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UK Onshore Scheme

Environmental Statement

Volume 2 Document ES-2-C.05

Chapter 21

Ecology (Proposed Converter Station)

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Environmental Statement Volume 2			
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ES-2-A.03	Ch03	The UK Onshore Scheme	
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Glossary & Abbreviations

Glossary of Terms	
Term	**Meaning**
Alternating Current (AC)	Electric power transmission in which the voltage varies in a sinusoidal fashion. This is the most common form of electricity transmission and distribution.
Ancient Woodlands	Ancient Woodlands are those which have had continuous woodland cover since 1600AD to the present day. Clearance at some time for underwood or timber production does not exclude a wood from this category.
Base scheme design	The design of the UK Onshore Scheme for the purposes of the planning application.
Biodiversity Action Plan	An agreed plan for habitat or species, which forms part of the UK commitment to biodiversity. The UK BAP has now been superseded by the BAP website http://www.ukbap.org.uk Biodiversity 2020 Strategy (which continues to prioritise the S41 list, setting national targets for the period to 2020) and the UK Post-2010 Biodiversity Framework (which shows how these contribute to targets at the European level). Whilst the UK BAP is no longer formally recognised, elements of the supporting research and resources still form the basis of work at a more local level.
Connection point	The existing Bicker Fen 400 kV Substation; the point on the National Electricity Transmission System (NETS) where Viking Link connects.
Converter station	Facility containing specialist equipment (some indoors and some potentially outdoors) for the purposes of converting electricity from AC to DC or DC to AC.
Converter station site	The proposed site encompassing the converter station operational area and associated landscaping, drainage as well as land required temporarily for construction.
Converter station zone	The proposed zone containing the converter station, buildings and outdoor electrical equipment and associated hardstanding within a security fence.
Culvert	A channel or pipe that carries water below the level of the ground
Cumulative Effects	The assessment of the impact on the environment which results from the incremental impact of an action when added to other past, present or reasonably foreseeable actions regardless of what agency or person undertakes such actions. Cumulative impact can result from individually minor but collectively significant actions taking place over a period of time.
dB LA	The dB LA figure is used to relate better to the loudness of the sound heard. The dB LA figure corrects the variation in the ear's ability to hear different frequency and provides a good representation of how loud sound is received.

Glossary of Terms	
Term	**Meaning**
Direct Current (DC)	Electric power transmission in which the voltage is continuous. This is most commonly used for long distance point to point transmission.
Ecological Clerk of Works	Suitably qualified ecologist responsible for the planning and implementation of ecological mitigation prior to and during construction works on site.
Ecological Impact Assessment	A standard process of assessing impacts of development on features of nature conservation value developed by CIEEM.
Embedded mitigation	How the scheme has been specifically designed to avoid or minimise the occurrence of adverse environmental effects.
Environmental DNA	DNA that can be extracted from environmental samples, in this case great crested newt DNA in water bodies.
Equivalent Continuous Sound Level (Leq)	Sound levels tend to fluctuate, and as such an 'instantaneous' measurement like sound pressure level cannot fully describe many real-world situations. A summation can be made of the measured sound energy over a certain period, and a notional steady level can be calculated which would contain the same total energy as the fluctuating sound. This notional level is termed the equivalent continuous sound level Leq. Leq can be determined over any time period, which is indicated as Leq,T where T is the time period (e.g. Leq,24h). In mathematical terms, for n discrete sound level measurements, Leq is given by: Leq,T = 10 log10 (t1 x 10L1/10 + t2 x 10L2/10 +… tn x 10Ln/10)/T where t1 = time at level L1 dB; t2 = time at level L2 dB; and T = total time
European Sites	SACs (including candidate SACs (cSACs)) and designated under the Habitats Directive for the protection of flora, fauna and habitats, and SPAs (including proposed SPA) are designated under the Birds Directive for the protection of rare, vulnerable and migratory birds. Together with Ramsar sites these combine to create a Europe-wide 'Natura 2000' network of designated sites.
Fauna	All of the animals in a given area
Favourable Conservation Status	When population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats; and the natural range of the species is neither being reduced nor is likely to be reduced in the foreseeable future; and there is, and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis" (Habitats Directive, Article 1(i)).
Flora	All of the plants in a given area
Habitat	The natural home or environment of an animal, plant, or other organism.

Glossary of Terms	
Term	**Meaning**
Internal Drainage Board	A type of operating authority which is established in areas of special drainage need in England and Wales with permissive powers to undertake work to secure clean water drainage and water level management within drainage districts.
Invertebrates	Animals without backbones
Joint Nature Conservation Committee	The public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.
Limits of Deviation	These define the maximum extents of the corridor for which planning permission is sought and within which proposed DC and AC cable routes may be installed.
Maximum Sound Pressure Level or Maximum Noise Level	This is the maximum RMS sound pressure level occurring within a specified period. The time weighting is usually specified, such as in LFmax
Mitigation	Measures which are incorporated into the design or implementation of a development project for the purpose of avoiding, reducing, remedying or compensating for its adverse environmental impacts. It may also include measures to include environmental benefits.
Modified neutral grassland	The neutral grassland categories detailed within the Phase 1 Habitat Survey Handbook are concentrated on grassland associated with rural situations (pastures and meadows), as such it was agreed with JNCC in 2005 (P. Gateley, pers. comm.) that neutral grassland habitats that don't easily fit within these categories, usually within urban or industrial areas, can be referred to as modified neutral grassland – 'Modified neutral grassland is not derived from agricultural grassland and the terms semi-improved and improved do not apply. Some modified neutral grassland may be species-rich but many swards are dense, coarse and species-poor. Modified neutral grassland naturally regenerates on disturbed ground and is unmanaged. It most commonly occurs in urban areas and on post-industrial land'.
Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
Multi-Agency Geographic Information for the Countryside	Searchable mapping website which, among other things, displays location of statutory sites of nature conservation interest and important/notable habitats.

Glossary of Terms	
Term	**Meaning**
National Nature Reserve	National Nature reserves are designated under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981 (as amended) primarily for nature conservation, but can also include sites with special geological or physiographic features. They were established to protect the most important area of wildlife habitat and geological formations in Britain, and as places for scientific research. All NNR's receive SSSI designation under The Countryside and Rights of Way Act 2000 and The Wildlife and Countryside Act 1981 (As amended)
Natura 2000	Network of nature protection areas established under the 1992 Habitats Directive and 1979 Birds Directive (includes SPA, SAC, and Ramsar sites). See also 'European Site'.
Natural England	A Government Agency promoting the conservation of England's wildlife and natural features and is responsible for designating National Nature Reserves, identifying Sites of Special Scientific Interest and for advising a wide range of bodies and individuals including the Government on matters affecting Nature Conservation.
No main habitat but additional habitats present	This priority habitat category is taken to mean that although the habitats present do not fit into the defined S41 principal habitat descriptions, they may exhibit some features of S41 principal habitats and provide important supporting habitat and functions
Phase 1 Habitat Survey	The Phase 1 habitat classification and associated field survey technique provides a relatively rapid system to record semi-natural vegetation and other wildlife habitats. Each habitat type/feature is defined by way of a brief description and is allocated a specific name, an alpha-numeric code, and unique mapping colour. The system has been widely used and continues to act as the standard 'phase 1' technique for habitat survey across the UK
Ramsar	The convention on wetland's (Ramsar, Iran, 1971) called the 'Ramsar Convention') is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their wetlands of International Importance and to plan for the wise use and sustainable use, of all the wetlands in their territories.
Residual Effect	The effect left over once the development is constructed and operational.
Rochdale Envelope	This defines the parameters of the proposed converter station for which planning permission is sought including its location, layout and dimensions.
Scoping	Scoping is the process of determining the content and extent of matters that should be covered in the environmental information to be submitted to a competent authority or other decision making organisation
Section 41	A list of species and habitats of principal importance in England in the NERC Act 2006

Glossary of Terms	
Term	**Meaning**
Site of Special Scientific Interest	The highest national level of protection afforded to nature conservation sites in the United Kingdom. SSSIs are the basic building block of site-based nature conservation legislation in the UK.
Special Area of Conservation	Strictly protected sites, classified in accordance with the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC. Article 3 of the Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the habitats listed in Annex I and species listed in Annex II. Candidate SAC (cSAC) are those which have been identified and the process of designation is in progress.
Special Protection Area	Strictly protected sites, classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds 79/409/EEC 1979. SPAs are classified for rare and vulnerable birds (as listed on Annex I of the Directive), and for regularly occurring migratory species. Proposed SPA (pSPA) are those which have been identified and the process of designation is in progress.
Species	A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding.
The Countryside and Rights of Way Act 2000	Amends the WCA, expanding the terms of offences to include reckless activity. The main national legislation relating to wildlife and nature conservation. Also provides for the designation and protection of SSSIs.
UK Onshore Scheme	UK Onshore Scheme from MLWS to the connection point comprising underground AC and DC cables, converter station and access road.

List of Abbreviations	
Abbreviation	**Meaning**
AC	Alternating Current
AOD	Above Ordnance Datum
ASNW	Ancient Semi-Natural Woodland
BBC	Boston Borough Council
BBS	Breeding Birds Survey
BCT	Bat Conservation Trust
BoCC	Birds of Conservation Concern
BS	British Standard
BTO	British Trust for Ornithology
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CRoW Act	The Countryside and Rights of Way Act 2000

List of Abbreviations	
Abbreviation	**Meaning**
DC	Direct Current
DEFRA	Department for the Environment, Food and Rural Affairs
DSI	Ditch Suitability Index
EA	Environment Agency
EC	European Commission
EcCOW	Ecological Clerk of Works
EcIA	Ecological Impact Assessment
ECoW	Environmental Clerk of Works
eDNA	Environmental DNA
EIA	Environmental Impact Assessment
EPS	European Protected Species
ES	Environmental Statement
FCS	Favourable Conservation Status
GB	Great Britain
GCN	Great Crested Newt
GLNP	Greater Lincolnshire Partnership
ha	hectare
HDD	Horizontal Directional Drilling
HSI	Habitat Suitability Index
IDB	Internal Drainage Board
JNCC	Joint Nature Conservation Committee
km	kilometre
km^2	square kilometre
kV	kilovolt
LBAP	Local Biodiversity Action Plan
Leq	Equivalent Continuous Sound Level
Lmax	Maximum Sound Pressure Level or Maximum Noise Level
LoD	Limits of Deviation
LPA	Local Planning Authority
LWS	Local Wildlife Site
LWT	Lincolnshire Wildlife Trust
m	metre
Magic Map	Multi-Agency Geographic Information for the Countryside

List of Abbreviations	
Abbreviation	**Meaning**
mAOD	metres Above Ordnance Datum
mm	millimetre
NERC	Natural Environment and Rural Communities Act (2006)
NGR	National Grid Reference
NGVL	National Grid Viking Link Limited
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPS	National Policy Statements
NVC	National Vegetation Classification - The National Vegetation Classification (NVC) is one of the key common standards developed for the country nature conservation agencies. The original project aimed to produce a comprehensive classification and description of the plant communities of Britain, each systematically named and arranged and with standardised descriptions for each
PPG	Pollution Prevention Guidance
PRoW	Public Rights of Way - A footpath, bridleway or restricted byway on which the public have a legally protected right to pass and re-pass.
RAMs	Reasonable Avoidance Measures
RSPB	Royal Society for the Protection of Birds
S41	Section 41 habitats and species of principal importance as listed in the NERC Act 2006
SAC	Special Area of Conservation
Sch1	Bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 as amended
Sch5	Animal species listed on Schedule 5 of the Wildlife and Countryside Act 1981 as amended
Sch8	Plant species listed on Schedule 8 of the Wildlife and Countryside Act 1981 as amended
SHDC	South Holland District Council
SNCI	Site of Nature Conservation Interest
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TEP	The Environment Partnership Ltd
UK	United Kingdom
VP	Vantage Point

List of Abbreviations	
Abbreviation	**Meaning**
WCA	Wildlife and Countryside Act 1981 (as amended)

1 Introduction

1.1 Introduction

1.1.1 This chapter has been prepared by TEP. It reports the results of baseline studies and the assessment of the potential impacts of the proposed converter station (including the proposed Alternating Current (AC) cable route and proposed permanent access road) on Ecology. Table 21.1 below sets out the structure of the Environmental Statement (ES) with respect to Ecology. Reference should be made to other documents which form part of the ES as appropriate.

1.1.2 Impacts on ecology are interrelated with impacts on Landscape and Visual Amenity (Chapter 22), Water Resources and Hydrology (Chapter 19) and Noise and Vibration (Chapter 26). Reference should also be made to their relevant chapters and Cumulative Effects (Chapter 28).

Table 21.1 Environmental Statement: Ecology

ES Reference	ES Volume	ES Chapter	Content
ES-2-B.06	2	10	Main Report: Proposed Underground DC Cable
ES-2-C.05	**2**	**21**	**Main Report: Proposed Converter Station**
ES-3-B.01	3	10	Figures: Proposed Underground DC Cable
ES-3-C.01	3	21	Figures: Proposed Converter Station
ES-4-B.06	4	10	Technical Appendices: Proposed Underground DC Cable
ES-4-C.05	4	21	Technical Appendices: Proposed Converter Station

1.2 Chapter Structure

1.2.1 The remainder of this chapter is structured as follows:

- Section 2. Approach to Assessment. Describes the approach to the identification and assessment of impacts including approach to consultation, scope of the assessment and methods of baseline data collection and ecological impact assessment.
- Section 3. Basis of Assessment. Sets out the key assumptions which have been made in undertaking the impact assessment.
- Section 4. Planning Policy and Legislative Considerations. Sets out the key legislation and policy of relevance to ecology and protected species with respect to development.
- Section 5. Baseline Conditions. Reports the results of desktop and field studies undertaken to establish existing conditions.

- Section 6. Potential Impacts. Identifies the potential impacts on ecology which may occur as a result of construction, operation and decommissioning.
- Section 7. Mitigation. Identifies the mitigation which is proposed including measures which are incorporated into the siting, design and construction of the converter station.
- Section 8. Residual Effects. Reports the residual effects which remain taking into account proposed mitigation and identifies whether these are significant or not.
- Section 9. Monitoring. Identifies any proposed short, medium or long term monitoring which is proposed to be undertaken during construction and/or operation.
- Section 10. Cumulative Effects. Identifies the inter-project cumulative effects which may occur in combination with other developments and intra-project cumulative effects which may occur between the separate elements of the Onshore Scheme.
- Section 11. Summary of Assessment. Provides a summary of the key findings of the impact assessment.
- Section 12. References.

2 Approach to Assessment

2.1 Introduction

2.1.1 This section describes the approach to the identification and assessment of impacts resulting from the construction, operation and decommissioning of the proposed converter station, permanent access road and AC cable route (including connection works) on Ecology.

2.2 Summary of Consultation

Scoping Opinion Review

2.2.1 Table 21.2 summarises the issues raised in the scoping opinion in relation to Ecology for the proposed converter station, permanent access road and proposed AC cable route and outlines how and where this has been addressed in subsequent sections of this chapter. A copy of the Scoping Opinion is included in Appendix 4.1.

Table 21.2 Scoping Opinion (Ecology)

Consultee	Summary of Comment	How and where addressed
Boston Borough Council (BBC)	Comments based on Natural England's (NE) scoping response which is summarised below.	See response to NE comments below
Environment Agency (EA)	No comments relating to Ecology	N/A
Lincolnshire County Council (LCC)	Suggest that any semi-natural habitats are surveyed against the Local Wildlife Site (LWS) criteria and any sites suitable for LWS designation are avoided.	Habitat surveys of semi-natural habitats were carried out to a sufficient level of detail to enable assessment against LWS criteria. No habitats met the criteria and therefore avoidance has not been necessary.
Lincolnshire Wildlife Trust (LWT)	Recommended that semi-natural habitats, particularly permanent pasture, are surveyed to LWS criteria and that all designated sites and those meeting LWS criteria are avoided. If not then appropriate mitigation should be applied.	Habitat surveys of semi-natural habitats were carried out to a sufficient level of detail to enable assessment against LWS criteria. No habitats met the criteria and therefore avoidance has not been necessary.
	Provided correct reference for LWS Guidelines for Greater Lincolnshire.	Correct reference noted.

Table 21.2 Scoping Opinion (Ecology)		
Consultee	**Summary of Comment**	**How and where addressed**
Natural England (NE)	Advised that: mitigation for groundwater contamination is also related to designated sites; all Sites of Special Scientific Interest (SSSIs) likely to be impacted are identified and fully assessed; consideration is given to standing advice on survey and mitigation requirements; noise and vibration impacts are assessed and mitigated particularly with respect to protected breeding birds; full assessment of all ecological features is undertaken in line with CIEEM guidelines and national policy; Phase 2 surveys to be undertaken on important habitats; air pollution impacts on key habitats is assessed; climate change effects and adaptation is considered; that ancient woodland is avoided.	All advice regarding groundwater contamination, protected sites, noise and vibration, air quality and climate change has been taken account of in the ecological assessment and is addressed in this chapter where relevant. The assessment has been undertaken in accordance with CIEEM guidelines and national policy. Potentially important habitats were surveyed to Phase 2 level (National Vegetation Classification survey) where required. No ancient woodland is in close proximity to the proposed converter station, permanent access road or proposed AC cable route.
South Holland District Council (SHDC)	Comments based on NE's scoping response which is summarised above.	See response to NE comments above

Additional Consultation

2.2.2 Table 21.3 summarises additional consultation undertaken with relevant statutory and non-statutory consultees in relation to Ecology for the proposed converter station, permanent access road or proposed AC cable route and outlines how and where this has been addressed in subsequent sections of this chapter.

Table 21.3 Additional Consultation (Ecology)		
Consultee	**Nature of additional consultation**	**How and where addressed**
NE	Consultation on Ecological Survey Scope at Shortlisted Terminal Points (Appendix 10.1) including: modified Ditch Suitability Index (DSI) survey for ditches with respect to assessing suitability for great crested newts.	Confirmation from NE that survey methods were acceptable.

Table 21.3 Additional Consultation (Ecology)		
Consultee	**Nature of additional consultation**	**How and where addressed**
	Consultation on modified environmental DNA (eDNA) sampling approach for ditches due to their linear nature. – May/June 2016	Confirmation from NE that modified eDNA survey approach was acceptable. Addressed in Section 2.4 and Appendix 21.4.
	Meeting to discuss survey progress and results and the scope for future surveys and assessment. – 9 June 2016	Confirmation that survey results thus far would be included in a supporting document to the Scoping Report for review, that winter bird survey effort was sufficient and no further surveys were required.
	Consultation on Ecological Survey Scope – Full Scheme (Appendix 10.2) taking into account approach to remaining surveys, including our approach for a presence/absence water vole survey. – July 2016	Confirmation from NE that revised survey approach acceptable, including presence/absence water vole survey method.
	Submission of interim survey results report to accompany Scoping Report for comment. – August/September 2016.	Confirmation from NE that no specific issues need to be raised.
	Meeting to update on survey progress and results, approach to assessment and mitigation. – March 2017	Confirmation that natural re-vegetation of drains rather than reseeding with a seed mix was acceptable. This is discussed in Section 3.2.
	Consultation on proposed mitigation approach for protected species - July 2017	Confirmation from NE that satisfied with the proposed approach to mitigation for protected species.
LWT	Introductory discussion on progress so far and key issues that LWT might have. - June 2016	No specific comments relating to the proposed converter station site.
	Consultation on Ecological Survey Scope – Full Scheme (Appendix 10.2) taking into account approach to remaining surveys, including our approach for a presence/absence water vole survey. - July 2016	Recommendation from LWT that semi-natural habitats are also surveyed to a sufficient standard to enable assessment against the LWS criteria for Lincolnshire. Query regarding water vole survey approach which was clarified and confirmed as acceptable. Recommendation fed into assessment process.

Table 21.3 Additional Consultation (Ecology)		
Consultee	**Nature of additional consultation**	**How and where addressed**
	Submission of interim survey results report to accompany Scoping Report for comment. – August/September 2016	No specific comments from LWT regarding results and one query relating to great crested newt information provided by NE which was resolved.
Royal Society for the Protection of Birds (RSPB)	Correspondence on progress so far and key issues the RSPB might have. – June 2016	No specific comments from RSPB on work undertaken so far.
Black Sluice Internal Drainage Board (IDB)	Correspondence on progress so far and key issues the IDB might have. – December 2016	IDB has no key issues and provided their Biodiversity Action Plan and information on water voles and bat surveys. All information is taken account of in this chapter.

