 - 2014	10m	High	High	Small scale project, no cumulative impacts anticipated.
Terminal	Northern Gateway Terminal	Outline permission given in 2007. October 2012 decision: Grant Reserved Matters	No indication	>2km	Medium - High	Medium - High	Outside onshore study area

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Rationale for where no cumulative impacts are expected
Pipeline	Breagh Pipeline	Planning permission granted, April 2012, development must begin within 3 years.	Present - 2015	>2km	High	High	Outside onshore study area
Erection of residential buildings	Two storey 2, 3 and 4 bedroom dwelling houses and garages	Public consultation ends March 2013	No indication	>2km	Medium - High	Medium - High	Outside onshore study area
Single pole installation	Installation of single pole to house transformer unit (application submitted under section 37 of the electricity act 1989)	Public consultation end February 2013	Construction must begin within 2013 – 2016	>3km	Medium - High	Medium - High	Outside onshore study area
Redevelopment of residential buildings	Redevelopment comprising the erection of 288 dwellings and ancillary works (amended scheme)	Granted planning permission	Construction must begin within 2013 – 2016	1.9km	High	High	Outside onshore study area

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Rationale for where no cumulative impacts are expected
Demolition	Demolition of various buildings	Granted deemed consent February 2013	Destruction must begin within 2013 – 2016	<500m	Medium - High	Medium - High	Within study area however separated by the A174 so no cumulative impacts anticipated.
Erection of residential buildings	Erection of 6 dwellings	Granted planning permission	Construction must begin within 2013 – 2016	<1km	High	High	Within study area however in Redcar town and so no cumulative impacts on terrestrial ecology are anticipated.
Power station	Teesside Power Station	Permission not required December 2012	No indication	<500m	Medium	Medium	N/A – carried forward to CIA
Erection of residential buildings	Three storey 72 bedroom care home	Granted planning permission March 2013	Construction must begin within 2013 – 2016	>3km	High	High	Outside onshore study area
Commercial plant	Screening opinion request for new biomass import facility	EIA not required, Nov 2012	No indication	>2km	Low - Medium	Low - Medium	Outside onshore study area
Commercial plant	Screening opinion for proposed potash processing plant	Insufficient info in planning application, November 2012	No indication	1.9km	Low - Medium	Low - Medium	Outside onshore study area

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Rationale for where no cumulative impacts are expected
Erection of commercial buildings	Two storey management block with associated 92 space car park	Planning permission granted December 2012. Development must begin within 3 years.	2012 – 2015	595m	High	High	Located in highly industrial area, no receptors identified.
Offshore wind farm onshore electrical connection	Dogger Bank Teesside C & D	Application expected in 2015	2016	0m	High	High	N/A – carried forward to CIA
Onshore renewables	Scoping request for two wind turbines	Scoping Opinion requested	Five month construction period but unknown date	0m	High	High	N/A – carried forward to cumulative impact assessment
Onshore renewables	One wind turbine	Withdrawn	Unknown	130m	High	High	Not carried forward to cumulative impact assessment
Waste Treatment facility	Teesport Waste Treatment Facility	Planning permission granted 11 December 2013	Construction must begin between 2013-2016	>3km	High	High	Outside onshore study area
Commercial plant	Elring Klinger (GB) Ltd Extension to factory	Planning permission granted 22 October 2013. Development to	Construction must begin between 2013-2016	670m	High	High	Application site is separated from study area by roads and therefore no cumulative

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Rationale for where no cumulative impacts are expected
		begin within 3 years of permission					impacts are anticipated.
Demolition of a Power station	Teesside Power Plant	Permission not required (decision made on 26 June 2013)	From approximately 2nd October 2013 to 30th September 2014	200m	Low	Low	N/A – carried forward to CIA
Power Plant	Earthly Energy Group: Anaerobic power plant	Planning permission granted 24 July 2013. Development to begin within 3 years of permission	Construction must begin between 2013-2016	>2km	High	High	Outside onshore study area
Onshore renewables	Erection of single wind turbine, maximum height 80m (Elring Klinger)	Planning permission granted 6 Jun 2013. Development to begin within 3 years of permission.	Construction must begin between 2013-2016	590m	High	High	N/A – carried forward to CIA

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Rationale for where no cumulative impacts are expected
Waste water	Northumbrian Water: Effluent main pipe	Planning permission granted 29 Aug 2013. Development to begin within 3 years of permission.	Construction must begin between 2013-2016	>2km	High	High	Outside onshore study area
Onshore renewables	Bankfield Wind Farm	Public consultation ends 30 Nov 2013	Unknown	>2km	High	High	Outside onshore study area
Onshore renewables	Land at Court Green Farm: Single wind turbine	Public consultation end date 2 Sept 2013	Unknown	>2km	High	Medium-High	Outside onshore study area
Residential	Change to house type: Substitution of 30 approved house types of planning permission with 28 new house types, boundary treatments and associated landscaping	Planning permission granted 2 August 2013	Construction must begin between 2013-2016	>2km	High	Medium-High	Outside onshore study area

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Rationale for where no cumulative impacts are expected
Residential	Four bungalows: Yew Tree Care Centre	Planning permission granted 1 Jul 2013. Development to begin within 3 years of permission	Construction must begin between 2013-2016	1.4km	High	High	Outside onshore study area
Residential	1000 Dwelling development	Public consultation end date 26 Nov 2013	Unknown	1.4km	High	High	Outside onshore study area
Agricultural	Erection of agricultural building	Planning permission granted 5 July 2013	Construction must begin between 2013 – 2016	0m	High	Medium	Small scale project, no cumulative impacts anticipated
Residential development	Development of 14 two storey detached dwellings	Planning permission granted 4 Nov 2013. Development to begin within 3 years of permission	Construction must begin between 2013-2016	1.1km	High	Medium	Outside onshore study area

10.3 Cumulative Impact Assessment

Tees Renewable Energy Plant Underground Cable (TREPUC)

10.3.1 This project consists of a 400kv cable for connection of the Tees Renewable Energy Plant and the existing NGET substation at Lackenby and runs from Tees Dock down western edge of Wilton Complex to Lackenby substation.

10.3.2 The project is considered to have potential cumulative impacts upon the following receptors: hedgerows, breeding birds and bats. The potential impacts and additional, further mitigation measures are outlined below.

Hedgerows – temporary loss of hedgerows

10.3.3 Where the TREPUC runs down the western side of the Wilton Complex it enters the far western end of the Dogger Bank Teesside A & B study area. This would result in a minor increase in hedgerow loss.

10.3.4 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.2**. Post-mitigation impacts of a single project are **negligible** and of two projects built concurrently or sequentially, **minor adverse**. In the longer term, replacing species poor hedgerows with species rich planting will lead to minor beneficial impacts under both scenarios. Assuming TREPUC adopt similar mitigation to that shown in **Table 6.2**, no additional mitigation would be required and overall no additional cumulative impact is anticipated.

Breeding birds – damage or destruction of birds' nests and disturbance

10.3.5 Where the TREPUC runs down the western side of the Wilton Complex it enters the far western end of the Dogger Bank Teesside A & B study area. This would result in a minor increase in hedgerow loss and construction disturbance in an area of apparently lower value for breeding birds.

10.3.6 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.5**. Post-mitigation impacts of single project are **negligible** and of two projects built sequentially, **minor adverse**.

10.3.7 It can be assumed that TREPUC will adopt similar mitigation measures to Dogger Bank Teesside A & B (**Table 6.5**), due to the legal protection afforded to nesting birds. Therefore, no additional mitigation would be required and overall, no additional cumulative impact is predicted.

Bats – habitat loss and fragmentation and disturbance

10.3.8 Where the TREPUC runs down the western side of the Wilton Complex it enters the far western end of the Dogger Bank Teesside A & B study area. This would result in a minor increase in hedgerow loss, and construction disturbance in an area of apparently lower value for bats.

10.3.9 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.3**. Post-mitigation impacts of single project are **negligible** and of two projects built sequentially, **minor adverse**.

10.3.10 The mitigation measures proposed (**Table 6.3**) are to ensure the project follows best practice guidelines and that the project is legally compliant. Assuming that TREPUC will take similar steps, then no additional mitigation would be required and overall no additional cumulative impact is anticipated.

York Potash Project

10.3.11 York Potash Project will be located down the eastern edge of Wilton Complex, then south east, and will cross the Dogger Bank Teesside A & B cable route to the east of Wilton Complex.