2.3 Scope of Assessment

Spatial Scope

2.3.1 The spatial scope of this chapter reflects the 'zone of influence' of the base scheme design. This is the area over which the ecological features present may be subject to significant effects. To identify these zones consideration was given to potential direct and indirect effects that may occur during the construction and operation of the project.

2.3.2 From the outset, desktop study information was obtained for a large study area (Figure 21.1) to ensure that a suitable buffer around all potential areas for the base scheme design was obtained, enabling a robust assessment of ecological constraints during site selection and cable routeing. The following buffers have been applied to the planning application boundary for the base scheme design with respect to designated sites and protected species information:

- 10 km for internationally designated sites,
- 2 km for nationally designated sites; and
- 1 km for non-statutory designated sites, protected species and habitats and species of principal importance records.

2.3.3 The zone of influence for the field survey study area and subsequent assessment comprises the base scheme design including all temporary work areas and access routes along with any buffers required to take account of survey methods and species specific zones of influence. The study area for each ecological feature is presented in the Field Studies section (Section 2.4) and corresponding appendices and figures. These are summarised below:

- Extended Phase 1 habitat survey – Base scheme design plus adjacent habitats for context;
- Hedgerow survey – Base scheme design area;

- Great crested newt *Triturus cristatus* surveys:
  - Habitat Suitability Index/Ditch Suitability Index surveys – Base scheme design area plus 500 m buffer from the proposed converter station and permanent access road and base scheme design area plus 250 m buffer of the proposed AC cable.
  - Presence/ absence (eDNA) - Base scheme design area plus 250 m buffer from all elements;
  - Population estimate (traditional survey) - Base scheme design area plus 250 m buffer from converter station and base scheme design area plus 50 m buffer from landfall and underground cable;
- Bat survey – Base scheme design area;
- Water vole *Arvicola amphibius* and otter *Lutra lutra* survey – Watercourse crossing points within base scheme design area plus 100 m buffer upstream and downstream;
- Badger *Meles meles* survey – Base scheme design area plus 30 m buffer;
- Winter bird survey – Base scheme design area plus 500 m buffer;
- Breeding bird survey – Base scheme design area plus 100 m buffer; and
- Reptile survey – Base scheme design area.

Temporal Scope

2.3.4 The construction phase is anticipated to be 24 to 36 months from approximately 2019 to 2022. The operational lifetime of the proposed converter station is approximately 40 years, which will likely be extended beyond this following refurbishment and plant replacement. Following this, decommissioning will be undertaken.

2.3.5 Temporary impacts will generally occur during construction with key activities including site clearance, site levelling, soil stripping, construction of the permanent access road, installation of drainage, construction of the converter station and proposed AC cable route followed by reinstatement and landscaping works. Temporary impacts with relevance to ecology will include the potential for damage and degradation during construction as well as habitat loss in temporary construction areas. With respect to fauna, temporary impacts may include displacement, disturbance and the potential for killing or injury. Temporary fragmentation of habitats, leading to severance or barrier effects on commuting and dispersing fauna, may also occur as a result of construction activities.

2.3.6 Longer term, operational and permanent impacts will include the length of time taken for habitats to mature and establish following reinstatement of temporarily disturbed areas or planting within the landscaped areas. Operational impacts relating to ecology can include disturbance and displacement of fauna as a result of noise and lighting during normal operations. Permanent habitat loss and displacement of foraging or breeding fauna due to the converter station and access road footprint will occur, and there is also the potential for permanent fragmentation of habitats and severance or barrier effects on commuting and dispersing fauna.

2.4 Identification of Baseline Conditions

Desk Studies

2.4.1 Information regarding designated sites, together with protected and notable habitats and species, was collated from the sources listed in Table 21.4. Full details are presented in Appendix 21.1.

Table 21.4 Sources of Desktop Study Information

Organisation	Information Supplied
Black Sluice IDB	Black Sluice Drainage Board Biodiversity Action Plan (BAP) 2014 (Ref 21-1) Information regarding water voles and bat surveys
Forestry Commission (FC)	Ancient woodland and other woodland sites.
Greater Lincolnshire Nature Partnership (GLNP)	Non-statutory designated sites boundaries and citations, protected species and habitats and species of principal importance records. Lincolnshire BAP (2011) (Ref 21-2) LWS Guidelines for Greater Lincolnshire
LWT	Presentation: Highways for Wildlife – Defending and extending the UK's road verge network for biodiversity (Ref 21-3)
Magic Map	Statutory protected sites & habitats of principal importance. Information for granted European Protected Species (EPS) licences.

Field Studies

2.4.2 Full details of methods, timings and limitations of field surveys undertaken to establish baseline data for the base scheme design and its immediate surrounds are provided in Appendices 21.2 to 21.10. These are summarised below.

Extended Phase 1 Habitat Survey

2.4.3 The survey was carried out in accordance with the Phase 1 habitat survey assessment methods (Ref 21-4) and the Guidelines for Preliminary Ecological Appraisal (Ref 21-5). Habitat types were mapped and dominant vegetation species noted. Any invasive species were also recorded. In addition, field signs and potentially suitable habitats for legally protected species or species which are listed under the obligations of Section 41 (S41) of the NERC Act 2006 (Ref 21-6), or are included in the Local Biodiversity Action Plans (LBAPs) (Ref 21-1, 21-2) were mapped and noted, in order that they could be fed into the relevant detailed species survey or included within the assessment of the base scheme design as a whole.

2.4.4 The optimum time for extended Phase 1 surveys is April to mid-October. Surveys for the base scheme design were undertaken during May 2016 for the proposed converter station and April to June 2017 for the permanent access road and proposed AC cable route.

Limitations

2.4.5 All surveys were undertaken within the optimum time period. Access was possible to all of the study areas.

Hedgerow Survey

2.4.6 Hedgerows likely to be affected by the base scheme design were surveyed and target notes made as part of the extended Phase 1 habitat survey. Where species diversity and features of the hedgerow indicated it may qualify as 'Important' under the Hedgerow Regulations 1997 (Ref 21-7) (wildlife and landscape criteria), a survey in accordance with the Hedgerow Regulations was also undertaken. This survey applied to one hedgerow within the base scheme design which was undertaken on 4th April 2016 when woodland ground flora were visible and identifiable.

Limitations

2.4.7 No limitations to the hedgerow survey were encountered with respect to access. Although slightly earlier than the recommended optimum survey period of mid-April to mid-June, plant growth was sufficiently advanced to enable identification of spring woodland ground flora.

Great Crested Newt Survey

2.4.8 A sequential approach to great crested newt (GCN) surveys was agreed with stakeholders and implemented to (a) identify waterbodies (ponds and ditches), (b) assess their suitability for GCN, (c) determine presence or likely absence of GCN and, if present, (d) confirm the population size class if found to be present. Full details of individual survey methods and limitations are detailed in Appendix 21.4.

2.4.9 Table 21.5 provides a summary of the survey scope according to distance from the converter station site, permanent access road and the AC cable and the timing of the surveys.

Table 21.5 Great Crested Newt Survey Scope and Timing

Survey Method	Distance from proposed converter station site		
	0-50m	51-250m	251-500m
HSI and DSI	May 2016	May 2016	May 2016
Presence/absence (traditional and eDNA)	May 2016	May 2016	-

Table 21.5 Great Crested Newt Survey Scope and Timing			
Survey Method	**Distance from proposed converter station site**		
	0-50m	**51-250m**	**251-500m**
Population estimate (if GCN present)	April to June 2017	April to June 2017	-
Survey Method	**Distance from permanent access road and proposed AC cable route**		
	0-50m	**51-250m**	**251-500m**
HSI and DSI	May 2016 and May 2017	May 2016 and May 2017	-
Presence/absence (traditional and eDNA)	May 2016 and June 2017	May 2016 and June 2017	-
Population estimate (if GCN present)	April to June 2017	-	-

2.4.10 Table 21.6 identifies the waterbodies (ponds and ditches) subject to GCN survey during the sequential survey approach.

Table 21.6 Waterbodies Subject to Great Crested Newt Survey			
Survey Method	**Criteria**	**Pond Refs**	**Ditch Refs**
Preliminary Scoping	All waterbodies (ponds and ditches) identified on aerial/OS maps within survey areas	P175, P192	D88, D600, D601, D602, D605, D607, D609, D611, D614, D619, D621, D622, D625, D629, D630, D632, D638, D639, D640, D641, D645, D646, D648, D650, D652, D654, D656, D660, D662, D667, D676, D679, D681, D684, D686, D692, D693, D698, D699, D700, D701, D703, D704, D706, D708, D709, D710, D712, D713, D716, D717, D718, D719, D720, D721, D722
Waterbodies not accessible	Ponds and ditches for which permission to access for survey was not granted for HSI or DSI assessment (no further survey possible)	N/A	D703

Table 21.6 Waterbodies Subject to Great Crested Newt Survey			
Survey Method	**Criteria**	**Pond Refs**	**Ditch Refs**
Waterbodies not suitable for HSI/DSI assessment	Ponds and ditches accessed for HSI/DSI assessments but unsuitable for further survey e.g. no longer present, dry, completely vegetated.	N/A	D88, D601, D605, D607, D609, D614, D625, D638, D639, D645, D648, D650, D652, D654, D656, D660, D662, D667, D676, D684, D686, D698, D701, D704, D706, D710, D712, D717, D718, D719, D720, D721, D722
HSI and DSI	All accessible waterbodies suitable for assessment (ponds and ditches) identified on aerial/OS maps within survey areas (refer to Table 21.5)	P175, P192	D602, D611, D619, D621, D622, D629, D630, D632, D640, D641, D646, D679, D681, D692, D693, D699, D700, D708, D709, D713, D716
Waterbodies not carried forward	Waterbodies which were scoped out according to habitat assessment criteria.	P192	D602, D621, D640, D641, D699, D708, D713
Presence/absence (eDNA)	All accessible ponds within survey areas which returned 'Good' or 'Excellent' HSI scores. All accessible ditches within survey areas which returned positive or neutral scores.	N/A	D611, D622, D629, D630, D632, D679, D681, D692, D693, D700, D709, D716
Presence/absence (traditional)	All waterbodies carried forward following HSI/DSI which were not suitable for eDNA sampling.	N/A	N/A
Population size class assessment (traditional)	All waterbodies confirmed to support GCN during presence/absence survey (eDNA/traditional). All accessible waterbodies with historical GCN records.	N/A	N/A
Waterbodies requiring further survey	Waterbodies still requiring survey either to confirm population size class or because they are now within 250 m of the base scheme design.	P175	D611 (inconclusive eDNA), D619, D646

Limitations

2.4.11 Lack of agreed land access or confirmation of access initially prevented survey of Ditch 703 which accounted for only 2% of scoped waterbodies. Once access was agreed later in the survey season, the presence of breeding marsh harriers in the vicinity precluded further access

to the waterbody; being a Wildlife and Countryside Act 1981 (Ref 21-8) Schedule 1 species these birds could not be disturbed.

2.4.12 Desktop records indicated that a 'small' population of GCN was recorded at Bicker Fen Substation in 2015, with GCN recorded in Pond 175 and Ditch 611. eDNA sampling and traditional surveys were attempted for Pond 175 however these proved not to be possible due to dense emergent vegetation preventing access to the open water in addition to identification of the breeding marsh harriers.

2.4.13 Ditch 611 within the Bicker Fen Substation returned an 'inconclusive' eDNA result for GCN presence/absence. Traditional surveys to confirm presence/absence of GCN within D611 were not possible due to the late stage in the survey season by the time access for DSI assessment and eDNA sampling was agreed.

2.4.14 Ditches D619 and D646 were DSI assessed but were then scoped out of further GCN survey as they were initially more than 250 m from the proposed converter station site. Following revision of the base scheme design, D619 and D646 subsequently fell within 50 m of the base scheme design area. Due to their favourable DSI scores, pre-commencement survey of D619 and D646 will therefore be required as it was not possible to survey them within the 2017 GCN breeding season, due to the design revision occurring at too a late stage in the survey season.

2.4.15 HSI and DSI surveys were not all undertaken within the optimum survey period of May to September due to a combination of the project programme and when access was available. Aquatic vegetation may not have had sufficient time to establish for an accurate macrophyte coverage assessment to be made. However, seasonality was taken into consideration by surveyors and remnant vegetation was used to estimate vegetation density during optimum survey periods. Ditches within the area are regularly dredged and vegetation cut so this is unlikely to have significant constraints to the assessment.

2.4.16 Additional limitations regularly encountered when undertaking eDNA sampling and traditional surveys included: varying water levels and drying of waterbodies between surveys; presence of dense vegetation on banks and within ditches; and polluted waterbodies.

2.4.17 With respect to traditional surveys, the ditches were generally unsuitable for bottle trapping due to their steep sides and shallow water and therefore torching, egg searching and hand netting were employed as the three methods required to comply with the English Nature guidelines (Ref 21-9). However, the steep banks and dense vegetation also on occasion prevented hand netting from being undertaken. Steep banks prevented safe access for egg searching at some ditches and dense vegetation reduced effectiveness of torch survey. These constraints to survey were unavoidable.

2.4.18 As a result, it has not been possible to employ three different methods of traditional GCN survey at every waterbody in accordance with guidelines; methods for establishing the presence or likely absence and estimating the population size class of GCN at these locations have therefore been limited. However data interpretation has considered survey limitations and a precautionary approach mitigation was adopted appropriate to the level of risk or uncertainty introduced by data

limitations. Consequently, survey limitations encountered are not considered to limit the findings of the assessment.

Bat Survey

2.4.19 Bat surveys for the base scheme design have comprised two elements:

- Roost surveys – to determine the presence of roost sites or potential roost sites in areas where these may be lost or impacted by the base scheme design; and
- Activity surveys – to assess the connectivity and use of the landscape by commuting and foraging bats along the route of the proposed access road, where permanent severance effects may potentially result.

2.4.20 The timings of bat surveys undertaken for the base scheme design are summarised in Table 21.7. Methods implemented and limitations encountered for the surveys are detailed in Appendix 21.5.

Table 21.7 Bat Survey Effort

Survey Method	Proposed converter station	Permanent access road	Proposed AC Cable
Preliminary daytime bat roost appraisal (trees, one culvert and two structures present in survey area)	May 2016	April 2017	May 2016
Nocturnal emergence surveys	Not required (no trees with roost suitability present)	Not required (no trees with roost suitability present)	June and August 2016
Activity transect scoping visit	May 2016	April 2017	April 2017
Activity transect and static surveys	Scoped out	May and June 2017 (August 2017 to be submitted in Supplementary report)	June and September 2016 (partial coverage)

Roost Surveys

2.4.21 The footprint of the proposed converter station site does not contain any trees. A small hard standing compound is located on the southern edge of the proposed converter station site, which contained a wooden shed and metal containers. A small brick built culvert is present in the north east corner of the proposed converter station site. Trees occur across the permanent access road and proposed AC cable route, comprising small pockets of plantation, hedgerow trees and, along the A52, a line of individual trees.

2.4.22 A preliminary daytime bat roost appraisal was completed in May 2016, March 2017 and April 2017 of the trees across the base scheme design and of the shed, containers and culvert in May 2016. The trees and structures were categorised in accordance with the criteria for roost suitability identified in the Bat Conservation Trust (BCT) Good Practice Guidelines (Ref 21-10).

2.4.23 The culvert, shed and containers were scoped out from further roost surveys as they were assessed during the preliminary roost appraisal to have negligible suitability for roosting bats.

2.4.24 One tree within the survey area for the preliminary bat roost appraisal was assessed to have moderate suitability for roosting bats (T286) and one tree was assessed to have low suitability (T288). Their locations are shown on Figure 21.4. Tree T286 was assessed to be potentially adversely affected by the base scheme design and was therefore carried forward for further survey. Tree T286 was subject to two dusk emergence surveys on 21st June and 8th August 2016.

Activity Surveys

2.4.25 The footprint of the proposed converter station comprises a single large arable field with bordering margins of neutral grassland. There are no trees or hedgerows present and no drains (wet or dry) cross the field. Permanent habitat loss within the proposed converter station would therefore not result in significant disruption to foraging or commuting bats. The permanent access road crosses several ditches, including Hammond Beck, one woodland plantation block and a tree line adjacent to the A52. The permanent access road would result in permanent habitat losses that could potentially result in habitat fragmentation and disruption of foraging and commuting bats. The proposed AC cable route crosses several hedgerows, bisects a block of woodland plantation and crosses poor semi-improved grassland. Temporary fragmentation effects arising as a consequence of the works may have the potential to result in disruption to foraging and commuting bats.

2.4.26 An activity survey was therefore completed to determine the levels of bat activity and patterns of use of habitats along the permanent access road. Based on the dominance of agricultural habitats, the activity survey along the permanent access road comprised a walked transect, to be completed three times on 16th May and 29th June 2017 (reported in this Chapter) and in August 2017 (to be submitted within a Supplementary Report to this Environmental Statement (ES)). The transect survey was supplemented by remote monitoring, whereby two broadband static detectors were deployed along the transect route (N4 adjacent to the woodland plantation block and H3, adjacent to Hammond Beck) for a minimum period of five consecutive nights of suitable weather coinciding with each transect survey. Findings from the first and second remote monitoring surveys (17th – 22nd May and 28th June – 4th July 2017) are reported within this Chapter and findings from the third remote monitoring survey (August 2017) will be submitted within a Supplementary Report to this ES.

2.4.27 An activity survey of an associated area which intersects with the northern extent of the proposed AC cable route provides contextual information on the patterns of use in this area. This activity

survey comprised a walked transect which was undertaken twice on 22nd June 2016 and 7th September 2016. Static monitoring of two locations was also undertaken between 22nd and 27th June 2016 and the 7th and 12th September 2016.

Limitations

2.4.28 No limitations with respect to weather or access were experienced during ground based assessments, activity surveys and evening emergence surveys in 2016 or activity surveys in 2017. Limitations relating to weather during static monitoring and to bat species identification based on recorded sonograms are detailed within Appendix 21.5. Data interpretation took these limitations into account. Professional judgement was applied during the impact assessment, which took into account the survey findings in combination with consideration of desktop findings, roost survey findings, habitat structure and landscape connectivity.

Water Vole and Otter Survey

2.4.29 A total of 15 waterbodies considered to provide suitable habitat for water vole and otter following the extended Phase 1 habitat survey will be crossed by, or are adjacent to the proposed converter station, permanent access road or proposed AC cable route. These waterbodies were surveyed for the presence of water vole and otter. A buffer of 100 m upstream and downstream of each crossing point was applied.

2.4.30 Presence/absence water vole surveys were undertaken according to methods agreed with Natural England, whereby presence was confirmed within a waterbody once three field signs were recorded within the surveyed section. Survey techniques and timings were otherwise accordance with the Water Vole Mitigation Guidelines (Ref 21-11) and Water Vole Conservation Handbook (Ref 21-12). The waterbodies were simultaneously surveyed for evidence of otter activity in accordance with current methods (Ref 21-13). The identification of water vole and otter field signs was marked on maps and used to determine the presence/absence of the species.

2.4.31 Waterbodies within the study area for the proposed converter station were surveyed on 20th June and 7th September 2016. The first of the two required visits to waterbodies within the study areas for the permanent access road and proposed AC cable route was completed during 22nd to 24th May 2017. The second visit will be completed in August 2017 and will be reported within a Supplementary Report to this ES.

Limitations

2.4.32 All surveys in 2016 and 2017 were undertaken with full access and during suitable dry weather conditions with no substantial rain in the few days preceding the surveys. However, all ditches had recently been cleaned out (including bank cutting and scraping) prior to the survey visit of September 2016. This activity would likely have removed any field evidence from water voles or otter; however, the application of such management practices across the ditch catchment area

would also reduce the likely suitability of the watercourses for these species, due to disturbance levels.

Badger Survey

2.4.33 Field signs evidencing badger activity were recorded during the extended Phase 1 habitat survey over the 2016 and 2017 survey seasons. Detailed badger surveys were then subsequently undertaken in February - May 2017 across the proposed converter station, permanent access road and proposed AC cable route applying a 30 m buffer. Surveys were undertaken at this time so that vegetation was low and to coincide with a peak in territorial activity. The survey method was based on the standard approach detailed in the Mammal Society publication *Surveying Badgers* (Ref 21-14) and used during the National Badger Survey (Ref 21-15). This systematic walkover included the recording of a range of field evidence including sett locations, latrines, runs, footprints, hairs and foraging evidence.

2.4.34 All evidence of badger activity was mapped, including the locations of setts, latrines, diggings, runs, footprints and hairs (Ref 21-16). The location of each sett entrance was photographed and plotted using GPS and a detailed description of the sett and surrounding habitat collated. General habitat conditions around each of the setts were also recorded. Setts were classified in accordance with Harris *et al*. (Ref 21-14) as either a main, annexe, subsidiary or outlier sett. An assessment of the level of activity of each sett was also undertaken.

Limitations

2.4.35 Access was possible to 100% of the proposed converter station site, permanent access road and proposed AC cable route and land within 30 m buffer. Timing of the survey was optimal. There were no limitations to the badger survey.

Winter Bird Survey

2.4.36 Surveys across the landscape containing the base scheme design comprised a pre-determined point count and transect survey technique (Ref 21-17, Ref 21-18). Detailed methods are described in Appendix 21.8. Surveys were undertaken from public roads and footpaths ensuring that every field within the study area including 500 m buffer could be viewed.

2.4.37 The surveys recorded primary and secondary bird species as follows:

- Primary species included all waders, wildfowl, raptors and any other species associated with The Wash Special Protection Area (SPA)/Ramsar, Gibraltar Point SPA/Ramsar or the Humber Estuary SPA/Ramsar in addition to Schedule 1 (WCA, 1981) (Ref 21-8) bird species.
- Secondary species included all other Birds of Conservation Concern (BoCC) (Ref 21-19).

2.4.38 All primary and secondary species were recorded and mapped directly on the survey map using British Trust for Ornithology (BTO) species codes and behaviour symbology. If a group of birds was recorded, the extent of that group of birds was recorded on the sheet. If any qualifying

species for the Humber Estuary SPA or The Wash SPA were recorded, the time of the record was also noted to reduce the risk of double counting these species.

2.4.39 Surveys were conducted during the periods December 2014 to April 2015 and October 2015 to April 2016.

Limitations

2.4.40 Direct access to all land across the proposed converter station site, permanent access road and proposed AC cable route was not possible during the winter bird surveys. Transect routes and point count locations were selected to ensure that all primary bird species would be detectable, but it is possible that that some secondary bird species could have been missed. However, it is considered that this is not a significant limitation to the survey.

Breeding Bird Survey

2.4.41 Breeding bird surveys were undertaken across the proposed converter station site and permanent access road and a 100 m buffer. The breeding bird surveys employed a transect method, based on the British Trust for Ornithology's (BTO) Breeding Bird Survey (BBS) method with mapping techniques applied as described for the BTO Common Bird Census (CBC) method (Ref 21-20). Bird species, flight paths and behaviours were recorded using standard BTO symbology. Records of protected species or BoCC were highlighted. Trees within the survey area were also checked for signs of occupation by owls and raptors.

2.4.42 Three transect surveys were completed across the proposed converter station on 19th April, 18th May and 21st June 2016. Three transect visits along the permanent access road were undertaken on 3rd (completed on 4th April), 8th May and 5th June 2017.

Limitations

2.4.43 No limitations were experienced whilst undertaking the breeding bird surveys.

Reptile Survey

2.4.44 Habitats with the potential to support reptiles within the survey area were identified from the desktop study and extended Phase 1 habitat survey. Although the habitats across the survey area are generally of low suitability for reptiles, being within an intensely agricultural landscape, a reptile survey was completed within the proposed converter station site, since it will comprise a large scale permanent development.

2.4.45 Reptile survey methods followed standard techniques (Ref 21-21, Ref 21-22, Ref 21-23) employing the use of 0.5m square “tins” deployed in suitable microhabitats at a density of approximately 10 tins per hectare. Seven survey visits were then commenced one week following deployment of the tins. Surveys visits were each completed during suitable weather conditions to view and inspect the tins and walk the site in search of reptiles.

2.4.46 Survey visits were undertaken between 8:30am and 11:00am or between 4:00pm and 6:30pm on the 16th, 18th, 21st, 23rd, 25th, 28th and 30th September 2016.

Limitations

2.4.47 Of the 75 tins deployed, 11 were found to have been moved or damaged on the seventh visit as a result of agricultural activities. Given that no reptiles had been recorded during earlier visits, this is not considered to have influenced the overall findings of the survey or the impact assessment.

2.5 Approach to Assessment

Assessment Guidance

2.5.1 The ecological assessment has been carried out with due consideration for the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (EcIA) (Ref 21-24). The guidelines provide a robust framework for EcIA, which is then informed by the interpretation of contextual information and professional judgement.

Assessment Criteria

Importance of Receptors

2.5.2 The CIEEM EcIA guidance (Ref 21-24) confirms that detailed assessment of ecological features that are 'widespread, unthreatened and resilient to project impacts' is not necessary. It is therefore necessary to determine which ecological features are sufficiently important or sensitive and may potentially be affected by the base scheme design. Decisions on relative importance consider quality, extent, rarity (including local rarity) and threats or declines of a feature. Relevant statutory and non-statutory designations, legislation and policies are taken account of, although not all populations of legally protected species show the same rarity or distribution. Contextual information is therefore presented where relevant (for example, while GCN are afforded statutory protection at a European level, a small population situated within an optimal geographic location is unlikely to be of ecological value at a European level). Importance could also relate to the supportive function of the ecological feature (i.e. providing a buffer, connections or opportunities for expansion or climate change resilience of a neighbouring feature).

2.5.3 The importance of an ecological feature is identified within a defined geographical context; the scales relevant to the base scheme design and its ecological features are presented in Table 21.8. These criteria provide a standardised framework for the assessment but site specific conditions, together with information on the local and wider context are considered as part of the valuation.

Table 21.8 Geographic Context of Important Ecological Features	
Geographic Context	**Criteria**
International and European	Designated or proposed/candidate Special Areas for Conservation (SAC), Special Protection Areas (SPA) and Ramsar Sites and their qualifying features, some of which may depend on land outside the designation boundaries. Candidate or proposed designations are treated as of equal value to fully designated sites. Under the National Planning Policy Framework (NPPF) (Ref 21-25), land that is set aside as compensation for adverse effects of development on European Sites should also be regarded as of European value. Species populations or habitat areas (such as those listed in Annex I, II or IV of the Habitats Directive (Council Directive 92/43/EEC) (Ref 21-26) or Annex I of the Birds Directive (Directive 2009/147/EC) (Ref 21-27)) of international importance due to relative size, rarity or quality of the feature.
National	Designated or proposed SSSIs, National Nature Reserves (NNR), Marine Nature Reserves (MNR) and their qualifying features, some of which may depend on land outside the designation boundaries. A viable area of ancient woodland. Species populations or habitat areas (including legally protected or NERC Act 2006 (Ref 21-6) S41 species or habitats) of national importance due to relative size, rarity or quality of the feature.
County	Designated or proposed County Wildlife Sites (CWS), LWS, Sites of Nature Conservation Importance (SNCI) and their qualifying features where they occur within the designation boundaries. 'Important' hedgerows (as described under the Hedgerows Regulations 1997) (Ref 21-7) where these occur as an extensive network. Species populations or habitat areas (including legally protected or NERC Act 2006 (Ref 21-6) S41 or Nationally Scarce species or habitats) of district or county importance due to relative size, rarity or quality of the feature. Sites should comfortably exceed SNCI criteria if these exist, but not meet SSSI selection criteria.
Local	Local Nature Reserves (LNR) and unless also designated at a higher level, and other nature conservation designations (under local planning policies). Green infrastructure designations where these contribute to local landscape connectivity and/or buffer other ecological features valued at least this geographic scale. Species populations or habitat areas (including legally protected or NERC Act 2006 (Ref 21-6) S41 species or habitats) of local importance due to relative size or quality. Features that appreciably enrich the local ecological resource, although these may themselves be common and widespread, such as long-established hedgerows, woodlands and ponds.

Characterisation of Impact

2.5.4 Although not necessary to comply with CIEEM guidelines, it is good practice to describe potential impacts without and with mitigation. The base scheme design may result in multiple potential impacts on an important ecological feature. The CIEEM approach requires that only those that are likely to occur and have significant impacts need be assessed. A precautionary approach to scoping potential impacts is adopted.

2.5.5 The following characteristics are used to describe impacts:

- Positive or negative, although for the purposes of continuity with other chapters in this ES, the terms beneficial or adverse are used;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

2.5.6 The following four-point scale is used to express the degree of confidence with which the predicted impact may occur. This scale is also applied to the likely effectiveness of mitigation proposals.

- Certain/near certain;
- Probable;
- Possible; or
- Extremely unlikely.

Assessing the Significance of Effects

2.5.7 Once an impact has been characterised it is necessary to determine if the effect is 'significant'. In the context of CIEEM EcIA guidance a significant effect is one that either 'supports or undermines biodiversity conservation objectives for 'important ecological features''. This can include impacts on the structure and function of sites and habitats or the conservation status (i.e. the extent, distribution or abundance) of habitats and species. The decision on significance is made irrespective of the geographical scale at which the ecological feature is valued; if an effect is found not to be significant at the level at which the receptor has been valued, it may be significant at a more local level.

Climate Change

2.5.8 European guidance (Ref 21-28) requires that EIA considers the effects of projects on climate change and on biodiversity. The EC guidance indicates that impacts which are only likely to be experienced in the next 20 years should be based on current weather patterns or near-future projections if available and relevant. Beyond 20 years, identified potential impacts associated

with operation of the base scheme design may need to consider the projected climate. This has been taken into account in the assessment of operational effects.

2.6 Assumptions or Limitations

2.6.1 The assessment is made on the best available data, based on the information that has been gathered from stakeholders, other data sources and the surveys undertaken. Some limitations to surveys were identified and have been discussed in the relevant sections above and the relevant sections of Appendix 21. In addition, the second visit for water vole and otter surveys along with the third visit for bat activity surveys still require completion due to their seasonal restrictions. Once these surveys are completed the assessment will be updated where required and will be submitted within a Supplementary Report. However, the level of survey information gathered to date, taking into account the embedded mitigation and legal compliance and good practice measures detailed in the Basis of Assessment (Section 3), is considered sufficient to allow a robust assessment of the base scheme design.

3 Approach to Assessment

3.1 The Proposed Converter Station Design Assumptions

3.1.1 Cross reference should be made to Chapter 17 (Converter Station) which provides a full description of the construction and operation of the proposed converter station, permanent access road and proposed AC route to Bicker Fen Substation, including connection works.

3.1.2 The key design assumptions which underpin the assessment on ecological features for the proposed converter station, permanent access road and proposed AC route comprise:

- Approximately 9 ha permanent habitat loss for the built elements of the proposed converter station and associated infrastructure;
- Approximately 10 ha permanent change of land use from arable farmland to the attenuation zone (1 ha) and landscape zone (9 ha);
- Approximately 11 ha temporary habitat loss in the proposed converter station site which is categorised as the reinstatement zone;
- Likely 24 hour working required for short periods of time during converter station construction;
- 47 dB maximum noise levels during construction at the nearest Noise and Vibration Sensitive Receptor (NVSR), with construction vehicles generating maximum noise levels of 61 dB at 50m. Assumed 25 dB maximum noise levels at nearest residential NVSR during operation;
- Drainage scheme designed to remove all potential pollutants prior to discharge. Attenuation pond will also provide biodiversity benefit. One outfall to the ditch running adjacent to North Ing Drove required at the proposed converter station as part of site drainage plans, which is anticipated to have a headwall of no more than 3 m^2.
- A new permanent access road (approximately 6 m wide carriageway) which comprises a new junction with the A52 and approximately 2.8 km of new road to the site, requiring seven permanent culverts (approximately 10 m wide) and a bridge crossing of the Hammond Beck. Total permanent habitat loss of approximately 3 ha and temporary habitat loss during construction of approximately 4.5 ha. Post and wire (three to four strands) fencing will demarcate the permanent access road during operation, with gate access to adjacent agricultural land.
- An AC cable route of 2.34 km comprising a maximum 60 m working width (as a reasonable worst case) and 50 m limits of deviation (LoD) either side Maximum of eleven temporary culverts will be required within drains for the temporary haul road along the proposed AC cable route. Stock proof fencing will be used to demarcate the AC cable working width during construction. Heras fencing/boarding will form the boundary to the proposed converter station site.
- Connection works within the existing Bicker Fen 400 kV Substation will require additional switch bays and other associated works within the footprint of the existing Substation.

- Lighting during construction will not typically involve outside working after dark. When illumination of specific construction activities during hours of darkness is required, trailer mounted masts with generator sets will typically be used to illuminate localised areas and will be directional. During commissioning, some tests will be carried out at night and visual inspections of external equipment will be required. Yard lighting will be illuminated during these activities.
- Lighting during operation of the proposed converter station will be motion activated, although there will be periods when lighting is required during night time hours to illuminate specific operations. The security lighting system will be directional, with indicative lighting heights of 5 – 7 m along internal roadways and up to 12 m in the yard. No lighting is proposed along the permanent access road.
- Up to 40 m wide landscape buffer around the proposed converter station will include a range of tree, shrub and wildflower meadow planting to promote biodiversity and provide visual screening.
- Construction phase anticipated to be 24 to 36 months from approximately 2019 to 2022.
- The operational lifetime of the proposed converter station is approximately 40 years, which will likely be extended beyond this following refurbishment and plant replacement.

3.2 Embedded Mitigation

3.2.1 The design process has been iterative throughout. Information derived from ecological surveys and the consultation process has been used, alongside other environmental survey data, to inform the strategic routeing and subsequent design of the proposed converter station location, permanent access road and proposed AC cable and working methods. The final layout, construction design and working methods avoid or (where this is not possible) minimise effects on important ecological features, including designated wildlife sites, habitats of principal importance and habitats associated with protected species.

3.2.2 A range of embedded mitigation measures will be implemented for the duration of the construction phase which will be delivered through the implementation of a Construction Environmental Management Plan (CEMP). The measures relating to ecological features and which ensure compliance with relevant wildlife legislation and good practice are discussed below.

Embedded Habitat Mitigation

3.2.3 Hedgerow, scrub and tree loss will be minimised by marking out and micro-siting construction activities with the ecological clerk of works (EcCOW) prior to works commencing.

3.2.4 During the latter stages of construction, the majority of habitats will be reinstated in-situ to their former condition. This will be delivered by the CEMP.

3.2.5 Grassland replacement would generally match the use of land prior to construction. Appropriate seed mixes will be determined in consultation with the landowners to seek to replicate current conditions.

3.2.6 Replacement hedgerow planting will follow the existing landscape pattern. Hedgerow planting would include five locally appropriate native species (40% hawthorn and 15% each of field maple, hazel, blackthorn and dog rose). Livestock fencing would be provided to safeguard planted specimens.

3.2.7 Where open-cut crossings of watercourses/drains are undertaken, they will be backfilled and the natural channel form reinstated. As only short sections of watercourses/ditches are affected, it is intended that the banks will be allowed to re-colonise naturally, in agreement with stakeholders. If bank and soil stabilisation is required, this will be provided by the use of geotextile or coir matting.

3.2.8 Replacement planting would take time to establish. This assessment is based on 1-3 years for grassland, 2-4 years for new aquatic vegetation, 3-5 years for hedgerows and 15 years for trees, depending on the species and age-class planted. It is recognised that this describes the time for the sward, whips or standards to establish, but longer periods would be required to allow semi-mature trees or hedgerows (e.g. those over 3 m high) to develop i.e. over 5 years for tall hedgerows. These timeframes for planting to establish broadly correspond to the timescales and feasibility for creation/restoration as set out in the national offsetting guidance (Ref 21-29).

3.2.9 Vegetation growth at 15 years (against which residual effects are determined) assumes hedgerow planting has reached a height of 1.5 m, understorey shrub planting at 4-6 m and native tree planting 7-10 m (depending on maintenance).

3.2.10 Management will be provided over a 15 year period to ensure reinstatement planting takes place and habitats establish as intended.

Embedded Badger Mitigation

3.2.11 Surveys identified multiple badger setts in the base scheme design area and surrounding land. The base scheme design has been developed to avoid direct impacts on badger setts where possible. This has been achieved with the strategic routeing and subsequent design of the proposed converter station location, permanent access road and proposed AC cable along with the pinching of the LoD at key locations in close proximity to setts. Priority has been given to retention of main badger setts which are deemed to be the most important sett type for each local badger clan.

3.2.12 Changes made to the route of the permanent access road during the design stage allowed the retention of the main sett (Sett 108), with no works encroaching within 35 m of the sett entrances. Similarly outliers setts in proximity will also not be directly affected by the proposals, with the closest construction activities taking place well over 160 m away from S107.

3.3 Legal Compliance and Good Practice during Construction

3.3.1 A range of measures to ensure legal compliance will be implemented for the duration of the construction phase, which will be delivered through the implementation of a Construction

Environmental Management Plan (CEMP). The measures relating to ecological features and which ensure compliance with relevant wildlife legislation and good practice are discussed below.

Pollution Prevention

3.3.2 The CEMP will include measures to ensure that site run-off and potential pollution events will be prevented from entering the surrounding drainage network and South Forty Foot Drain LWS in line with Environment Agency pollution prevention guidance notes and a range of good practice working methods. This will be achieved through the use of bunds to catch and divert runoff, drip trays to prevent any oil and fuel spillages spreading and the avoidance of storage of any materials in close proximity. Windblown dust will be minimised by using wheel washing and damping down, while net fencing will catch windblown rubbish. To address the risk of singular accidental events, mitigation measures include provision of spill kits and emergency response procedures. Pollution prevention measures will also include minimising air pollution from plant emissions, including turning engines off when not in use. These measures will be effective upon commencement of construction.

Tree Protection

3.3.3 Appropriate tree protection measures will be implemented for the retained woodland trees associated with the permanent access road and trees and hedgerows associated with the proposed AC cable route and will be included in an Arboricultural Method Statement appended to the CEMP. These measures will accord with current standards (BS5837:2012 Trees in relation to design, demolition and construction – Recommendations (Ref 21-30)). All tree and hedgerow works will comply with BS3998:2010 'Tree Work – Recommendations' (Ref 21-31). These measures will minimise incidental damage and disturbance to the habitats and the species they support.

3.3.4 To restrict spread of tree pathogens, all equipment and machinery and vehicles used for tree, hedge and shrub removal will be cleaned, disinfected and used in accordance with current Forestry Commission biosecurity guidance and the EcCOW will advise on whether each working area requires 'red' or 'amber' level biosecurity precautions.

3.3.5 These measures will be effective upon commencement of construction.

Reptile Legal Compliance

3.3.6 As there is the potential for reptiles to be present within some areas of the proposed converter station site, permanent access road and proposed AC cable route, Reasonable Avoidance Measures (RAMs) will be implemented during site clearance works to ensure no killing or injury to individual reptiles. RAMs will be delivered through the production of a method statement appended to the CEMP and will comprise staged vegetation removal. Initial strimming of vegetation to 300 mm followed by a later second cut to 150 mm and with both cuts proceeding in

one direction will allow not only reptiles, but also amphibians and small mammals to vacate the affected area. The areas will be left for a period of 24 hours after the first and second cuts, after each of which the EcCOW will undertake a hand search to confirm the absence of amphibians and reptiles. Following the second cut and hand search, vegetation will be strimmed to ground level, at which point full site clearance and levelling will then be undertaken. Any animals found during hand searching will be removed to alternative suitable habitat by the EcCOW. Site clearance affecting suitable amphibian/reptile hibernation features (identified by the EcCOW) will avoid the hibernation period (November to early March inclusive).

3.3.7 In order to prevent reptiles using subsoil and topsoil piles for refuge or hibernation, the surfaces of the piles will be tamped down and consolidated to ensure individuals cannot access them. In addition, stored materials which could be used for refuge or hibernation by reptiles will be stored off the ground on pallets to prevent their access and reduce risk of harm during collection or deposition of materials.

3.3.8 As mentioned in the first paragraph of this section on reptile legal compliance, the measures put in place will also serve to prevent killing or injury to other fauna, in particular amphibians and hedgehogs. These RAMs can therefore provide a multiple function and be implemented for this wider range of fauna.

3.3.9 These measures will be effective upon commencement of construction.

GCN Legal Compliance

3.3.10 Construction of the northern part of the proposed AC cable route within 500 m of the assumed small GCN population within Pond P175 and Ditch D611 (within Bicker Fen Substation), has the potential to lead to killing and injury of individuals where suitable habitats such as hedgerows, ditches, tall grassland and plantation woodland may be temporarily disturbed.