10.3.12 The pipeline consists of two 625mm bore steel pipes to transport potash ore 45km from new potash mine south of Whitby to new processing plant on Teesside. A working width of 45m will be required for installation.

10.3.13 Further information on the construction schedule for the pipeline is not available at the time of writing. An assumption can be made that typically, it takes between 12-18 months following submission for consent to be granted. Therefore, there is the potential for the construction phase to overlap with Dogger Bank Teesside A & B.

10.3.14 The only potential receptors initially identified as potentially being cumulatively effected are hedgerows, breeding birds and bats.

Hedgerows - temporary loss of hedgerows

10.3.15 Where the York Potash Project crosses the Dogger Bank Teesside A & B study area, there would potentially be a significant increase in the degree of hedgerow loss.

10.3.16 Key mitigation for Dogger Bank Teesside A & B is hedgerow re-planting (**Table 6.2**). In the short term, post-mitigation impacts of single project are negligible and of two projects built concurrently or sequentially, minor adverse. In the longer term, replacing species poor hedgerows with species each planting will lead to minor beneficial impacts under both scenarios. It is assumed that York Potash Project would follow best practice guidelines and adopt similar mitigation to **Table 6.2**. Therefore no additional mitigation would be required, and overall no additional cumulative impact is anticipated.

Breeding birds – damage or destruction of birds' nests and disturbance

10.3.17 Where the York Potash Project crosses the Dogger Bank Teesside A & B study area, there would potentially be a significant increase in the degree of hedgerow loss and construction disturbance.

10.3.18 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.5**. Post-mitigation impacts of single project are **negligible** and of two projects built sequentially, **minor adverse**.

10.3.19 It can be assumed that the York Potash Project will adopt similar mitigation measures to Dogger Bank Teesside A & B (**Table 6.5**), due to the legal protection afforded to nesting birds. Therefore no additional mitigation would be required, and overall no additional cumulative impact is anticipated.

Bats – habitat loss and fragmentation and disturbance

10.3.20 Where the York Potash Project crosses the Dogger Bank Teesside A & B study area, there would potentially be a significant increase in the degree of hedgerow loss and construction disturbance which could impact on foraging and commuting bats.

10.3.21 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.3**. Post-mitigation impacts of single project are **negligible** and of two projects built sequentially, **minor adverse**.

10.3.22 The mitigation measures proposed (**Table 6.3**) are to ensure the project follows best practice guidelines and that the project is legally compliant. Assuming that the York Potash Project will take similar steps, then no additional mitigation would be required and overall no additional cumulative impact is anticipated.

Dogger Bank Teesside C & D

10.3.23 This project is the third and fourth projects of the second stage of the Dogger Bank development. Dogger Bank Teesside C & D will comprise two wind farms, each with a generating capacity of up to 1.2GW, which is expected to connect into the National Grid just south of the Tees Estuary.

10.3.24 The landfall and HVDC are broadly in parallel with Dogger Bank Teesside A & B as far as the C & D converter stations in the south eastern corner of the Wilton Complex. Here, the HVAC may head north towards National Grid substation at Tod Point.

10.3.25 The potential receptors of the project are considered to be the same as those identified within this chapter. The anticipated effects from the Dogger Bank Teesside C & D are effects to the Redcar and Saltburn LWS, hedgerows, wintering birds, breeding birds, and bats.

10.3.26 As a worst case scenario, should Dogger Bank Teesside A & B and Dogger Bank Teesside C & D all be constructed at the same time, it would result in an increase in magnitude of impacts already identified. Mitigation for receptors identified would be similar as for Dogger Bank Teesside A & B, e.g. consultation, undertaking construction works outside of sensitive times, minimisation of working areas, and reinstatement of features on completion of the works. In addition, it may be possible to phase the construction works wherever possible to reduce the impacts. Overall, whilst the implementation of mitigation will reduce the impact on terrestrial ecological receptors, a cumulative impact is likely to remain on receptors.

Redcar to Saltburn Coast LWS – habitat damage or loss

10.3.27 Two landfalls would be required within the LWS, essentially doubling the level of impact.

10.3.28 Mitigation for Dogger Bank Teesside A & B is given in **Table 6.1**. Although all four projects together would result in a doubling of the level of impact, assuming similar mitigation for Dogger Bank Teesside C & D, there should be no requirement for further mitigation and **no** additional cumulative impact.

Hedgerows - temporary loss of hedgerows

10.3.29 The temporary loss of hedgerows will represent a loss of habitat for numerous species, and in particular may cause impacts upon breeding birds and bats within the Dogger Bank Teesside A & B study area; there would potentially be a significant increase in the degree of hedgerow loss.

10.3.30 Key mitigation for Dogger Bank Teesside A & B is hedgerow re-planting (**Table 6.2**). In the short term, post-mitigation impacts of single project are negligible and of two projects built concurrently, minor adverse. In the longer term, replacing species poor hedgerows with species each planting will lead to **minor beneficial** impacts under both scenarios. Assuming similar mitigation to **Table 6.2**, is implemented for Dogger Bank Teesside C & D, no additional mitigation would be required and therefore **no** additional cumulative impact.

Wintering birds

10.3.31 The key area for both Dogger Bank Teesside A & B and Dogger Bank Teesside C & D is the arable fields near the landfall. Primarily, the level of impact would be doubled by having four projects compared with two. Cumulative impacts are predicted depending on timings and project specifics. It is understood that it is unlikely that all four projects will be built concurrently, and that sequential build scenarios are more likely.

10.3.32 **Table 6.4** shows mitigation for wintering birds for Dogger Bank Teesside A & B. As a minimum, similar mitigation will be required for Dogger Bank Teesside C & D. For either Dogger Bank Teesside A & B or Dogger Bank Teesside C & D on its own, this would result in **minor adverse** post-mitigation impacts. However this relies on the possibility of displacing wintering birds to other parts of the arable field. With both Dogger Bank Teesside A & B and Dogger Bank Teesside C & D being built at either end of the field, there is the potential for an increased magnitude of effect. Thus additional mitigation will be required.

10.3.33 A construction coordination plan for the projects will be required, to include detailed consideration of how best to minimise impacts on wintering birds. As a preliminary illustrative example, works on Dogger Bank Teesside A & B might take place in September and October, November and December might be avoided, and works on Dogger Bank Teesside C & D take place in January and February.

10.3.34 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.4**. Impacts of single project are **negligible** and of two projects built sequentially, **minor adverse**.

Bats – habitat loss and fragmentation and disturbance

10.3.35 Along the HVDC routes, the combined projects (Dogger Bank Teesside A & B and Dogger Bank Teesside C & D), would result in a significant increase in the degree of hedgerow loss and construction disturbance, as the working width would be doubled, resulting in hedgerow gaps of 72m (four projects) instead of 36m (two projects).

10.3.36 Additional mitigation would be required in the form of introducing semi-mature, plant grown shrubs in small clusters, within the hedgerow re-planting. This would reduce the functional length of gaps more quickly, and maintain the overall level of impact as **minor adverse**.

Teesside Power Station

10.3.37 This project includes the demolition of eight off heat recovery system generator exhaust stacks and is located off the A1053, Greystone Road. Planning permission is not required for this project and the following comment was made on the planning application :

"The exhaust stacks to be demolished are located within a predominately industrial area. It is not considered the demolition of the exhaust stacks and retention of the other equipment on the site will have not a significantly detrimental effect on the surrounding area. The proposed method of demolition and restoration of the site is considered to be acceptable. Prior Approval of the Local Planning Authority is not therefore required".

10.3.38 It is therefore not considered likely that the works will have a cumulative impact on any of the receptors identified within this chapter.

Scoping request for two wind turbines

10.3.39 This project involves the installation of two wind turbines within land 680m west of Yearby and 650m north of Wilton.

10.3.40 At this stage, very little project information concerning the construction programme or timing has been made available. Therefore an assumption has been made that the construction programme will overlap with Dogger Bank Teesside A & B.

10.3.41 The only potential receptors initially identified as potentially being cumulatively effected are hedgerows, breeding birds and bats.

Hedgerows - temporary loss of hedgerows

10.3.42 The scoping envelope overlaps with the cable corridor and on a worst case scenario, assuming this stretch of hedgerow requires removal, it would result in a minor increase in the length of hedgerow lost.