3.3.11 Given the assumed small size class of the GCN population present and the temporary nature of potential impacts, it is currently proposed that a NE licence be obtained to undertake works within Bicker Fen Substation. An updated survey will be undertaken prior to submission of the licence to confirm population size. The licenced works will comprise one-way fencing of the working area and placement of refugia which will be checked regularly for a minimum of 30 days, with any GCN found, being removed to alternative suitable habitat near Pond P175 by the EcCOW. Following this exclusion period, the working area will be subject to staged strimming of vegetation and hand searching prior to the commencement of construction.

3.3.12 Amphibian exclusion fencing will be of a specification and shall be installed and removed in accordance with current mitigation guidelines (21-6). The installation of the fencing will be supervised by a licensed ecologist and will be installed and removed during the months February to October inclusive, provided weather and ground conditions are suitable. On completion of installation of the AC cable route, exclusion fencing and refugia will be removed by or under the supervision of a licensed ecologist. If construction works are completed during the winter, the exclusion fencing will be retained in place until the next appropriate seasonal window.

3.3.13 Prior to the beginning of construction works a tool box talk will be provided by a licensed ecologist detailing the conditions of the licence and emphasising the legal implications of the related Method Statement. A Duty of Care document will be produced to inform site contractors of obligations to maintain fencing throughout development. The toolbox talk will include advice on distinguishing great crested newts from other amphibians and identification guides will be provided on site for reference. Site workers will be advised to remain vigilant for GCN and if they think they have identified one within the site it should be left undisturbed on discovery and the EcCOW contacted immediately.

3.3.14 A site representative will be trained by the EcCOW to inspect the fencing for damage. Inspections will occur daily during the construction period in times of amphibian activity (February to October inclusive) and at least fortnightly during winter periods (November to January inclusive). All minor damage to perimeter exclusion fences will be replaced on the same day that the damage is discovered by the site representative. Any substantial damage, requiring disturbance of the fence membrane at ground level (i.e. any works such as removal, reinstatement or replacement of fence membrane) shall be reported to the licensed ecologist on the morning of discovery. Ideally, remedial measures will be implemented on the same day, or at least within 24 hours of the damage occurring, supervised as appropriate by a licensed ecologist. A record of fence checks and repairs will be kept on site with a copy of the NE licence. A copy of the GCN licence will be retained on site.

3.3.15 Smaller excavations within the proposed converter station site and along the proposed AC cable route and permanent access road will be covered overnight to prevent entrapment of any amphibians. If any open excavations are left uncovered these will be inspected by the EcCOW at the start of each working day to ensure no individuals are present, and to remove any that are trapped to a safe location, before works commence.

3.3.16 Should dewatering be required prior to the installation of temporary culverts, rescue of GCN and other amphibians will be undertaken during dewatering. Filters will be placed on pumps to prevent entrapment of individuals. Any animals found during the rescue will be removed to alternative suitable habitat by the EcCOW.

3.3.17 Reinstatement of habitats will ensure that functionality and connectivity within the wider landscape is maintained. The existing pond and ditches within Bicker Fen Substation will be enhanced through a programme of vegetation clearance to create more open water to maintain the existing GCN population and provide improved habitat for breeding.

3.3.18 These measures will be effective upon commencement of construction.

Reasonable Avoidance Measures for Other Amphibians

3.3.19 The measures described above for reptile and GCN legal compliance will also apply to other amphibians.

3.3.20 These measures will be effective upon commencement of construction.

Bat Legal Compliance

3.3.21 As a precaution, prior to site clearance, pre-construction surveys of all trees affected by the proposals, including enabling works, and which are identified to have moderate or high bat roost potential will be undertaken. These surveys will comprise tree climbing inspections (providing the tree is safe to climb) and, if required, nocturnal surveys at the appropriate time of year. This will be carried out in advance of the works, allowing sufficient time for NE licences to be secured should roosts be identified in trees that require felling. If any additional roosts are identified, the proposed works will be reviewed to see if any adjustments can be made to avoid the roost site(s). This is best practice and, furthermore, the licensing process requires consideration as to whether there are any satisfactory alternatives that would result in a lesser harm. If roost compensation is required, this will most likely be appropriate by means of the provision of bat boxes.

3.3.22 The need for construction phase lighting is minimal. However, where necessary, lighting will be directed away from trees, hedgerows, woodland and watercourses to avoid the possibility of deterring bat activity. Lighting will comprise trailer mounted masts with generator sets and will be directional.

3.3.23 Losses of bat important foraging and commuting habitat across the base scheme area are relatively small. Exceptions include hedge removal which may have a temporary fragmentation effect on bats. As detailed in the embedded habitat mitigation text, replacement hedgerow planting will be undertaken in the first planting season following completion of construction and general ground reinstatement. Fragmentation effects i.e. potential abandonment of a commuting route, can occur when gaps in excess of 10 m are present in a formerly intact feature for common bat species. Therefore, where hedgerow removal exceeds 10 m, temporary fencing will be placed across hedgerow gaps each night when bats are likely to be active (April to October) and will be installed during reinstatement to provide continuity of the feature until hedgerow planting is established (approximately 3 to 5 years).

Water Vole and Otter Legal Compliance

3.3.24 During the course of water vole and otter surveys completed to date, no evidence of otter has been confirmed in the survey area. Water vole has only been confirmed present at pond P175 within the Bicker Fen Substation. One further survey visit will be undertaken in August 2017.

3.3.25 Water vole home ranges expand and contract within and between years and otter home ranges are very large and may use watercourses and waterbodies at low levels (on passage) without obvious field signs and therefore their distribution may change before construction activities commence. Therefore a pre-commencement water vole and otter survey will be carried out (between mid-April and September) at all watercourses/drains to be crossed, to update the existing baseline. Surveys will be sufficiently advanced of works to allow any mitigation or licensing requirements to be implemented. If either species has colonised the site and avoidance of impacts is not possible, NE will be contacted to agree a way forward in line with guidance current at the time.

3.3.26 Where no water vole burrows are identified during the pre-commencement survey, vegetation control will be undertaken to dissuade water voles from colonising the working area prior to commencement. Vegetation within the ditch and on both banks will be strimmed to bare ground, at least to the top of the bank, and where tall vegetation extends beyond this point, up to 5 m from the top of the bank. Within the ditch, strimming will extend 5 m up and downstream from the working area. Arisings will be removed from the cleared area and stored more than 5 m from the top of the ditch banks.

3.3.27 Vegetation within the working area will be regularly strimmed to ensure that water voles are dissuaded from colonising the working area.

3.3.28 Any excavations adjacent to watercourses that cannot be boarded or fenced overnight will have ramps installed (with a maximum 40° slope) to allow any otter inadvertently gaining access to the excavation to exit safely.

3.3.29 With respect to the water vole population within pond P175, the boundary of the LoD is 5 m from the pond. The recommended buffer zone around ponds in order to protect burrows is generally in the region of 3-5 m from the toe of the bank i.e. at and immediately above water level (Ref 21-11 Dean et al, 2016). However, vegetation clearance within the LoD prior to construction will be undertaken in line with methods described for reptile and GCN legal compliance above. The need for a Class Licence to undertake this work for water voles will be confirmed with NE.

3.3.30 These measures will be effective upon commencement of construction.

Badger Legal Compliance

3.3.31 Eight setts fall within either the proposed converter station, permanent access road or proposed AC cable route or within the 30 m buffer. As discussed in Embedded Badger Mitigation above, one main sett S108, has been avoided during the design process.

3.3.32 All construction works within 30 m of a known active badger sett will be carried out under a Natural England licence. This includes the closure of six setts (S109, S115, S116, S117, S118 & S135) and supervision of works within 10 – 30 m of one sett (S105).

3.3.33 The acceptable working distance from a badger sett can only be assessed on a case-by-case basis and is dependent on the extent and type of the proposed works. Destruction of a badger sett will only be undertaken as a last resort. In most cases the badger sett will be protected from disturbance and potential damage by an exclusion zone marked out in advance of construction works commencing.

3.3.34 On the basis of current evidence, no main sett will be permanently or temporarily lost as a result of the development and therefore no artificial sett construction is proposed. However, badgers can frequently alter the dynamics of sett occupation and thus the status of setts may change within or between years. In the unlikely event that a replacement sett is required, the construction of an artificial sett would be completed six months prior to the start of works to close the existing main sett.

3.3.35 Closure or disturbance of a badger sett can only be implemented between 1st July and 30th November, inclusive, to avoid the period when badgers are likely to be breeding and therefore more susceptible to disturbance. Pre-construction surveys will be undertaken to determine the presence of any setts that may have been constructed and any changes in extent or level of use during the interim period since surveys were completed. If site conditions change and avoidance is not possible the NE licence will be updated to include these changes with appropriate mitigation applied.

3.3.36 To exclude badgers from the affected setts, badger gates will be installed over each entrance and the sett. An establishment period of up to 7 days during which the gates will permit exit and entry will allow badgers to acclimatise to the gates. If appropriate, wire mesh will be installed across the sett area in conjunction with the gates to prevent alternative entrances being dug. The gates will then be set to exclude badgers and the sett will be then subject to a 21 day exclusion period. If at any point during the 21 day exclusion period a breach is apparent, repairs to the exclusion measures will be made and the 21 day monitoring period re-initiated. Once it is confirmed no badgers are present within a sett, the sett will be carefully excavated under the supervision of the licence holder. Destruction will be undertaken with a JCB or similar, commencing at approximately 30 m from the outer sett entrances and working towards the centre of the setts, cutting 0.5 m slices in a trench to a depth of 2 m. This will be carried out in such as manner to ensure that top soil and sub soil are not mixed. Exposed tunnels will be checked for recent badger activity. The sett will be destroyed from several directions, in the above manner, until only the central core of the sett remains. Once it is ensured that no badgers remain, the core will also be destroyed and the entire area back-filled and made safe. Sett excavations should be concluded within one working day, as badgers may re-enter exposed tunnels and entrances.

3.3.37 Two-way badger gates will be installed within demarcation fencing along the proposed AC cable route and permanent access route where well used badger paths are severed in order to prevent fragmentation of the badger clan's home range.

3.3.38 Trenches or excavations near badger setts will not be left open overnight and will either be boarded or fenced off at the end of each day or egress ramps will be provided.

3.3.39 Excavated soil will be stored in an area agreed with the EcCOW and will not obstruct existing badger paths or interfere with any active setts by preventing access or egress.

3.3.40 Two-way badger gates will be installed within the stock proof fencing used to demarcate the permanent access road and proposed AC cable route at main badger path crossing points and at other suitable intervals, to allow movement of badgers across the landscape. Warning signs will be installed to highlight the presence of a badger crossing point.

3.3.41 These measures will be effective upon commencement of construction

Breeding Bird Legal Compliance

3.3.42 Any tree and scrub vegetation removal, or tall ruderal vegetation removal or any works affecting tall marginal vegetation of watercourses will take place outside the bird nesting season (avoiding

the period March to August inclusive). Where these measures are not possible and works need to be carried out during the bird breeding season, all areas to be affected will be checked for evidence of nesting birds a maximum of 24 hrs prior to the vegetation removal/tree felling works taking place. If any active bird nests are discovered these will be given a minimum standoff of 5 m (this may increase depending on species, proposed works and location) within which no potentially disturbing works will take place until the young have fledged and the nest vacated. A second nesting bird check will then be undertaken to ensure the tree/vegetation does not contain any further active nests prior to felling/removal works taking place.

3.3.43 Retained trees and scrub adjacent to working areas will be protected from encroaching traffic using fencing (BS5837:2012) (Ref 21-30), this will minimise disturbance to nesting birds in retained habitat.

3.3.44 Any works affecting previously undisturbed areas of open fields (including any storage of materials, clearance of vegetation, or groundworks) carried out during the breeding bird season (March to August inclusive) will require a nesting bird check immediately prior to the works to ensure that there are no ground nesting birds present in the affected area. If active bird nests are located, the nest will be marked and all potentially disturbing works within at least 20 m of the nest location will be delayed until the active nest had been vacated. Prior to works in the area commencing a further nesting bird survey will be required to establish that no active bird nests were present within the area.

3.3.45 Impacts on birds nesting opportunistically in working areas will be minimised by the EcCOW checking any sections of bare ground of more than 0.5 ha for active bird nests, if these areas have been left undisturbed (more than 50 m from an active working area) for more than 1 week during the breeding season. If nesting birds are found, measures appropriate to the species, location and proposed works will be implemented as advised by the EcCOW to ensure nests are not destroyed or disturbed while active.

3.3.46 These measures will be effective upon commencement of construction.

CEMP

3.3.47 The CEMP is the delivery document for all ecological mitigation; it describes measures applicable to all construction activities:

- pre-construction surveys will be carried out to ensure baseline data remains up to date;
- an appropriately qualified EcCOW will be appointed. The role of the EcCOW is set out in the CEMP and the appointed person(s) would be a member of the Chartered Institute of Ecology and Environmental Management or hold equivalent accreditation;
- there will be a demarcation of the working areas (including storage areas and accesses), using appropriate fencing, to protect retained habitats and features;
- traps or wildlife exclusion fencing will be installed (and maintained), as required by protected species licences;

- clearance of trees, hedges, grassland and other habitats will take place under supervision and at the appropriate time of year, as appropriate to the site/species in question; and
- there will be prompt reinstatement of habitats to their former condition, including any measures to enhance species diversity.

3.3.48 The CEMP will include:

- Procedures for designated sites affected by the Proposed Development;
- General Method Statements for habitat protection;
- Species-specific Method Statements, addressing protected S41 species; and
- Provisions within the High Level Tree Assessment (including felling, pruning, pollarding, replacement tree and hedgerow planting, and use of protective fencing and root protection zones in accordance with BS5837:2012 (Ref 21-30)); and
- The approach to post-construction monitoring relating to reinstatement and mitigation activity including triggers for and details of appropriate remedial action.

4 Planning Policy and Legislative Considerations

4.1 Introduction

4.1.1 This section sets out the legislative and policy framework within which sites, habitats and species which have been identified by government and conservation organisations as the key focus for biodiversity conservation in the UK and which therefore are the focus of ecological assessment with respect to proposed developments.

4.2 Legislation

4.2.1 The key legislation relating to ecology and development which helps define what ecological features require consideration are summarised as follows:

- Conservation of Habitats and Species Regulations 2010 (as amended) (Ref 21-32) – conveys protection to select species (European Protected species (EPS)) and to the habitats on which they rely to complete their lifecycle e.g. great crested newts, bats, otter.
- Wildlife & Countryside Act 1981 (as amended) (Ref 21-8) – provides a national level of protection to specific animals and plants and controls the release of non-native species e.g. water vole, common reptiles, all breeding birds.
- Countryside & Rights of Way Act 2000 (Ref 21-33) – extends the protection of certain species from reckless as well as intentional acts. Part III requires that government departments have regard for the conservation of biodiversity, something that is extended by the NERC Act 2006.
- Natural Environment and Rural Communities (NERC) Act 2006 (Ref 21-6) – requires planning authorities and statutory undertakers to consider impacts on "habitats and species of principal importance for the conservation of biodiversity". S41 (S41) lists habitats e.g. coastal and floodplain grazing marsh and species e.g. skylark of principal importance, which are to be considered, irrespective of whether they are covered by other legislation. The S41 list was originally taken forward under the UK BAP (first published 1994) (Ref 21-34) but is now prioritised under the Biodiversity 2020 Strategy (Ref 21-35).
- Hedgerows Regulations 1997 (Ref 21-7) – protection of 'important' hedgerows from being uprooted or destroyed. Importance is determined based on adjacent land use, age, historic value and ecological value (specific criteria are set out).
- Protection of Badgers Act 1992 (Ref 21-36) – protection of badgers and their setts from killing, injury and certain acts of cruelty. Protection of setts from damage, obstruction or destruction.

4.3 National Policy

4.3.1 With respect to national policy, the key guidance is provided by The National Planning Policy Framework (2012) (NPPF) (Ref 21-25) Chapter 11: Conserving and Enhancing the Natural Environment (paragraphs 109 – 125) identifies the importance the Government places on development enhancing the natural environment by protecting and enhancing valued landscapes, geological conservation interests and soils. It recognises the wider benefits of ecosystems beyond their inherent value to wildlife. The NPPF emphasises the hierarchy of designations, the mitigation hierarchy and the principle that new development should result in no net loss of biodiversity.

4.3.2 Other national policy which supports the NPPF include: Circular 06/2005: Biodiversity and Geological Conservation (Ref 21-37); Making Space for Nature (Ref 21-38); The Natural Environment White Paper (Ref 21-39) and Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Ref 21-35).

4.3.3 The National Policy Statement for Energy (EN-1) (Ref 21-40) states that energy infrastructure projects must consider the potential for effects on European sites under the Habitat Regulations and that their Environmental Statements (ES) must clearly assess the effects of the project on all levels of designated site, on protected species and habitats and on habitats and species identified as being of principal importance for the conservation of biodiversity. It recognises that there are many opportunities for building beneficial biodiversity as part of good project design in and around developments. Appropriate mitigation must also be included in the ES which reduces or avoids impacts where possible and restores and enhances biodiversity where practicable.

4.3.4 The National Policy Statement for Electricity Networks Infrastructure (EN5) (Ref 21-41) refers back to the general principles relating to biodiversity presented in EN1.

4.4 Local Policy

4.4.1 Local planning policy of relevance to nature conservation generally seeks to avoid effects on designated sites and protected habitats and species, whilst also seeking to ensure maintenance and creation of wildlife networks and no net loss of biodiversity. Local policies of relevance to the base scheme design and its effects are listed below:

Boston Borough Council

- Boston Borough Local Plan, Adopted 1999 (Saved Policies, 2007) (Ref 21-42) (BBLP)
  - Policy R5 (Witham Way Footpath and Nature Reserve)
  - Policy G2 (Wildlife and Landscape Resources)
  - Policy G4 (Safeguarding the Water Environment)
- South East Lincolnshire Local Plan 2011-2036 (Publication Version, 2017) (Ref 21-43) (SELLP)
  - Policy 24 (The Natural Environment)
  - Policy 27 (Climate change and Renewable and Low Carbon Energy)

South Holland District Council

- South Holland Local Plan 2006 (Saved Policies, 2009) (Ref 21-44) (SHLP)
  - Policy E1NA (Development and Sites of Local Biodiversity Interest)

4.5 Action Plans and Other Guidance

4.5.1 Additional guidance on habitats and species to be considered within the ecological assessment is provided by:

- The Lincolnshire Biodiversity Action Plan (BAP) 2011-2020 (Ref 21-2), which is delivered through the Lincolnshire Biodiversity Partnership. This focuses on aspects of the local ecology which are in need of protection or conservation. The habitat action plans of general relevance to proposed converter station, permanent access road and AC cable route include habitats within each of the overarching themes of farmland and grassland, rivers and wetlands and trees and woodland. Species action plans of relevance include those for bats, farmland birds, freshwater fish, newts, water vole, greater water parsnip and invasive non-native species (see Appendix 21.1 for full details).
- Black Sluice Internal Drainage Board (IDB), who are responsible for management of water levels and flood risk in the area of the proposed converter station, permanent access road and AC cable route, also have their own BAP (Ref 21-1) which includes the broad habitats and species listed above and also European eel, otter, barn owl and grass snake.
- The Birds of Conservation Concern (BoCC) report (Ref: 21-19), which splits UK birds into three categories of conservation importance – red, amber and green. Red is the highest conservation priority, and includes species that are globally threatened, or have experienced historical UK population decline, a severe decline in UK breeding population, or a severe contraction of UK breeding range. Amber is the next most critical group, followed by green.

5 Baseline Conditions

5.1 Designated Wildlife Sites and Notable Habitats

5.1.1 The locations of designated wildlife sites and notable habitats are illustrated in Figure 21.2 and described below. Full details are presented in Appendix 21.1.

5.1.2 No internationally designated sites are present within 10 km of the proposed converter station, permanent access road or proposed AC route. The nearest sites are The Wash SSSI/SPA/Ramsar site and The Wash and North Norfolk Coast SSSI/SAC which are approximately 13.4 km to the east of the base scheme design.

5.1.3 No nationally designated sites are present within 2 km of the proposed converter station, permanent access road or proposed AC route. In addition, no SSSI Impact Risk Zones coincide with any part of the base scheme design. The nearest nationally designated site is Horbling Fen SSSI which is approximately 3.3 km to the south west.

5.1.4 One non-statutory designated site is present within 1 km of the proposed converter station, permanent access road and proposed AC route. This is South Forty Foot Drain (South Holland End) LWS, located approximately 0.7 km west of the proposed converter station at its nearest point. The LWS is a 15.5 km stretch of a major watercourse which totals 33 km in length. The manmade watercourse and its bankside habitats are an important wildlife corridor and habitat resource in a landscape dominated by wildlife-poor arable fields. The banks support grassland and variable amounts of scrub, diverse populations of aquatic plants have been recorded within the channel and the site is thought likely to be of value for breeding and wintering bird species and aquatic invertebrates. This site is taken forward as an important ecological receptor at the County level.

5.1.5 One parcel of S41 habitat Coastal and Floodplain Grazing Marsh (identified in Natural England's Priority Habitat Inventory data set held on the MAGIC interactive mapping portal), is crossed by the proposed AC route (Figure 21.2). Additional information obtained from GLNP indicates that there is a low confidence in the interpretation of this data, which is often obtained from Higher Level Stewardship (HLS) schemes. Furthermore, the Phase 1 habitat survey indicated that this land parcel was heavily grazed with a short sward and would be unlikely to support species associated with the Coastal and Floodplain Grazing Marsh priority habitat. For this reason, this feature is not taken forward as an important ecological feature.

5.1.6 Additional S41 habitats present within 1 km include coastal and floodplain grazing marsh (three separate areas of fields around Bicker Fen) and small pockets of broad-leaved woodland (in the east, at Northorpe and Donington).

5.2 Habitats and Flora

5.2.1 No records of protected or notable flora were returned within 1 km of the proposed converter station site, permanent access road or proposed AC route.

5.2.2 The proposed converter station site, permanent access road and proposed AC route predominantly comprise arable farmland dissected by drains of varying sizes which are intensely managed. No protected or invasive species of plant were recorded during the surveys.

5.2.3 The habitats recorded within the base scheme design include:

- Arable (137.50 ha);
- Modified neutral grassland[1] (8.78 ha);
- Poor semi-improved grassland (8.13 ha);
- Improved grassland (0.08 ha);
- Tall ruderal herbs (0.29 ha);
- Standing water (wet ditches) (2862.09 m);
- Dry ditch (3189.43 m);
- Broadleaved trees (accurate measure not possible);
- Plantation broadleaved woodland (1.92 ha);
- Species-poor intact hedgerow (1809.42 m);
- Scattered scrub (accurate measure not possible);
- Swamp (0.17 ha);
- Buildings (0.01 ha);
- Hard standing (5.78 ha).

5.2.4 Full details of the habitat survey results are provided in Appendix 21.2 with supporting plans provided in Figures 21.3 and photographs of representative habitats shown in Figure 21.4. In line with CIEEM EcIA guidance (2016) (Ref 21-24), detailed assessment of ecological features that are '*widespread, unthreatened and resilient to project impacts'* is not necessary. The majority of the habitats within the base scheme design fall into this category. Only those habitats with inherent botanical value are taken forward as important ecological features are described in the following paragraphs. To avoid repetition, any impacts on fauna predicted as a result of the loss, degradation or fragmentation of habitats which do not in themselves have inherent value are described in the relevant faunal sections.

[1] The neutral grassland categories detailed within the Phase 1 Habitat Survey Handbook are concentrated on grassland associated with rural situations (pastures and meadows), as such it was agreed with JNCC in 2005 (P. Gateley, pers. comm.) that neutral grassland habitats that don't easily fit within these categories, usually within urban or industrial areas, can be referred to as modified neutral grassland –

'*Modified neutral grassland is not derived from agricultural grassland and the terms semi-improved and improved do not apply. Some modified neutral grassland may be species-rich but many swards are dense, coarse and species-poor. Modified neutral grassland naturally regenerates on disturbed ground and is unmanaged. It most commonly occurs in urban areas and on post-industrial land*'.

Hedgerows

5.2.5 The proposed converter station site and permanent access road do not contain any hedgerow habitats.

5.2.6 Six species-poor hedgerows are present along the proposed AC cable route comprising field boundaries. One species-poor hedgerow is present on the eastern side of the A52 opposite the junction with the permanent access road. The majority of hedgerows are well established and unmanaged. The species-poor hedgerows in this area are dominated by hawthorn *Crataegus monogyna*.

5.2.7 All hedgerows along the proposed AC cable route consist of native woody species and qualify as S41 habitats of principal importance. Hedgerows are included as action plan habitats in the Lincolnshire BAP (Ref 21-2) and Black Sluice IDB BAP (Ref 21-1). They do not qualify as important with respect to the Hedgerow Regulations 1997 (Ref 21-7) wildlife and landscape criteria, but are likely to have a supporting function to protected species such as amphibians, birds and foraging bats. Due to rarity within the area, the hedgerow network along the proposed AC cable route is an important ecological feature at the Local level.

Woodland and Trees

5.2.8 Tree cover is sparse within the open arable landscape. Small areas of broad-leaved plantation woodland are present as part of the landscape screening planting within Bicker Fen Substation where the proposed AC cable route will terminate, and one area is present along the permanent access road.

5.2.9 The broad-leaved plantation woodland habitats within Bicker Fen Substation comprise English oak *Quercus robur*, silver birch *Betula pendula* and dogwood *Cornus sanguinea* with alder *Alnus glutinosa*, hazel *Corylus avellana* and hawthorn being locally dominant. These trees appear to have been planted in the last 10 years or so as part of the screening for the substation. A number of individual trees along the north eastern boundary appear to be more mature and are possibly part of an older linear feature, but these have also been incorporated within the plantation.

5.2.10 The small area of broad-leaved plantation woodland along the permanent access road was noted as being between 15 and 20 years old and comprised frequent hornbeam *Carpinus betulus* and rowan *Sorbus aucuparia*, with occasional field maple, dogwood, spindle *Euonymus europaeus* and ash *Fraxinus excelsior.*

5.2.11 No significant woodland ground flora species and no WCA8 (Ref 21-8) protected plant species such as bluebell *Hyacinthoides non-scripta* were identified within any of the woodlands.

5.2.12 These woodlands are too small and recently planted to qualify as NERC Act 2006 (Ref 21-6) S41 woodland habitat or priority habitat within the Lincolnshire BAP, but do still have inherent value due to the rarity of woodland within the local landscape.

5.2.13 Scattered broad-leaved trees are infrequent across the base scheme design area with only one individual mature tree, a white willow *Salix alba*, present along the AC route and 17 immature trees along the permanent access road at its junction with the A52. Trees associated with hedgerows are included as with the hedgerow as priority habitat within the Lincolnshire BAP (Ref 21-2). Lincolnshire County Council's online mapping system indicates that no trees on or immediately adjacent to the base scheme design are subject to Tree Preservation Orders.

5.2.14 Taken as a whole and due to their rarity within the area, the woodland and tree stock is taken forward in this assessment as an important ecological feature at the Local level.

Watercourses

5.2.15 Twenty two watercourses are present surrounding the proposed converter station site or crossed by the permanent access road or proposed AC cable route. These watercourses are all manmade and vary from significant wet drains (Hammond Beck) to individual field ditches some of which are wet, some dry and some variable. The majority of the drains across the study area were not recorded to have a significant flow although significant drains such as Hammond Beck appeared to have a slow flow.

5.2.16 The aquatic component of the wet ditches supported a variety of marginal and emergent plant species including common reed *Phragmites australis,* lesser pond-sedge *Carex acutiformis* and fool's watercress *Apium nodiflorum.*

5.2.17 The banks of the ditches typically supported terrestrial plant species of coarse grassland such as false oat-grass *Arrhenatherum elatius,* cock's foot *Dactylis glomerata* and cow parsley *Anthriscus sylvestris*. Herb species encountered included nettle *Urtica dioica* and great willowherb *Epilobium hirsutum*. Scrub species often encountered included hawthorn and bramble *Rubus fruticosus agg*..

5.2.18 The NERC Act 2006 (Ref 21-6) S41 river category includes all natural and near-natural running water habitats. The drains within the study area do not meet this qualification and are therefore not assessed to be habitats of principal importance. However, these habitats do qualify as the Lincolnshire BAP (Ref 21-2) habitat 'Rivers, Canals and Drains' and are also included within the Black Sluice IDB BAP (Ref 21-1) 'Drains' category.

5.2.19 On this basis, watercourses are carried forward in the assessment as important ecological features at the Local level.

5.3 Great Crested Newt and other Amphibians

5.3.1 Two records of GCN were returned within 1 km of the base scheme design (Appendix 21.1 and Figure 21.2), these being located within the pond (P175) and a ditch (D611), to the north of the pond, within the Bicker Fen Substation. These records were from surveys conducted in 2015 which recorded a peak count of five individuals in P175 and one individual in D611, indicating a

small population of GCN was present at Bicker Fen Substation at the time of survey. No records of other amphibians were returned within the 1 km study area.

5.3.2 Full details of the GCN survey are presented in Appendix 21.4 and Figure 21.5 with photographs of representative amphibian habitats shown in Figure 21.6.

5.3.3 In addition to the pond located within the Bicker Fen Substation (P175) only one other pond (P192) was located within the study area for the base scheme design (500 m south east of the proposed converter station site and 250 m south of the permanent access road).

5.3.4 The HSI score for both ponds was 'poor'. P192 was therefore scoped out of further survey in accordance with the agreed survey approach, by merit of distance from the based scheme design and the 'poor' HSI score. Despite its 'poor' HSI score, P175 was retained within the scope for further survey due to pre-existing records for GCN and proximity to the base scheme design. However, further survey, although attempted, could not subsequently be undertaken due to the presence of breeding marsh harriers.

5.3.5 A total of 56 ditches were identified within the study area for the base scheme design. Access was not possible to one of these (D703), originally due to lack of access permission and then due to presence of breeding marsh harrier once access permission was obtained. Thirty three ditches had the appearance of being permanently dry or lacking sufficient standing water to function as potential GCN breeding habitat. These were scoped out from further assessment.

5.3.6 Twenty two remaining ditches were subject to DSI assessment. Of these, 14 ditches met the DSI score criteria for presence/absence GCN surveys using eDNA sampling. Three ditches could not be subject to eDNA survey as they were found to have dried out following the DSI survey. Of the remaining 11 potentially suitable ditches, two were originally located over 250 m from the base scheme design and were therefore initially scoped out from further survey. Changes to the base scheme design which brought these two ditches within the survey buffer meant it was not subsequently possible to include these two ditches for further survey within the 2017 GCN breeding season. Therefore nine ditches were subject to eDNA survey in 2017.

5.3.7 Table 21.9 summarises the GCN survey findings.

Table 21.9 Summary of GCN Survey Results

Pond/ Ditch Ref.	Distance from LoD	HSI/DSI Score	Presence/Absence Results	Population Size Class Results
Ditches				
611	0-50 m	3	Inconclusive	Small (based on pre-existing records)
619	0-50 m	5	n/a (eDNA now required, but previously outside 250m buffer)	n/a (traditional survey possible if presence confirmed, but previously outside 250m buffer)
622	0-50 m	3	Absent	n/a

Table 21.9 Summary of GCN Survey Results				
Pond/ Ditch Ref.	**Distance from LoD**	**HSI/DSI Score**	**Presence/Absence Results**	**Population Size Class Results**
629	0-50 m	3	Absent	n/a
630	0-50 m	5	n/a (dried out)	n/a
632	0-50 m	5	Absent	n/a
646	0-50 m	5	n/a (eDNA now required, but previously outside 250m buffer)	n/a (traditional survey possible if presence confirmed, but previously outside 250m buffer)
679	51-250 m	3	Absent	n/a
681	0-50 m	5	Absent	n/a
692	0-50 m	3	Absent	n/a
693	0-50 m	2	n/a (dried out)	n/a
700	0-50 m	5	Absent	n/a
709	0-50 m	1	n/a (dried out)	n/a
716	0-50 m	1	Absent	n/a
Ponds				
P175	0-50 m	0.36	Could not be surveyed due to breeding marsh harriers	Small (based on pre-existing records)
P192	51-250 m	0.44	Scoped out ('poor' HSI)	n/a

5.3.8 The nine ditches which were assessed as providing suitable GCN breeding habitat, returned eight 'negative' results confirming absence of GCN and one 'inconclusive' result where GCN have been recorded in 2015 (Table 21.9). No further survey for GCN is required at ditches D622, D629, D632, D679, D681, D692, D700 or D716. Pond P175 and Ditch D611, for which pre-existing records indicate a small GCN population is present, could not be subject to further survey. Pond P175 supported breeding marsh harriers and further survey risked disturbance, while permission to access Ditch D611 to conduct surveys was not granted early enough within the appropriate GCN survey season (mid-April to June) to allow for traditional surveys after the return of an 'inconclusive' eDNA sampling result. The desktop records date from 2015 and it is therefore considered that these records remain pertinent.

5.3.9 One ditch (D716) was subject to traditional survey for one visit, until a 'negative' eDNA result for GCN was confirmed at which point traditional survey effort was ceased. An adult small newt was identified within the ditch during this survey visit. One common toad and one common frog were recorded at the proposed converter station site during the reptile survey in September 2016 (Appendix 21.10 and Figure 21.13).

5.3.10 Newts are included as a priority species group within the Lincolnshire and Black Sluice IDB BAPs (Ref 21-2, Ref 21-1). Due to the presence of an assumed small population of GCN within the Bicker Fen Substation, identified through pre-existing records, and the presence of small newt species, common toad (a S41 species (Ref 21-6)) and common frog recorded during field surveys, the amphibian assemblage is taken forward as an important ecological feature within the Local context.

5.4 Bats

5.4.1 Records of bats returned within 1 km of the proposed converter station, permanent access road and AC cable route include brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, pipistrelle *Pipistrellus* species and bat species (Appendix 21.1 and Figure 21.2). Several of these records relate to roosts of bat species, common pipistrelle or brown long-eared bat; one at Northorpe and several in Donington. None of these would be directly affected by the base scheme design.

5.4.2 Full details of the bat surveys are provided in Appendix 21.5. Potential roost features are identified in Figure 21.4 and Figures 21.8-21.9 illustrate the activity surveys. Findings of the bat surveys are summarised below.

Roost surveys

Ground Based Assessment

5.4.3 No trees are present within the proposed converter station site, although one tree (T288, an ash) is located within 50 m. This tree was assessed to have low suitability for roosting bats following ground based assessment. This tree will not be affected, directly or indirectly, by construction or operational activities.

5.4.4 A number of young trees are present at the junction of the permanent access road with the A52. These trees do not support any features which could provide potential roosting habitat for bats and they were assessed to have negligible suitability. The permanent access road also crosses the southern end of a small block of broad-leaved plantation woodland. These trees are approximately 15-20 years old. None support any features which could provide suitable bat roosting habitat and they were assessed to have negligible suitability.

5.4.5 Tree T286, a white willow *Salix alba,* is located within the proposed AC cable route on Vicarage Drove adjacent to the eastern boundary of Bicker Fen Substation. This tree was categorised as having moderate bat roost potential due to the presence of small rot holes and broken limbs. Consequently, T286 was taken forward for nocturnal surveys. Young plantation broad-leaved woodland within the Bicker Fen Substation is also within the proposed AC cable route, although these trees are too young to support any features suitable for roosting bats and were assessed to be of negligible suitability.

5.4.6 A small brick built culvert is present in the north east corner of the proposed converter station. It is approximately 1.5 m in height by 1 m in width and in a good state of repair. No bat access points were observed and the culvert was assessed as having negligible bat roost suitability.

5.4.7 A small fenced-off compound is present on the southern boundary of the proposed converter station site. The shelters and containers within the compound did not possess features with the potential to support roosting bats and were assessed as having negligible suitability.

Nocturnal emergence surveys

5.4.8 No bats were recorded emerging from tree T286 during the two nocturnal emergence surveys. Bats, all of which were common pipistrelle, were recorded flying towards the tree and using the habitat around it for foraging.

5.4.9 As a result of the presence of T286 within the proposed AC cable route, potential roost features for bats are taken forward as an ecological receptor, valued at the Local level due to the relative rarity of suitable tree roost habitat in the area.

Activity surveys

5.4.10 The landscape within which the base scheme design is located is dominated by open arable habitats. These habitats are considered unlikely to offer substantial functionality for local bat populations in terms of foraging or commuting. However, boundary features such as the drains and localised features including plantation woodland patches, tree lines and hedgerows do create landscape continuity and will function as foraging habitats. Considering the surrounding open landscape, localised woodland, tree line and hedgerow features are likely to be the main focus of bat foraging activity in the area, offering greater shelter for bats and their invertebrate prey in a greater range of weather conditions.

5.4.11 Data from the activity surveys indicates that the base scheme design is used by at least five species of bat. Common pipstrelle bats are by far the most abundant species recorded, with significantly lower numbers of soprano pipistrelle, brown long-eared, *Myotis* sp. and noctule. Higher levels of bat activity were recorded at the static location on Hammond Beck which was also in close proximity to a house and trees and may not necessarily indicate preferential use of the beck, although this cannot be ruled out. Overall higher levels of bat activity are observed during spring and autumn which suggests a dispersed mobile population of bats migrating through the landscape between winter and summer grounds, primarily via the network of drains and using woodland blocks, tree lines and hedgerows as stepping stones.

5.4.12 Construction of the proposed converter station, permanent access road and proposed AC cable route therefore introduces the potential for habitat fragmentation or isolation and thus disruption of foraging or commuting bats (including those which may roost beyond the targeted survey area).

5.4.13 The following species were recorded on site, which have been categorised by distribution and rarity (Wray, 2010) (Ref 21-45):

5.4.14 Common (Populations over 100,000 in England)

- Common pipistrelle (Locations H3, N4, A and B)
- Soprano pipistrelle (Location H3)
- Brown long-eared (Locations H3, A and B)

5.4.15 Rarer (Populations between 10,000 - 100,000 in England)

- *Myotis* species (including Daubenton's, Natterer's and whiskered/Brandt's/Alcathoe) (Locations H3 and A)
- Big bat species (noctule, serotine and Leisler's) (Location H3, A and B)

5.4.16 There is also a 'Rarest' category, however no bats recorded on the site fall within this category.

5.4.17 As well as being protected species, bats are included as a priority species group within the Lincolnshire and Black Sluice IDB BAPs (Ref 21-2, Ref 21-1). Taking this into account and using the Wray et al (2010) (Ref 21-45) approach to valuing foraging and commuting bats, the site is important at the Local level.

5.5 Water Vole

5.5.1 Two records have been returned within 1 km of the base scheme design. (Appendix 21.1 and Figure 21.2).

5.5.2 Full details of the water vole survey are provided in Appendix 21.6 and findings are illustrated at Figure 21.10. No signs of water vole were recorded during survey of the ditches adjacent to the proposed converter station site in 2016, or during surveys along the permanent access road in May 2017. However, water vole feeding signs were recorded at the pond at Bicker Fen Substation (P175) during a GCN survey in April 2017.

5.5.3 Water voles are protected species and are also included as priority species within the Lincolnshire and Black Sluice IDB BAPs (Ref 21-2, Ref 21-1). Although water voles have only been recorded within Bicker Fen Substation, the potential for their presence in the ditches and drains to be affected by the base scheme design still exists, given that populations expand over the season. Therefore as a precaution, water voles are taken forward as an important ecological feature at the Local level.

5.6 Otter

5.6.1 One pre-existing record from 2010 for absence of otter was identified within 1 km of the base scheme design (Appendix 21.1), originating from the South Forty Foot Drain LWS.

5.6.2 Full details of the otter survey are provided in Appendix 21.6 and illustrated at Figure 21.10. No signs of otter were recorded during survey of the ditches adjacent to the proposed converter station site in 2016 or those along the permanent access road in May 2017. While the ditches

and drains to be affected by the base scheme design may be suitable for otters for foraging and dispersal, they are unsuitable for otters to establish holts.

5.6.3 Although otter is a protected species and is included in the Black Sluice IDB BAP (Ref 21-1), on the basis of current results (lack of positive evidence within survey area and lack of suitable habitats for establishing holts), this species is not be taken forward for assessment.

5.7 Badger

5.7.1 Badger activity is prevalent across the landscape within 1 km of the base scheme design, with records from 1 km grid squares within which the proposed converter station site, permanent access road and AC cable route are located. Ten separate records of badger have been returned within 1 km of the proposed converter station, access road and proposed AC cable route (Appendix 21.1 and Confidential Figure 21.3).

5.7.2 Full details of the badger survey results are provided in Confidential Appendix 21.7 and Confidential Figure 21.11. For reasons of welfare, specific sett locations are not described below.

5.7.3 Eight active badger setts (one main, one annexe and six outlier setts) were identified within the badger survey area and are located within potential influence (30 m) of the base scheme design area. A summary of the sett type and activity levels is provided in Table 21.10.