10.3.43 Key mitigation for Dogger Bank Teesside A & B is hedgerow re-planting (**Table 6.2**). In the short term, post-mitigation impacts of single project are **negligible** and of two projects built concurrently or sequentially, **minor adverse**. In the longer term, replacing species poor hedgerows with species each planting will lead to **minor beneficial** impacts under both scenarios. It is assumed that this project would follow best practice guidelines and adopt similar mitigation to **Table 6.2**. Therefore no additional mitigation would be required, and overall no additional cumulative impact is anticipated.

Breeding birds – damage or destruction of birds' nests and disturbance

10.3.44 Where the scoping envelope crosses the Dogger Bank Teesside A & B study area, there would potentially be a significant increase in the degree of hedgerow loss and construction disturbance to nesting birds.

10.3.45 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.5**. Post-mitigation impacts of single project are **negligible** and of two projects built sequentially, **minor adverse**.

10.3.46 It can be assumed that this project will adopt similar mitigation measures to Dogger Bank Teesside A & B (**Table 6.5**), due to the legal protection afforded to nesting birds. Therefore no additional mitigation would be required, and overall no additional cumulative impact is anticipated.

Bats – habitat loss, fragmentation, disturbance and collision risk

10.3.47 Within the area close to where the scoping envelope crosses the cable corridor, bats could suffer from foraging and commuting habitat loss, and potentially collision risk with the turbines.

10.3.48 Mitigation for Dogger Bank Teesside A & B is shown in **Table 6.3**. Post-mitigation impacts of single project are **negligible** and of two projects built sequentially, **minor adverse**.

10.3.49 The mitigation measures proposed (**Table 6.3**) are to ensure the project follows best practice guidelines and that the project is legally compliant. Therefore, assuming that the project adopts similar mitigation measures and best practice guidelines are followed in relation to siting turbines in proximity to hedgerows, then no additional mitigation would be required and overall no additional cumulative impact is anticipated.

Installation of a single turbine (Cirrus Energy)

10.3.50 A single wind turbine is proposed on land approximately 600m south of Turners Arms Farm. A transformer/substation compound including new vehicle access roads would also be required. The construction programme for the project is not currently known and therefore it has been assumed that the construction programme will overlap with Dogger Bank Teesside A & B.

10.3.51 The scoping envelope falls outside the cable corridor, but within the wider study area and therefore the only potential receptor initially identified as potentially being cumulatively effected are bats.

Bats – habitat loss, fragmentation, disturbance and collision risk

10.3.52 Bats within the study area may suffer from a loss of foraging habitat, disturbance from the works and potentially collision with turbines.

10.3.53 The mitigation measures proposed (**Table 6.3**) are to ensure the project follows best practice guidelines and that the project is legally compliant. Therefore, assuming that the project adopts similar mitigation measures and best practice guidelines are followed in relation to siting turbines in proximity to hedgerows, then no additional mitigation would be required and overall no additional cumulative impact is anticipated.

Teesside Power Station: demolition of a power station

10.3.54 At Teesside Power Station, it is proposed for the demolition of the power station and the associated structures and equipment. Planning permission is not

required for the scheme and the following comment was made on the planning application website:

"The power station and other associated structures to be demolished are located within a predominately industrial area. It is not considered the demolition will have a significantly detrimental effect on the surrounding area. The proposed method of demolition and restoration of the site is considered to be acceptable. Prior Approval of the Local Planning Authority is not therefore required."

10.3.55 It is therefore not considered likely that the works will have a cumulative impact on any of the receptors identified within this chapter.

Elring Klinger: Erection of a single wind turbine

10.3.56 Elring Klinger propose to install a single wind turbine (maximum height: 80m) and the associated infrastructure including access tracks, hardstanding, control buildings and cabling. The site is located on land to the west of Kirkleatham Business Park.

10.3.57 The project is at the scoping stage and the scoping envelope falls outside the cable corridor, but within the wider study area and therefore the only potential receptor initially identified as potentially being cumulatively effected are bats.

Bats – habitat loss, fragmentation, disturbance and collision risk

10.3.58 Bats within the study area may suffer from a loss of foraging habitat, disturbance from the works and potentially collision with turbines.