Table 21.10 Summary of Badger Sett Type and Status

Sett Ref.	Sett Type	Sett Activity
Sett 105	Outlier	Well-used
Sett 108	Main	Well-used
Sett 109	Outlier	Partially active
Sett 115	Outlier	Partially active
Sett 116	Outlier	Well-used
Sett 117	Outlier	Partially active
Sett 118	Outlier	Well-used
Sett 135	Annexe	Well-used

5.7.4 Setts were found predominantly along the top of steep ditch banks with tunnels appearing to travel into adjacent fields away from areas likely to flood. Cover is limited with few hedgerows/scrub present across the survey area, therefore the majority of setts were found in open areas of grassland/arable land. All setts (with the exception of Sett 115) were located on the edge of field boundaries, within the more grassy margins, likely due to the use of large agricultural machinery across the rest of the fields.

5.7.5 Due to the location of the setts identified, the distance between other main setts in the wider area and the location of other field signs such as latrines, it is considered likely that the setts identified all form part of the same badger clan (associated with the Sett 108).

5.7.6 The large expanse of arable land present within the wider area offers moderate foraging opportunities for local badger clans, with a range of readily available food sources in close proximity to setts.

5.7.7 The network of ditch banks through the arable landscape provide dispersal routes and well-used paths are common in areas nearby to all active setts. The deep ditches within the study area are likely to act as obstacles to badger movements, with badger paths often clearly identifiable running alongside ditches with crossing points determined by bridges, culverts or shallower parts of the ditches. Regular foraging routes are therefore likely to be well-used with movement restricted to these suitable crossing points.

5.7.8 Badgers are known to be widespread both throughout the local area and across the UK. For the purposes of this assessment, due to their protected status on the basis of welfare, badgers are taken forward as an important ecological feature at the Local level.

5.8 Winter Birds

5.8.1 No records of winter bird species were returned within 1 km of the proposed converter station, permanent access road and proposed AC cable route (Appendix 21.1 and Figure 21.2).

5.8.2 Full details of the winter bird survey results are provided in Appendix 21.8, Figure 21.12 and Figure 21.13.

5.8.3 During both years winter bird surveys recorded only very low numbers of wader species within 500 m of the converter station, permanent access road or AC cable route. This included 33 curlews recorded on one occasion during the 2014/2015 survey and 17 golden plovers recorded during the 2015/2016 survey. Lapwings were regularly recorded within 500 m of the access road, on the far side of the railway, with a peak count of 80 individuals in 2014. Lapwings were also recorded occasionally in very low numbers within 500 m of the AC cable route.

5.8.4 Wildfowl and other waterbird species were regularly recorded on the South Forty Foot Drain, however this is more than 600 m from the base scheme design and species recorded here would not be affected. The only waterbird species recorded within 500 m of the base scheme design were heron and little egret, recorded occasionally in very low numbers.

5.8.5 The site is approximately 13.4 km from the Wash SPA and Ramsar site, which is the nearest European protected site designated for its wintering waterbirds. It is highly unlikely that the birds recorded within the site are associated with the SPA, and are more likely to be part of a resident wintering population within this area. The habitats within the survey area that may potentially affected by the base scheme design do not comprise supporting habitats for the Wash SPA and Ramsar site.

5.8.6 The fields in the survey area were occasionally used by large or moderate flocks of fieldfare (peak count: 483 individuals), starling (peak count: 400 individuals) and redwing (peak count: 100 individuals).

5.8.7 Both the Lincolnshire and Black Sluice IDB BAPs (Ref 21-2, Ref 21-1) include species such as lapwing and starling in their farmland birds species action plan. Due to the presence of occasional usage of the survey area by small flocks of waders and large to moderate flocks of starling, fieldfare and redwing that use the open fields, the winter bird assemblage is taken forward as an important ecological feature at the Local level.

5.9 Breeding Birds

5.9.1 Breeding bird records within 1 km of the proposed converter station, permanent access road and proposed AC cable route include records of: Schedule 1 species barn owl *Tyto alba*, hobby *Falco subbuteo*, merlin *Falco columbarius*,; Annex 1 species short-eared owl *Asio flammeus*; S41 species grey partridge *Perdix perdix*, house sparrow *Passer domesticus*, lapwing *Vanellus vanellus*, linnet *Linaria cannabina*, reed bunting *Emberiza schoeniclus*, skylark *Alauda arvensis*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, tree sparrow *Passer montanus* and yellowhammer *Emberiza citronella;* and records of BoCC red list species mistle thrush *Turdus viscivorus* (Appendix 21.1 and Figure 21.2).

5.9.2 Full details of the breeding bird survey results are provided in Appendix 21.9 and Figures 21.15-21.17.

5.9.3 During the 2016 breeding bird survey, one Wildlife and Countryside Act 1981 (Ref 21-8) Schedule 1 species and eight NERC Act 2006 (Ref 21-6) S41 and/or red listed BoCC (Ref 21-19) species were recorded within the survey area. Of these, four priority bird species were confirmed as breeding or likely to nest within the survey area, including: linnet (3 pairs), reed bunting (2 pairs), skylark (9 pairs), yellowhammer (1 pair) and yellow wagtail (2 pairs). Reed buntings are likely to nest within the vegetated ditches, yellowhammers at the base of scrub and skylarks and yellow wagtails within the open fields.

5.9.4 The only Schedule 1 species recorded within the survey area was marsh harrier. This species was observed during the 2016 survey flying over the site once and was not recorded as breeding or probably breeding within the survey area. However, confirmed breeding at P175 near Bicker Fen Substation was recorded during spring 2017 (when an attempt was made to carry out a GCN survey at the pond).

5.9.5 During the 2017 breeding bird survey a total of 37 bird species were recorded within the permanent access road study area. Three priority bird species were recorded as likely breeding within 100m of the permanent access road. These included linnet (1 pair), reed bunting (3 pairs) and skylark (6 pairs). It is likely that both linnet and reed bunting could breed within the vegetation in field margins within the proposed works area for the road and as there are no tree lines or hedgerows along the field boundaries skylark may also nest within the works area.

5.9.6 No species listed under Schedule 1 of the Wildlife and Countryside Act (Ref 21-8) were recorded within or near to the permanent access road, however during 2017 the Schedule 1 (WCA) species marsh harrier was recorded nesting at the edge of Bicker Fen Substation (in close proximity to the location of the proposed AC cable route connection). This species was recorded to nest at the south eastern edge of the substation within an area of wetland vegetation.

5.9.7 Although there are records of barn owl in the surrounding area, and barn owl were recorded foraging around Bicker Fen Substation and along the railway line to the south of the permanent access road during the winter bird survey, no barn owls were recorded within the study area during any of the breeding bird surveys. The grassy field margins along the north, west and south boundaries of the proposed converter station site offer some limited foraging potential for barn owl, although there is no evidence to suggest these areas are used by this species. It is assumed that barn owl do occasionally use Bicker fen Substation for foraging purposes during the breeding season. There is no roosting or nesting barn owl habitat present within the proposed converter station, permanent access road and proposed AC cable route.

5.9.8 Due to moderate numbers of a few nesting S41 and red listed BoCC species, in numbers characteristic of the surrounding landscape, as well as the inclusion of a number of species in the Lincolnshire and Black Sluice IDB BAPs farmland birds species action plan, the breeding bird population is taken forward as an important ecological feature within the Local context.

5.10 Reptiles

5.10.1 No records of reptiles were returned within 1 km of the proposed converter station, permanent access road and proposed AC cable route (Appendix 21.1 and Figure 21.2).

5.10.2 There are limited habitats within the proposed converter station site, and along the permanent access road and proposed AC cable route which are suitable to support reptiles. These generally comprise unmanaged field margins and ditch banks where narrow strips of tussocky grass has been able to develop.

5.10.3 No evidence of reptiles was recorded during the reptile survey of the proposed converter station site (Appendix 21.10, Figure 21.17), and no incidental records of reptiles were made during other field surveys of the permanent access road and proposed AC cable route. However, a dead grass snake *Natrix natrix* was recorded to the west of the proposed converter station site and a common lizard *Zootoca vivipara* was observed to the north east of Bicker Fen Substation during habitat surveys in September 2016.

5.10.4 Although no reptiles were recorded during the survey at the proposed converter station site, the observation of grass snake and common lizard during other surveys indicates that these species (and potentially slow worm, based on habitat characteristics) are likely to be present at low densities in the area of the proposed converter station site, permanent access road and proposed AC cable route. In addition to their protection from killing and injury under the Wildlife and Countryside Act 1981 (as amended) (Ref 21-8), both grass snake and common lizard are S41 priority species under the NERC Act 2006 (Ref 21-6). Grass snake is also a priority species in

the Black Sluice IDB BAP (Ref 21-1). As a result, reptiles are taken forward for assessment as an important ecological feature at the Local level.

5.11 Other Fauna

5.11.1 Records were returned within 1 km of the proposed converter station, permanent access road and proposed AC cable route for S41 species brown hare *Lepus europaeus* from the area around the proposed converter station and west European hedgehog *Erinaceus europaeus* from Donington village to the east of the A52.

5.11.2 Several brown hare were recorded incidentally during other surveys of the proposed converter station, permanent access road and proposed AC cable route. The extensive arable nature of the area, interspersed with drains and unmanaged field margins provide ample suitable habitat for this species. However, there is no current standardised survey method for brown hare and consequently no targeted survey or attempt at estimating population size or density has been carried out. Due to the presence of brown hare within the proposed base scheme design and its NERC Act 2006 (Ref 21-6) S41 status, this species is taken forward for assessment as an important ecological feature in the context at the Local level.

5.11.3 Conversely the lack of scrub cover is likely to make the proposed converter station, permanent access road and proposed AC cable route less suitable for hedgehog. The small numbers that may be present are considered to have less than Local value and therefore this species is not taken forward for assessment. Any individuals that are present would be protected from harm as a result of RAMs put in place for other species groups e.g. reptiles.

5.11.4 Records were returned within 1 km of the proposed converter station, permanent access road and proposed AC cable route for S41 species cinnabar moth *Tyria jacobaeae.* Due to the paucity of records for invertebrates, the lack of diverse habitats available to them in the survey area and the intensive agricultural use of the landscape (which is likely to include techniques unsympathetic to invertebrates such as the use of pesticides that would kill invertebrates and herbicides that would remove forage or egg laying plants), this faunal group is not taken forward for assessment.

5.12 Summary of Important Ecological Features

5.12.1 Table 21.11 provides a summary of the important ecological features which have been identified within the survey area and may potentially be impacted by the proposed converter station site, permanent access road or proposed AC cable route.

Table 21.11 Summary of Important Ecological Features			
Ecological Feature	**Policy/Legislation**	**Ecological Value**	**Description**
South Forty Foot Drain (South Holland End) LWS	The Town and Country Planning Act 1990 SHLP Policy E1NA	County	Located 0.7 km west of the proposed converter station. The site supports a range of terrestrial and aquatic habitats and is an important wildlife corridor for the area.
Hedgerows	Hedgerow Regulations 1997 British Standard 5837: 2012 Trees in relation to construction S41 NERC 2006 BBLP Policy G2 Lincolnshire BAP Black Sluice IDB BAP	Local	The majority of hedgerows within the base scheme design are species-poor and dominated by hawthorn. One species-rich hedgerow is present along the proposed AC cable route
Woodland and Trees	British Standard 5837: 2012 Trees in relation to construction BBLP Policy G2 SELLP Policy 24Lincolnshire BAP (trees a priority habitat when with hedgerows)	Local	There are three blocks of plantation woodland and nineteen trees within the base scheme design that represent a locally valuable woodland habitat resource
Watercourses	BBLP Policy G2 SELLP Policy 24 Lincolnshire BAP Black Sluice IDB BAP	Local	Hammond Beck, a significant watercourse is present within the base scheme design as well as several field ditches

Table 21.11 Summary of Important Ecological Features			
Ecological Feature	**Policy/Legislation**	**Ecological Value**	**Description**
Great crested newts/ amphibian assemblage	Annex 2 and 4 Habitats Directive Conservation of Habitats and Species 2010 Schedule 5 Wildlife & Countryside Act (1981) (9(5) only) for all except GCN S41 NERC Act 2006 BBLP Policy G2 SELLP Policy 24 Lincolnshire BAP (newts) Black Sluice IDB BAP (newts)	Local	Small great crested newt (EPS) population in close proximity to AC cable route. Common toad (S41) and common frog recorded at proposed converter station. Small newt recorded from D716.
Bats	Annex 4 Habitats Directive Conservation of Habitats and Species 2010 Schedule 5 Wildlife & Countryside Act (1981) BBLP Policy G2 SELLP Policy 24 S41 NERC Act 2006 (some) Lincolnshire BAP Black Sluice IDB BAP	Local	Moderate bat potential tree on AC route. Low to moderate numbers of common bat species recorded during activity surveys, particularly along Hammond Beck.
Water vole	Schedule 5 Wildlife & Countryside Act (1981) S41 NERC Act 2006 BBLP Policy G2 SELLP Policy 24 Lincolnshire BAP Black Sluice IDB BAP	Local	Water vole recorded within Bicker Fen Substation. No records form surveys of ditches and drains within base scheme area, but suitable habitats present.

Table 21.11 Summary of Important Ecological Features			
Ecological Feature	**Policy/Legislation**	**Ecological Value**	**Description**
Badger	Protection of Badgers Act 1992 BBLP Policy G2 SELLP Policy 24	Local	One main sett, one annexe and six outlier setts (one clan) associated with the proposed converter station, permanent access road and AC cable route.
Wintering birds	S41 NERC Act 2006 BBLP Policy G2 SELLP Policy 24 Lincolnshire BAP (Farmland birds) Black Sluice IDB BAP (Farmland birds)	Local	Occasional use of site by small wader groups and moderate sized groups of starling, fieldfare and redwing.
Breeding birds	Wildlife & Countryside Act (1981) S41 NERC Act 2006 BBLP Policy G2 SELLP Policy 24 Lincolnshire BAP (Farmland birds) Black Sluice IDB BAP (Farmland birds)	Local	One pair marsh harrier (Schedule 1) breeding at Bicker Fen Substation and likely barn owl foraging in this location. Moderate numbers of a small number of S41/BoCC species characteristic of surrounding landscape.
Reptiles (grass snake, common lizard)	Schedule 5 Wildlife & Countryside Act (1981) (9(1) part, 9(5)) S41 NERC Act 2006 BBLP Policy G2 SELLP Policy 24 Black Sluice IDB BAP (grass snake)	Local	Grass snake and common lizard observed within the local vicinity and therefore assumed present at low densities.
Brown hare	BBLP Policy G2 SELLP Policy 24 S41 NERC Act 2006	Local	Small numbers observed in the area.

5.13 Baseline Projection

5.13.1 An integral part of ecological impact assessment is to consider the predicted trends of each of the ecological features if no development and mitigation were to be carried out.

5.13.2 With respect to the predominantly agricultural use of land within the planning application boundary, there is no indication that in the absence of development the use and therefore management of these areas would alter. The ecological value of these areas would remain at its existing level, or potentially decline as evidenced from long-term monitoring in similar landscapes as noted in the State of Nature report (Ref 21-46).

5.13.3 The small patches of woodland, occasional trees, if left undeveloped and unmanaged, would be expected to mature and increase in structural complexity, but expansion or improved connectivity would not be anticipated to occur naturally as agricultural practices adjacent would prevent this. Maturation of woodland would benefit the majority of faunal groups since this habitat resource is so limited in the area.

5.13.4 It is likely that the network of ditches and drains will continue to be managed in line with current practices. They will continue to provide supporting habitat and potential connectivity for several species, including terrestrial and aquatic species through the agricultural landscape.

5.13.5 In June 2009, the UK Climate Projections 2009 (Ref 21-47) were published on behalf of the Department for Environment and Rural Affairs (DEFRA) and the Department for Energy and Climate Change (DECC). The projections report in 30 year intervals, up to the 2020s, 2050s, and 2080s for three scenarios of emissions (low, medium, and high) based on work published by the Intergovernmental Panel on Climate Change (IPCC).

5.13.6 The projections suggest that all areas of the UK will get warmer, more so in the summer than in the winter. It is possible that in the 2080s mean temperatures across the UK will have increased by between 1.8 and 3.1°C in the winter and 2.5 and 4.2°C in the summer. The greatest increases will be in southern England with the smallest increases in northern Scotland.

5.13.7 By the 2080s, winter rainfall could increase by as much as 33% in some parts of the UK whilst summer rainfall could decrease by 40% in other areas. Sea levels around the UK could rise by between 12 and 76cm between 1990 and 2095.

5.13.8 Specifically, within the East Midlands temperatures are expected to rise by 2.2°C in winter, which is higher than most parts of England, and 2.5°C in the summer by the 2080's. By the 2050s, the indications are that rainfall could increase by up to 33% in the winter and by 13% in the summer.

6 Potential Impacts

6.1 Temporary Construction Impacts

6.1.1 For the purposes of this EIA, construction impacts are temporary or short-term occurring during the construction phase only. This includes impacts resulting from vegetation clearance, construction traffic, noise and vibration from construction plant and machinery, dust generation and site runoff as well as impacts resulting from temporary loss of agricultural land or other temporary impacts caused by access or compounds.

6.1.2 A range of embedded mitigation, legal compliance and good practice measures are described in the Basis of Assessment (Section 3), which will be implemented as part of the base scheme design. As it is certain these measures will be applied to the base scheme design, pre-mitigation impacts are assessed after taking these measures into account.

Designated Sites

6.1.3 South Forty Foot Drain LWS is located approximately 0.7 km to the west of the proposed converter station and will not be directly affected by construction activities. The LWS is connected hydrologically to drains within the base scheme design. It is possible that site run-off could enter the LWS via the drain network leading to degradation of the habitats for which the site is designated. However, embedded pollution prevention measures implemented through the CEMP will prevent the possible adverse effects. Therefore, it is extremely unlikely that there will be an adverse effect on the integrity of this County level site as a result of temporary construction activities. Therefore the effects on this site will be **not significant**.

Habitats

Hedgerows

6.1.4 There is the potential for temporary degradation of the habitats as a result of wind blown dust, debris, emissions and site run-off as well as accidental encroachment on habitats by construction traffic. Embedded pollution prevention measures implemented through the CEMP will prevent adverse effects associated with construction activities and emissions from construction traffic. Embedded hedgerow protection measures will ensure retained habitats are protected during construction activities and impacts will be extremely unlikely to occur. Taking into account the embedded mitigation, effects on hedgerows are **not significant** for the construction phase of the proposed converter station site, permanent access road and proposed AC cable route.

Woodland and Trees

6.1.5 As discussed for hedgerows, there is the potential for temporary degradation of the habitats. Embedded pollution prevention measures implemented through the CEMP will prevent adverse effects associated with construction activities and emissions from construction traffic. Embedded tree protection measures will ensure retained habitats are protected during construction activities. Taking into account the embedded mitigation prior to assessment it is extremely unlikely that impacts associated with temporary degradation will occur and therefore effects on woodland and trees are **not significant** for the construction phase of the proposed converter station site, permanent access road and proposed AC cable route.

Watercourses

6.1.6 Several temporary culverts will be required across watercourses along the proposed AC cable route. The permanent access road crosses Hammond Beck, a significant watercourse, and seven field ditches. A permanent bridge is proposed across Hammond Beck while the field ditches will be crossed using culverts.

6.1.7 There is the potential for temporary degradation of the habitats as a result of wind blown dust, debris, emissions and site run-off. Embedded pollution prevention measures implemented through the CEMP will prevent adverse effects associated with construction activities and emissions from construction traffic. It is extremely unlikely that impacts associated with temporary degradation will occur and therefore, effects on watercourses are **not significant**.

6.1.8 Where culverts are installed either for temporary access or for the permanent access road, disruption to the flow of watercourses during construction will be short-term with flow reinstated once culverts are in place and is extremely unlikely to have a significant effect on the ecological features of these watercourses. Therefore the effects will be **not significant.**

Great Crested Newt and other Amphibians

6.1.9 Desktop records indicate that a small population of GCN was recorded at Bicker Fen Substation in 2015. Since surveys were not possible in 2017 to verify current status, a precautionary approach would suggest that a small population is still likely to be present. It is possible that some drains may provide suitable breeding habitat if water levels are high enough for long enough during the breeding season.

6.1.10 Suitable terrestrial habitat comprising woodland, scrub and tussocky grassland is present in the Bicker Fen Substation and vegetated banks of the drainage network. Other amphibian species including small newts, common frog and common toad (NERC Act 2006 (Ref 21-6) S41 species) are also present within the base scheme design.

6.1.11 The construction works for the converter station site, permanent access road and the AC cable route will result in the permanent and short term temporary loss of amphibian terrestrial and aquatic habitat, particularly where drains and hedgerows are crossed. Given the small temporary

losses and the availability of similar habitats within the area it is extremely unlikely that significant effects would occur. Therefore this effect is considered to be **not significant**.

6.1.12 With respect to temporary fragmentation impacts, this has the potential to occur where watercourses (three wet ditches and six dry ditches) and hedgerows (six in total) are crossed along the permanent access road and proposed AC cable route, where temporary culverts or open cut crossings are required. These activities could prevent travel between breeding waterbodies or between hibernation sites and breeding waterbodies. However, given the temporary nature of any barriers to movement and the availability of similar habitats within the area it is extremely unlikely that significant fragmentation effects would occur. Therefore this effect is considered to be **not significant**.

6.1.13 There is the potential for killing or injury of amphibians during site clearance, installation of culverts (temporary and permanent), construction of permanent infrastructure and the connection works. There is the potential for amphibians to use soil piles and stored materials for refuge and hibernation which could result in killing or injury when these are moved. These effects could lead to a significant adverse effect at the Site level if unmitigated. However, RAMs are embedded into the scheme and will be employed during vegetation clearance and construction site management of soils and materials. With respect to GCN, the requirement for legal compliance is such that a European Protected Species (EPS) Derogation Licence granted by NE may be required in order to undertake specific mitigation in the vicinity of Pond P175 and Ditch D611 to ensure no killing or injury and maintenance of GCN favourable conservation status (FCS). As a result of the embedded RAMs and legal compliance requirements, it is extremely unlikely that impacts associated with construction will lead to killing or injury of GCN and other amphibians. Therefore the effects on amphibians with respect to killing and injury are **not significant**.

Bats

6.1.14 It is possible that tree T286 (moderate bat roost suitability), if retained, may be subject to temporary disturbance during installation of the AC cable. Although a roost was not confirmed present by field surveys, bat roosting in trees is dynamic. Should bats take up roosting in this tree at the time of works, which would be confirmed by pre-construction survey, it is possible that bats could be temporarily disturbed or displaced as a result, although it is extremely unlikely that this would affect their conservation status. However, embedded mitigation within the CEMP will ensure noise levels are kept to acceptable levels and tree protection measures will be implemented in order to minimise the effects of disturbance at this tree. Therefore it is near certain that any effects on roosting bats, if present, will be **not significant**.

6.1.15 Taking the worst case scenario, approximately 60 m of hedgerow will be removed at each of six hedgerows (a total of 425.22 m, some hedgerows are crossed at an angle) as a result of the proposed AC cable route. However, it is probable that the losses calculated above are an over estimation as hedgerow crossings, where adjacent to drains, will be trenchless. Therefore less hedgerow will in fact require removal to facilitate construction of a temporary haul road.

Assuming a temporary haul road crossing width of 10 m, it is probable that approximately 10 m of hedgerow would require removal at each hedgerow. Since fragmentation effects i.e. potential abandonment of a commuting route, can occur when gaps in excess of 10 m are present in a formerly intact feature for common bat species, it is probable that temporary fragmentation impacts will occur for a small numbers of bats during construction. However, embedded mitigation will ensure that temporary fencing will be placed across the hedgerow gaps each night to ensure that these linear features can still be used for navigation by the local bat population. Therefore temporary fragmentation impacts associated with hedgerow removal will be removed and the effect on the local bat population is near certain to be **not significant**.

6.1.16 The need for lighting is minimal. Where lighting during construction is required, embedded mitigation will ensure lighting is directed away from trees, hedgerows, woodland and watercourses to avoid the possibility of deterring bat. It is extremely unlikely that this will cause any fragmentation or displacement impacts to the foraging and commuting activities of the local bat population and therefore potential effects are **not significant**.

Water Vole

6.1.17 At present no water voles have been recorded in association with habitats that will be affected by construction of the base scheme design, with the exception of water vole recorded in the pond in Bicker Fen Substation (P175). The LoD of the proposed AC cable route is located approximately 5 m from this pond, which is generally taken to be an acceptable buffer between a water vole population and construction activities (Dean et al. (Ref 21-11). Dean et al. (Ref 21-11) states that noise and visual disturbance are in most cases unlikely to have a significant effect on water voles and therefore potential effects are **not significant**.

6.1.18 Although it is extremely unlikely that water vole would be at risk of killing or injury, given the 5 m buffer, the embedded legal compliance measures put in place for reptiles, great crested newts and other amphibians will also be certain to protect water voles and prevent their access to the working area. Therefore it is considered that any effects on water vole as a result of the temporary construction activities will be **not significant**.

Badger

6.1.19 It is certain that construction will unavoidably result in the requirement to permanently close two outlier badger setts (Setts S109 & S118) located within 30 m of the permanent access road; with both setts located within the working area. In addition, it is certain that permanent closure of an additional two setts will be required to facilitate construction of the converter station; an outlier (S116) and an annexe sett (S135). A further two setts lie within the LoD for the proposed AC cable route (S115 & S117); for the purpose of this assessment a worst case scenario has been assumed with the closure of these setts being necessary. However during detailed siting every effort will be made to retain both setts S115 and S117 and a 30 m exclusion buffer. A Natural England badger licence will be required in advance of any works to any of the setts identified.

Although these setts were found to be active at the time of survey, the dynamics of badger activity means that the activity levels are liable to change across the year. Outliers and annexes are not considered as critical to the local clan cohesion as the main sett. It is certain that the embedded mitigation measures, including the closure of setts through Natural England licence, will ensure that no detrimental impact on badgers is encountered and therefore the effect is considered to be **not significant**.

6.1.20 Although it has been determined based on the location of Sett 105 (outlier sett) that it can be retained through the construction period, it is certain that construction works will encroach within the 10-30 m zone from the sett entrances. Therefore there is a possible risk of damaging tunnels during construction and works will be undertaken via a Natural England licence, although this risk is considered to be low and **not significant**.

6.1.21 The main sett (S108) is to be retained within proposals. The route of the permanent access road was amended during the design stage to avoid Sett 108. Consequently, this sett lies approximately 35 m from the permanent access route. No construction works are proposed within the 30 m exclusion zone from the main sett and therefore **no impact** is anticipated.

6.1.22 It is possible that the construction of the permanent access road and proposed AC cable route will cause temporary fragmentation impacts. These fragmentation impacts would be exacerbated where the design of any security fencing during construction may impede badger movement. However, the provision of two-way badger gates within demarcation fencing along the proposed AC cable route and permanent access road will prevent fragmentation impacts on the local badger clan and their movements. Taking into account the embedded mitigation it is near certain that effects on the local badger clan as a result of fragmentation impacts will be **not significant**.

6.1.23 It is possible that killing, injury or entrapment of badgers (e.g. from site traffic and by falling into excavations) during the construction period, particularly during the proposed AC cable installation may occur. Trenches will be covered or fenced off at night, or egress ramps will be provided to prevent entrapment of badgers during construction. It is near certain that this will prevent killing and injury due to entrapment and therefore the effect on the badger clan is **not significant**.

6.1.24 It is certain that temporary habitat loss will occur as a result of construction of the proposed converter station, permanent access road and installation of the proposed AC cables. However ample alternative foraging habitat within the wide expanse of landscape is available in the immediate area therefore it is certain that this impact will not lead to significant effects on the badger clan. The effects of temporary habitat loss on the local badger clan are therefore **not significant**.

Wintering Birds

6.1.25 There is the potential for the proposed construction works to result in disturbance or displacement of small groups of waders. However, the largest flocks of waders only comprised 33 curlews and 80 lapwing and these were approximately 500 m distant from the permanent access road and were isolated from the base scheme design by the railway line. It is extremely

unlikely that significant numbers of waders would be affected by the base scheme design and therefore effects will be **not significant**.

6.1.26 The only waterbird species recorded within 500 m of the site were heron and little egret and these species were only present in low numbers. It is extremely unlikely that the proposed works would have any adverse effects on any wintering waterbird features and effects will be **not significant**.

6.1.27 Some moderate and large sized flocks of fieldfare, redwing and starling were recorded in the fields near to the proposed works. None of these birds were within the proposed converter station site. The majority were recorded within 500 m of the AC cable route and the permanent access road. Construction works carried out during the winter period could displace these large flocks into adjacent fields. Due to the prevalence of suitable nearby feeding habitat for these species it is considered extremely unlikely that this local displacement would adversely affect these species and therefore the effect will be **not significant**.

6.1.28 A maximum construction noise level of 61 dB at 50m and 54 dB at 250m has been predicted for the construction vehicles (Chapter 28). At 100m from the converter station, a maximum construction noise level of 44 dB is predicted. This is classified as low level noise and would be extremely unlikely to have a negative impact on wintering birds using fields near to the converter station site. Due to the distance of groups of waders and wildfowl recorded from the converter site, it is near certain that wintering birds using these areas would not be affected and the effect will be **not significant**.

Breeding Birds

6.1.29 The most abundant BoCC (Ref 10-19) breeding bird species within the area within which the proposed converter station, permanent access road or proposed AC cable route is located is skylark. This species nests within open fields and it is possible that up to 10 pairs of skylark could be affected, depending on these bird's nesting locations during the construction phase. It is possible that six pairs of skylark may also be displaced by construction of the permanent access road. Yellow wagtail is another red listed NERC Act 2006 (Ref 10-6) S41 ground nesting species which was also recorded breeding in low numbers within the area. It is possible that two pairs of yellow wagtail could potentially be displaced.

6.1.30 It is possible that one pair of yellowhammer and three pairs of linnet could be displaced by the proposed works. Another pair of linnet may be displaced by construction of the permanent access road. Due to the very limited removal of suitable nesting habitat for these species it is extremely unlikely that the proposed works would result in a significant effect on the local population of these species.

6.1.31 Reed bunting have been recorded to breed in low numbers within vegetated drains within the base scheme design and it is possible that four pairs of this species could be temporarily displaced during construction works. In addition, three pairs may be displaced by construction of the permanent access road. Due to the very limited removal of suitable nesting habitat for this

species it is extremely unlikely that the proposed works would result in a significant effect on the local population of this species.

6.1.32 It is possible that other bird species which are not of conservation concern, but which are still protected under the Wildlife and Countryside Act 1981 (Ref 21-8), are also likely to be nesting within woodland plantation and boundary features (e.g. blackbird and whitethroat). Due to the limited extent of removal of suitable nesting habitat for these species it is extremely unlikely that the proposed works would result in a significant effect on the local population of this species.

6.1.33 Marsh harrier, a Schedule 1 WCA 1981 species was recorded nesting at the edge of the Bicker Fen Substation within 100 m of the proposed AC cable route connection. It is likely that this species would be prevented from nesting in this location while this part of the works are carried out, due to disturbance caused by construction works. In England, marsh harriers have increasingly nested in arable fields, with over 20% recorded to nest in arable fields in 1995 (Ref 21-51). It is highly likely that there would be sufficient nearby undisturbed habitat available for nesting and therefore the effect on marsh harrier of temporary removal of suitable nesting habitat at this location would be **not significant**.

6.1.34 Overall, due to the prevalence of other similar habitats within the wider area, it is considered certain that temporary habitat loss due to construction of the proposed converter station, permanent access road and AC route will not adversely affect local bird populations and therefore the effect will be **not significant**.

6.1.35 It is possible that damage or destruction of a number of bird nests will occur during any vegetation clearance works carried out during the breeding bird season, including arable within open fields. However, to comply with wildlife legislation, avoidance measures comprising timing of works and implementation of nesting bird checks during vegetation clearance are embedded into the proposals. These measures are certain to ensure damage or destruction of nests is avoided. If Schedule 1 species are discovered that could be affected by proposed works, sufficient buffer zones of any nests present will be implemented to ensure these species are not disturbed while nesting. Therefore the effect on breeding birds with respect to killing, injury and nest destruction will be **not significant**.

6.1.36 Noise levels predicted within the Noise Assessment (Chapter 28) for the construction period are low. It is extremely unlikely that the predicted noise levels would adversely affect any breeding bird species and the effect will be **not significant**.

Reptiles

6.1.37 The majority of the works fall within low quality reptile habitat i.e. arable land. Unmanaged field margins, vegetated banks of drains (both of which are common in the wider area) and the small plantation woodland block provide better quality habitat which could support reptiles. Following the identification of grass snake and common lizard in the vicinity of the base scheme design, it is considered that reptiles are present at low densities in the area.

6.1.38 Due to the limited extent of suitable habitats present within the proposed works areas, and availability of other nearby habitats, the temporary loss of these habitats is not considered likely to affect the survival of local reptile populations or result in habitat fragmentation effects for reptiles. Therefore it is near certain that the potential effect of temporary habitat loss and fragmentation on the local reptile population is **not significant**.

6.1.39 It is possible that killing or injury of small numbers of reptiles during vegetation clearance works may occur. However, in compliance with wildlife legislation, embedded mitigation comprising RAMs during vegetation clearance will ensure killing or injury of reptiles is certain to be avoided. Therefore the effect will be **not significant**.

Brown Hare

6.1.40 Brown hares are known to be present in the general area following observation during surveys and from desktop records. The landscape containing the base scheme design area is, broadly speaking, homogeneous and the extent of suitable habitats for brown hare that would be affected is proportionally very small. Temporary losses which will be incurred as a result of construction of the proposed converter station, permanent access road and proposed AC cable route will not lead to a significant loss of suitable habitats or of fragmentation effects. Therefore the potential impact of temporary habitat loss and fragmentation is extremely unlikely to affect the brown hare population and therefore effects are **not significant**.

6.1.41 Due to their sensitivity to noise and activity it is possible that adult brown hare would suffer from localised perturbation once construction activities commence, the consequence of which is that they would be unlikely to be killed or injured as a result. Leverets, however, would remain susceptible to potential killing or injury during initial site clearance, depending on the timing of this activity, as they are left alone in forms during the day and may be reluctant to move; they are therefore at risk of late response to potential danger. It is also possible for hares to become trapped in excavations, pipes or wire mesh associated with construction activities, which may cause distress or injury. Embedded mitigation will be certain to ensure excavations are covered over and/or egress ramps provided in order to prevent entrapment. Overall there remains a possibility for killing or injury of small numbers of leverets is possible and this impact is assessed to be **significant adverse effect at the Local level**.

6.2 Longer Term, Operational and Permanent Impacts

6.2.1 For the purposes of this EIA longer term, operational and permanent effects are those which would occur as a result of the base scheme design's land take or as a result of its operation. This would include effects which may begin during construction and endure for the lifetime of the base scheme design (for example the loss of agricultural land for the construction of the proposed converter station), effects which may begin during construction and endure for an extended period of time (for example loss of a hedgerow which is then reinstated) or effects

which occur during operation only (for example noise emissions associated with operation of the converter station).

6.2.2 A range of embedded mitigation and good practice measures are described in the Basis of Assessment (Section 3), which will be implemented as part of the base scheme design. As it is certain these measures will be applied to the base scheme design, pre-mitigation impacts are assessed after taking these measures into account.

Designated Sites

6.2.3 South Forty Foot Drain LWS is located approximately 660 m to the west of the proposed converter station and will not be directly or indirectly affected by operational activities. The drainage scheme is designed to remove all potential pollutants prior to water entering the wider drainage network, which will avoid potential pollution effects on aquatic habitats. Air emissions during operation are considered to be negligible and will not lead to any impacts on the habitats which comprise the South Forty Foot Drain LWS. Therefore it is certain there will be no adverse effects on this County level site and the effect will be **not significant**.

Habitats

Hedgerows

6.2.4 The footprints for the proposed converter station and associated permanent access road do not contain any hedgerows.

6.2.5 The proposed AC cable route crosses six native hedgerows. Assuming the worst case scenario of the working corridor covering the entire working width of approximately 60 m, a total of 425.22 m (some hedgerows are crossed at an angle) of native species-poor hedgerow would require removal. None of the hedgerows meet the criteria for 'Important' under the Hedgerow Regulations 1997 (Ref 21-7). It is probable that the losses calculated above are an over estimation as hedgerow crossings, where adjacent to drains, will be trenchless. Taking this probable approach, less hedgerow may require removal to facilitate construction of a temporary haul road. Assuming a temporary haul road crossing width of 10 m, it is probable that approximately 60 m of hedgerow would require removal.

6.2.6 The embedded habitat reinstatement plan allows for in-situ replacement of the hedgerow habitat following construction, using a species mix comprising 40% hawthorn and 15% each of field maple, hazel, blackthorn and dog rose. These can be expected to have established and matured after approximately 5 years and hedgerows will be returned to their pre-construction functionality. Therefore, in the longer term, it is near certain that the effects of construction on hedgerows is considered to be **not significant**.

Woodland and Trees

6.2.7 The proposed converter station site does not contain any woodland or scattered tree habitats.

6.2.8 The permanent access road crosses the southern edge of a small isolated parcel of broad-leaved plantation woodland located south of Northope Farm, off North Ing Drove. The woodland was planted in the last 20 years and is approximately 0.04 ha. Construction will result in the certain permanent loss of 0.03 ha of this habitat. Fragmentation or further isolation of the plantation woodland block will not result from the habitat loss, as the loss occurs only along the southern edge.

6.2.9 The proposed AC route crosses two parcels of broad-leaved plantation woodland associated with the Bicker Fen Substation. A reasonable worst case is that a maximum 0.22 ha will be lost in combination at these locations.

6.2.10 It is near certain that 18 trees will be lost as a result of construction of the permanent access road. These are located at the junction of the permanent access road with the A52.

6.2.11 It is possible that construction at the northern end of the proposed AC cable route will result in the loss of one mature white willow tree (T286). This is a reasonable worst case scenario, although it is possible that there is room within the LoD for it to be avoided.

6.2.12 Reinstatement of woodland and trees in-situ will not be possible for the permanent access road as this is a permanent feature or over the proposed AC cable permanent easement because deep tree roots could affect the integrity of the cables. Tree cover is rare in the landscape within and surrounding the base scheme design. Therefore permanent losses of these habitats represent a **significant adverse effect at the Local Level**.

6.2.13 However, the landscape scheme for the proposed converter station will cover a 9 ha area and will include substantial woodland planting and individual trees along with associated shrub planting (see ES-2-C-.06, Chapter 22 Landscape & Visual Amenity). These areas will be planted up during the reinstatement phase of construction and it is near certain that they will reach a height of 7–10 m after 15 years. Should tree T286 be lost, compensation for this mature white willow is, extremely unlikely to be achieved within 20 to 30 years due to its level of maturity. Overall, the longer term effects of this design mitigation will lead to an increase in woodland and tree cover within the area and therefore is considered to have a **significant beneficial effect at the Local level**.

Watercourses

6.2.14 The proposed converter station lies adjacent to three ditches. It is certain that a permanent outfall will be installed in the drain running adjacent to North Ing Drove to allow for drainage of the proposed converter station. Given the abundance of similar bankside habitat in the vicinity, the small area of habitat permanently lost as a result of the outfall is certain to be **not significant**.

6.2.15 The Outline Drainage Strategy (Document reference VKL-08-39-G500-015) which has been designed for the proposed converter station will ensure that pollution events or changes to the hydrological regime for the wider ditch network will be avoided through a system of separators and filters that will treat surface water run-off from the converter station platform prior to

discharge offsite. This will ensure that effects on watercourses as a result of operational activities will be **not significant**.

6.2.16 The permanent access road crosses Hammond Beck, a significant watercourse, and seven field ditches. A permanent bridge is proposed across Hammond Beck. This will result in the certain permanent loss of 20 m of bankside habitat. The field ditches will be crossed using culverts which, based on the worst case scenario of the working corridor for these crossings covering the entire working width of 10 m to 15 m (on average), will result in the probable temporary loss of 105.78 m of bankside habitat and certain permanent loss of 99.43 m of bankside habitat. However, bankside habitats are abundant within the local area and the permanent loss of approximately 119.43 m will not undermine the ecological function of the drains with respect to dispersal of flora or movement of fauna. Therefore it is certain that the effect on watercourse habitats is **not significant**.

6.2.17 Once construction is completed, watercourse bank habitats will be left to recolonise naturally so as not to introduce non-naturalised or invasive species from the outside area. If bank and soil stabilisation is required, this will be provided by the use of geotextile or coir matting. It is near certain that bankside and aquatic vegetation will be re-established within 2-4 years. Therefore, over the longer term, effects following temporary losses will be **not significant**.