10.3.59 The mitigation measures proposed (**Table 6.3**) are to ensure the project follows best practice guidelines and that the project is legally compliant. Therefore, assuming that the project adopts similar mitigation measures and best practice guidelines are followed in relation to siting turbines in proximity to hedgerows, then no additional mitigation would be required and overall no additional cumulative impact is anticipated.

11 Transboundary Effects

11.1 Transboundary effects

11.1.1 No transboundary effects have been identified in relation to terrestrial ecology.

12 Summary

12.1 Summary

12.1.1 This chapter of the ES has assessed the potential impact of Dogger Bank Teesside A & B on the baseline terrestrial ecology environment in the identified study areas.

12.1.2 It has provided a characterisation of the existing environment for terrestrial ecology based on existing data, which has established that, using the worst-case scenarios, there are minor adverse residual impacts to: Redcar and Saltburn LWS, hedgerows, wintering birds, breeding birds, and bats during construction and negligible impacts to bats during operation.

12.1.3 These impacts are minimised as far as possible through embedded mitigation, including the avoidance of all statutory designated sites, woodlands and ponds. Mature trees have also been avoided, and throughout the iterative process, minor adjustments to the cable route have been made for reasons of safeguarding ecological features.

12.1.4 Key additional mitigation includes maintaining a strict construction footprint, adhering to standard construction practices and pollution prevention guidance, undertaking construction outside sensitive times (such as breeding periods) where possible, reinstating features to their baseline condition or better. An ECW will also be used to provide toolbox talks and oversee key construction activities.

12.1.5 **Table 12.1** provides a summary of the potential impacts on terrestrial ecology arising from the realistic worst case scenarios set out in Section 5 of the chapter.

Table 12.1 Summary of predicted impacts of Dogger Bank Teesside A & B on terrestrial ecology

Description of impact	Key mitigation measures	Residual impact (worst case scenario)
Construction phase		
Redcar to Saltburn Coast LWS	• 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; • No storage of materials or machinery will be permitted outside the working width and within the boundary of the LWS; • An 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; • 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'; and • Reinstatement of habitats affected by the works to their former condition following construction.	**Minor adverse**
Hedgerow	• The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint; • 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. 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; and • Following construction, the hedgerow will be reinstated as soon as possible. Hedgerows will be re-planted with regionally appropriate, species rich planting.	**Minor adverse (short-term)/ Minor beneficial (long-term)**
Wintering birds	• 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: o Clear fencing of the working area and restriction of personnel movements outside the working area; o Installation of hoarding along the edge of the working area to reduce visual disturbance; o Strict adherence to all mitigation measures outlined in **Chapter 29 Noise and Vibration**; o Noise levels will be kept to a minimum and wherever possible silenced equipment and sound mufflers will be used; o 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).	**Negligible (single project) Minor adverse (two projects)**

Description of impact	Key mitigation measures	Residual impact (worst case scenario)
Breeding birds	• The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint; • 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 this species; • Ensure construction plant and traffic activity is kept to designated access road to avoid disturbance to ground nesting birds; • Following construction, reinstatement to its former condition of all habitats including hedgerow re-planting with regionally appropriate, species rich planting; and • 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 site and provide further opportunities for breeding birds.	**Minor adverse**
Bats	• The working areas will be clearly marked out on site to prevent any unnecessary damage or disturbance to land outside the development footprint; • 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; • Following construction, the hedgerow will be reinstated as soon as possible. Hedgerows will be re-planted with regionally appropriate, species rich planting; • 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; and • 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 site and provide further opportunities for foraging bats.	**Minor adverse**

Description of impact	Key mitigation measures	Residual impact (worst case scenario)
Operational Phase		
Bats	• Establish sympathetic lighting (as outlined in **Table 6.5**); and • Maintain landscape planting.	**Negligible**
Decommissioning Phase		
As per construction phase	• As per construction phase.	**As per construction phase**

13 References

Bat Conservation Trust, 2009. Bats and Lighting in the UK: Bats and the Built Environment Series. Available online: http://www.bats.org.uk/pages/bats_and_lighting.html. Downloaded on 12/06/13.

Britton, D. and Day, J. (2004). Where to Watch Birds in the North East of England. Helm Series, Bloomsbury Publishing, London.

Burton N.H.K., Rehfisch M.M & Clark N.A. (2002). Impacts of disturbance from construction work on the densities and feeding behaviour of waterbirds using the intertidal mudflats of Cardiff Bay, UK, Environmental Management, 6: 865-71.

Department for Energy and Climate Change (2011a). Overarching National Policy Statement for Energy EN-1. The Stationery Office, London.

Department for Energy and Climate Change (2011b). National Policy Statement for Renewable Energy Infrastructure EN-3. The Stationery Office, London.

Department for Energy and Climate Change (2011c). National Policy Statement for Electricity Network Infrastructure EN-5. The Stationery Office, London.

Eaton M.A., Brown A.F., Noble D.G., Musgrove A.J., Hearn R.D., Aebischer N.J., Gibbons D.W., Evans A. & Gregory R.D. (2009). Birds of Conservation Concern 3. The population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds, 102: 296 – 341.

English Nature (2001). The Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

Environment Agency (2006). Humber Estuary Flood Defence Strategy, Paull Holme Strays. Environmental Monitoring Report, Version No. 1.0 January 2006.

Garland L. and Markham S. 2007. Is important bat foraging and commuting habitat legally protected? Bat Conservation Trust, Online. Available at: http://www.bats.org.uk/publications_download.php/351/Batflightpathlegalprotectionarticle_FinalVersionSep2007.pdf.

Goss-Custard J. D. & Verboven N. (1993). Disturbance and feeding shorebirds on the Exe Estuary. Wader Study group Bulletin, 68: 59-66.

Hundt, L. (2012). Bat Survey Good Practice Guidelines. 2nd edition. Bat Conservation Trust.

Institute of Ecology and Environmental Management (2006). Guidelines for Ecological Impact Assessment in the United Kingdom. IEEM, Winchester.

Kirby, J., Drewitt, A., Chivers, L. and Saunders, R. (2000). Key habitat attributes for birds and bird assemblages in England. English Nature Research Reports. Part 1. No. 359. English Nature, Peterborough.

Joint Nature Conservation Committee (2008). UK Biodiversity Action Plan Priority Definitions. JNCC Publications, Peterborough.

Joynt, G., Parker, T., and Fairbrother. V. 2008. The Breeding Birds of Cleveland: A tetrad Atlas 1999-2006. Teesmouth Bird Club.

Liley , D. & Fearnley, H. (2011). Bird Disturbance Study, North Kent 2010/11. Footprint Ecology.

Marine Conservation Society (2013). Good Beach Guide, Saltburn [online]. Available at: http://www.goodbeachguide.co.uk/beach/saltburn [Accessed 05/06/2013].

Natural England (undated) Standing Advice for Protected Species. http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/

Natural England (undated) Nationally Significant Infrastructure Projects and EPS mitigation licence. http://www.naturalengland.org.uk/Images/wml-g36_tcm6-28566.pdf

Natural England (2012). Natural England Technical Information Note TIN051: Bats and onshore wind turbines Interim Guidance Second Edition February 2012.

Peak Ecology (2014). Golden Plover and Lapwing – desk based assessment and additional field surveys Dogger Bank Teesside A & B Onshore Electrical Connection. Peak Ecology, Bakewell.

Smit C.J. & Visser J.M. (1993). Effects of disturbance on shorebirds: a summary of existing knowledge from the Dutch Wadden Sea and Delta area, Wader Study Group Bulletin, 68: 6-19.

Stroud, D.A., Chambers, D., Cook, S., Buxton, N., Fraser, B., Clement, P., Lewis, P., McLean, I., Baker, H. & Whitehead, S (Eds.). (2001). The UK SPA network: its scope and content. JNCC, Peterborough.

Tees Valley Biodiversity Action Plan (2012). http://teesvalleynaturepartnership.org.uk/wp-content/uploads/2012/11/Tees-Valley-priority-habitats-and-species-updated-5-jan-2012-pdf.pdf.

Tensen, D. & Zoest, J. van (1983). Keuze van hoogwatervluchtplaatsen op Terschelling. Unpubl. Report L. U. Wageningen/ RIN Texel: 71pp.

Verboom B. & Huitema H. (1997). The importance of linear landscape elements for the pipistrelle *Pipistrellus pipistrellus* and serotine bat Eptesicus serotinus. Landscape Ecology 12:117-125.