6.2.18 The proposed AC cable route crosses eight field ditches but no bankside habitat loss is anticipated as trenchless crossings are proposed. However, a temporary haul road will be installed along these crossings. Assuming a crossing width of 10 m, it is probable that approximately 80 m of bankside habitat will be temporarily lost. Once construction is complete watercourse bank habitats in these locations will be left to recolonise naturally as discussed above. Therefore, over the longer term, effects following temporary losses will be **not significant**.

Great Crested Newt and other Amphibians

6.2.19 It is possible that a reduction in water quality will occur as a result of pollution, nutrient enrichment and changes to water levels, which could reduce the suitability of waterbodies to support amphibians during operation of the converter station site. The Outline Drainage Strategy (Document reference VKL-08-39-G500-015) for the proposed converter station will ensure that pollution events or changes to the hydrological regime for the ditch network will be certain to be avoided through a system of separators and filters which will treat surface water run-off from the site prior to discharge. No other effects on water quality with respect to its ability to support amphibians are anticipated. Overall the effects on water quality with respect to its suitability to support amphibians as a result of operational activities will be **not significant**.

6.2.20 The converter station site and permanent access road for the most part are located within arable fields which are of low suitability to amphibians, including GCN. Unmanaged field margins, vegetated banks of drains (both of which are common in the wider area), woodland, scrub and hedgerows provide better quality terrestrial habitat which could support amphibians. The

extensive drainage network has the potential to provide suitable breeding habitat. Due to the prevalence of these habitats in the wider area, the small permanent losses as a result of the implementation of the proposed converter station site and permanent access road are extremely unlikely to lead to a significant loss of suitable habitats or of fragmentation impacts on amphibians. Therefore the effects on the local amphibian population of permanent habitat loss and fragmentation is **not significant**.

6.2.21 Landscaping works including tree and shrub planting are certain to be carried out within the proposed converter station site. It is probable that an attenuation pond will be created within the attenuation zone of the proposed converter station site, which although not ideal for breeding GCN due to fluctuating water levels, will enhance general habitat diversity and foraging opportunities. Once established, in the longer term, these are near certain to result in beneficial effects for amphibians with respect to the provision of additional habitats for foraging, breeding and refuge. Therefore the longer term effects on the local amphibian population of the landscaping will be a **significant beneficial effect at the Local level**.

Bats

6.2.22 Tree T286 offers moderate roost potential (larger numbers of bats or for longer periods, but unlikely to be suitable for high conservation status roosts) and is located within the LoD for the proposed AC cable route near its entry point to Bicker Fen Substation. It is not currently known whether this tree can be retained within the design and therefore as a worst case scenario it is possible that this tree will be lost. Although a roost was not confirmed as present during surveys, this tree retains the potential to support roosting bats and is the only potential roost feature within the base scheme design in a locality where roost features are scarce. Loss of this potential roost would be permanent and would limit roosting opportunities in the locality given the already limited roosting opportunities. Therefore the effect of loss of T286 on the local bat population would be significant adverse at the Local level. However, embedded legal compliance measures will ensure that pre-construction surveys are implemented to identify the presence or absence of roosting bats prior to removal, and replacement roost boxes will be installed in suitable locations regardless of whether bats are found to be present in order to ensure the potential for roosting bats is maintained. If roosting bats are confirmed by pre-construction survey, then a NE Derogation Licence will be required to undertake removal of the tree. These measures would be certain to ensure that effects on the bat population and provision of roosting opportunities as a result of construction impacts will be **not significant**.

6.2.23 Based on the discussion of hedgerow removal in Section 6.1 it is possible that there will be longer term fragmentation impacts following completion of construction, which could lead to significant effects on the local bat population. As part of the embedded design mitigation it is certain that the hedgerows affected by the proposed AC route will be reinstated and would be established and matured after approximately 5 years, when functionality as linear commuting corridors would be returned. Additional temporary fencing will ensure hedgerows are functional

while the planting establishes and matures. Therefore it is near certain that the effect on commuting and foraging bats with respect to hedgerow losses as result of the proposed AC cable route will be **not significant**.

6.2.24 It is possible that permanent fragmentation effects may occur as a result of the installation of the bridge over Hammond Beck and the loss of trees along the A52. The bridge design for Hammond Beck will ensure an approximate 3 m clearance between the water level and underside of the bridge platform. It will be approximately 8 m wide. Proportionately higher levels of bat activity (predominantly common pipistrelle bats) were recorded along Hammond Beck which would suggest that this feature is used as a commuting route and foraging resource for bats in the immediate landscape. Bats are known to fly under and over bridges and have been observed flying under bridges with as little as 1 m clearance (pers. comm. Rachel Roberts). It is therefore probable, that given its size, installation of the bridge over Hammond Beck will not cause permanent fragmentation effects on the local bat population. With respect to the loss of trees along the A52 to facilitate the junction for the permanent access road, these trees do not form part of a strong continuous feature which bats might use for commuting along. In addition, very little bat activity was recorded along this feature during activity transects. Therefore, it is probable that loss of these trees will not cause permanent fragmentation effects on the local bat population. Overall it is probable that the effects of fragmentation will be **not significant**.

6.2.25 It is certain that approximately 0.03 ha of the plantation woodland, 18 trees along the A52 entrance to the permanent access road and small areas of watercourses will be permanently lost to facilitate construction of the permanent access road. The majority of the plantation woodland block will be retained and will remain available as a localised foraging resource for bats. The permanent habitat loss from the plantation woodland is wholly at the southern end, so no long-term or permanent fragmentation effects will result. With respect to the trees which will be lost along the A52, this is extremely unlikely to affect the foraging resource in this area due to the presence of adjacent woodland and hedgerows within Donington village. Up to 0.22 ha of woodland may also be lost to facilitate construction of the proposed AC cable route. Overall, although woodland and tree cover is sparse in the area, the losses incurred are not considered to affect the foraging resource for bats to a significant level. Therefore it is considered near certain that effects with respect to permanent habitat loss will be **not significant**.

6.2.26 It is certain that tree and shrub planting will be implemented around the proposed converter station site. Once established in the longer term, along with the probable creation of an attenuation pond, these new habitats will provide additional foraging and stepping stone habitat for bats. This will be a **significant beneficial effect at the Local level**.

6.2.27 It is certain that lighting of the proposed converter station during operation will be motion activated and directional. Limited night time lighting may occasionally be required during specific operations. Landscape planting, once established in the longer term, will serve to screen lighting within the converter station site. It is certain that no lighting is proposed along the permanent access road. As a result, operational impacts on commuting and foraging bats with respect to artificial lighting are certain to be **not significant**.

Water Vole

6.2.28 At present no water voles have been recorded in association with habitats that will be affected by construction of the base scheme design, with the exception of water vole recorded in the pond in Bicker Fen Substation. Once construction is complete it is near certain that no longer term, operational or permanent impacts on water vole at this location will occur. The adjacent grassland habitats will be reinstated and will recover within 2 to 4 years. Therefore it is near certain that effects on the water vole population in pond P175 will be **not significant**.

Badger

6.2.29 Construction of the proposed converter station and permanent access road will result in the certain permanent loss of badger foraging habitat. However, the majority of permanent habitat loss comprises arable, which is will be suboptimal foraging for badgers compared with other habitats such as grassland, hedgerow, scrub and woodland. Permanent losses of more suitable habitats from within the proposed converter station and permanent access road are proportionately small and sufficient alternative foraging habitat within the wider landscape is available in the immediate area; therefore this impact is certain to be considered to be **not significant**.

6.2.30 There is the potential for permanent fragmentation impacts as a result of fencing of the permanent access road which would sever links between the main badger sett S108 from its associated outlier sett (S107). However, the fence will be of a post and wire (three to four strands) design with farm access gates to adjacent agricultural fields. This design will enable well-established paths between setts and foraging areas to be maintained and therefore it is certain that any effects associated with fragmentation will be **not significant**.

6.2.31 Use of the permanent access road during operation will be limited (estimated to be approximately 12 movements per day), particularly during the hours of darkness when badger are most active. Embedded mitigation includes the installation of warning signs by the road in locations approaching the crossing points. Therefore the potential for killing or injury as a result of road traffic collision is extremely unlikely and the effects will be **not significant**.

6.2.32 Lighting of the proposed converter station during operation will be motion activated and directional. Limited night time lighting may occasionally be required during specific operations. No lighting is proposed along the permanent access road. Screening of the proposed converter station and permanent access road will be effective in the longer term as landscape planting matures, which will further reduce interference effects from artificial light. As a result, effects on the local badger population from artificial lighting are considered to be **not significant**.

Wintering Birds

6.2.33 No waders or wildfowl were recorded within the proposed converter station or permanent access road and occasional buzzard and kestrel were the only raptors recorded at the site perimeter of

the proposed converter station. No starling, fieldfare or redwing were recorded in the proposed converter station and only very low numbers were recorded adjacent to the proposed access road. Therefor it is certain there will therefore be no long-term loss of wintering habitats for these bird groups. The proposed AC cable route will not result in long term effects on wintering birds. Therefore no longer term or permanent effects are anticipated on wintering birds and the impact is **not significant**.

6.2.34 Noise from operation of the proposed converter station will be of a low level and it is certain it will not affect the winter bird population. As a result, noise effects are certain to be **not significant.**

Breeding Birds

6.2.35 The construction of the proposed converter station will result in the permanent loss of approximately 27 ha arable, an area known to support up to 10 pairs of skylark and 2 pairs of yellow wagtail. However, suitable habitat for these species is prevalent within the surrounding area, and although these species are abundant within this landscape, due to the sharp national decline of these species over the last 50 years, the populations are not likely to be near carrying capacity in this area. Therefore, minor displacement of this number of these species is extremely unlikely to have a significant effect on the local population of these species.

6.2.36 Skylark is a ground nesting species which tends to nest away from field boundaries and roads. These features, which introduce predatory risk, are limited across the base scheme design area. There is therefore the potential for the installation of the permanent access road and its associated fencing to result in the permanent displacement of 6 pairs of breeding skylark. The permanent displacement distance from the permanent access road due to disturbance caused by road traffic is extremely likely to be very low, due to the very occasional usage of the permanent access road, but may be increased as a result of potential predator risk. However, it is likely that the 6 pairs of skylark would still be able to successfully nest within the same field where the displacement occurs, given the area available to them.

6.2.37 Overall the impact of permanent habitat loss as a result of the proposed converter station and permanent access road on breeding birds is certain to be **not significant**.

6.2.38 Landscaping works including tree and shrub planting will be carried out within the converter station site. Once established, this landscaping will screen surrounding habitats from potential visual and light disturbances and thus avoid significant perturbation of birds nesting in adjacent habitats.

6.2.39 An attenuation pond will be created within the proposed converter station. Once established in the longer term the pond and the landscape planting are likely to result in beneficial effects on a range of breeding bird species including BoCC (Ref 21-19) and NERC Act 2006 (Ref 10-9) S41 species such as dunnock, linnet and yellowhammer. Therefore the longer term effects of the landscaping will have a **significant beneficial effect at the Local level**.

6.2.40 Noise from operation of the proposed converter station will be of a low level and will not affect the winter bird population. As a result, noise effects are considered to be **not significant.**

Reptiles

6.2.41 The proposed converter station and permanent access road are, for the most part, located within arable fields which are of low suitability to reptiles. Unmanaged field margins, vegetated banks of drains (both of which are common in the wider area) and the small plantation woodland block provide better quality habitat which could support reptiles. Due to the prevalence of these habitats in the wider area, the certain permanent loss of approximately 0.28 ha suitable (non-arable) habitats as a result of the proposed converter station and permanent access road is extremely unlikely to be to lead to a significant loss of suitable habitats or of fragmentation impacts on the local reptile population. Therefore the effects on the local reptile population of permanent habitat loss and fragmentation is near certain to be **not significant**.

6.2.42 Certain landscaping works including tree and shrub planting will be carried out within the proposed converter station site. An attenuation pond will be created within the proposed converter station site. Once established, in the longer term, these are likely to result in beneficial effects for reptiles with respect to the provision of additional habitats for foraging and refuge. Therefore it is near certain the longer term effects of the landscaping will have a **significant beneficial effect at the Local level**.

Brown Hare

6.2.43 Brown hares are known to be present in the base scheme design area. The extensive nature of suitable habitats for brown hare in the local area would suggest that the certain small scale of permanent losses that will result from construction of the proposed converter station and permanent access road would be extremely unlikely to lead to a significant loss of suitable habitats. Therefore the potential impact of permanent habitat loss is **not significant**.

6.2.44 There is the potential for permanent fragmentation impacts as a result of fencing of the permanent access road which would create a barrier effect for brown hare. However, the fence will be of a post and wire (three to four strands) design with gate access to adjacent agricultural fields. This design will enable free movement of brown hares and therefore it is certain that any effects associated with fragmentation will be **not significant**.

6.2.45 It is possible that killing or injury of brown hares as a result of road traffic collisions on the permanent access road may occur during operation. Use of the permanent access road will be limited during operation (estimated to be approximately 12 movements per day). Brown hares are easily disturbed and would be expected to move away from moving vehicles. Therefore the potential for killing or injury as a result of road traffic collision is extremely unlikely and the effects will be **not significant**.

6.2.46 It is certain that landscaping works will include grassland planting amongst tree and shrub planting within the proposed converter station site. Once established, in the longer term, these grassland areas are near certain to result in beneficial effects for brown hare with respect to the provision of additional habitats for foraging and refuge. Therefore the longer term effects of the landscaping will have a **significant beneficial effect at the Local level**.

6.3 Decommissioning Impacts

6.3.1 The anticipated operational life of the proposed converter station is approximately 40 years, although it is likely that its life will be extended beyond this as a result of refurbishment and plant replacement. In the event that Viking Link ceases operation the base scheme design would be decommissioned. It is currently assumed that the converter station, associated infrastructure and AC cables would be removed; the cables could be left in-situ but removal is the likely worst case scenario. It is anticipated that the permanent access road and all landscaping (including the attenuation pond) would be left in place.

6.3.2 In broad terms, the effects associated with decommissioning would reflect those described for the construction phase and similar mitigation would apply. The significance of effects would depend on the future land use i.e. the nature and extent of habitats which would be present at the time of the decommissioning process and so too the ecological value of these and associated fauna. However, it is anticipated that agriculture will remain the dominant land use in this area at the time of decommissioning.

6.3.3 Habitats most substantially affected would be those located in the immediate vicinity of the converter station and AC cable route. Habitats that have been created at the periphery of the converter station site as part of the landscape scheme and biodiversity enhancement package would continue under the agreed management arrangements and, where appropriate, licence conditions for a five year period beyond National Grid ownership.

6.3.4 Appropriate ecological surveys would be carried out prior to decommissioning in accordance with best practice guidance at that time to establish the relevant baseline. As with the construction phase, mitigation would be delivered through sensitive working practices (including alignment of access routes and seasonal constraints) and be subject to Method Statements and licensing where appropriate.

6.3.5 As part of habitat reinstatement following decommissioning, opportunities for ecological enhancement, particularly in terms of habitat connectivity across the local landscape, would be reviewed as part of the mitigation strategy.

6.4 Summary of Potential Impacts

6.4.1 The following Table 21.12 provides a summary of the temporary, longer term, operational, permanent and decommissioning impacts identified as a result of the proposed base scheme design.

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
Construction Impacts				
South Forty Foot Drain LWS	County	No direct impacts as approximately 660 m west of the proposed converter station. Embedded pollution prevention will prevent indirect impacts with near certainty. Therefore integrity of site will not be affected.	**Not significant**	**No**
Hedgerows	Local	Embedded pollution prevention measures implemented through the CEMP will prevent (with near certainty) adverse impacts associated with construction activities and emissions from construction traffic. Embedded hedgerow protection measures will ensure (with near certainty) retained habitats are protected during construction activities.	**Not significant**	**No**
Woodland and Trees	Local	Embedded pollution prevention measures implemented through the CEMP will prevent (with near certainty) adverse impacts associated with construction activities and emissions from construction traffic. Embedded tree protection measures will ensure (with near certainty) retained habitats are protected during construction activities.	**Not significant**	**No**
Watercourses – Field ditches	Local	Embedded pollution prevention measures implemented through the CEMP will prevent (with near certainty) adverse impacts associated with construction activities and emissions from construction traffic. It is certain that disruption to the flow of watercourses during construction will be short-term with flow reinstated once culverts are in place	**Not significant**	**No**
Watercourses - Hammond Beck	Local	Embedded pollution prevention measures implemented through the CEMP will prevent (with near certainty) adverse impacts associated with construction activities and emissions from construction traffic. It is certain that disruption to the flow of watercourses during construction will be short-term with flow reinstated once culverts are in place.	**Not significant**	**No**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
Amphibians – GCN, common frog, common toad	Local	Prevalence of similar habitats in the vicinity of the base scheme design available for use by these species during construction. Therefore it is certain no impacts will occur due to habitat loss.	**Not significant**	**No**
		It is certain no fragmentation impacts will occur as a result of construction since adjacent suitable habitat available.	**Not significant**	**No**
		Embedded reasonable avoidance measures during vegetation clearance will ensure (with near certainty) no killing or injury.	**Not significant**	**No**
Bats	Local	If tree T286 is retained, it is possible that disturbance impacts will occur. However, embedded management of noise levels in the CEMP and standard tree protection measures will ensure (with near certainty) bats, if present, will not be impacted.	**Not significant**	**No**
		Gaps of up to 60 m may be removed from six hedgerows as a result of the proposed AC cable route with probable fragmentation impacts. However, embedded mitigation using temporary fencing across the gaps would be near certain to mitigate fragmentation impacts.	**Not significant**	**No**
		Lighting during construction anticipated to be intermittent and of short duration during construction and therefore is extremely unlikely to impact on foraging and commuting bats.	**Not significant**	**No**
Water vole	Local	Water vole recorded in pond P175 which is located 5m from LoD of proposed AC cable route. It is extremely unlikely that disturbance impacts will occur due to the 5 m buffer and because water vole are generally quite resilient.	**Not significant**	**No**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
		It is extremely unlikely that impacts due to killing and injury will occur due to the 5 m buffer. However, legal compliance requirements for other protected species (reptiles, GCN) would make it certain that no killing or injury of water voles would occur.	**Not significant**	**No**
Badger	Local	Certain closure of three outlier setts and one annexe sett. Possible closure of two outlier setts. Embedded legal compliance via Natural England badger licence is required to cover these works and is certain to ensure no significant effects.	**Not significant**	**No**
		Works to be undertaken within 10 – 30 m buffer from one outlier sett although possible risk of damage to tunnels is low. Natural England licence to cover these works.	**Not significant**	**No**
		Possible temporary fragmentation impacts associated with the proposed AC cable route and permanent access road. However, embedded mitigation via use of badger gates near certain to ensure no effects on badger clan.	**Not significant**	**No**
		Possible risk of killing or injury to badgers in the event that badger falls into/becomes entrapped within excavations. However, embedded mitigation by covering trenches at night or use of egress ramp near certain to ensure no effects on badger clan.	**Not significant**	**No**
		Certain temporary loss of badger foraging habitat. However ample alternative foraging habitat available and therefore certain that no significant effects will occur.	**Not significant**	**No**
Wintering birds	Local	Certain temporary displacement during construction activities. However, due to ample alternative habitat in the vicinity, it is certain that the winter bird population will not be adversely affected.	**Not significant**	**No**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
		Noise from construction of the proposed converter station will be of a low level and will be extremely unlikely to effect the winter bird population.	**Not significant**	**No**
Breeding birds	Local	Certain temporary loss of nesting and foraging habitat. However ample alternative nesting and foraging habitat available and therefore certain that no significant effects will occur.	**Not significant**	**No**
		It is possible that damage or destruction of nests of several species may occur during vegetation clearance and construction activities. Embedded legal compliance measures via nesting bird checks during the breeding season will ensure with certainty that damage and destruction of nests is prevented.	**Not significant**	**No**
		Noise levels from construction activities will be of a low level and will be extremely unlikely to effect the breeding bird population.	**Not significant**	**No**
Reptiles	Local	Certain temporary loss of potential foraging habitat. However certain that limited extent of these habitats and availability of alternative habitat means no significant effects will occur.	**Not significant**	**No**
		Possible that killing or injury during vegetation clearance and construction activities may occur. Embedded mitigation via RAMs certain to ensure this impact is prevented.	**Not significant**	**No**
Brown Hare	Local	Certain temporary loss of potential suitable habitat. However certain that ample availability of alternative habitat means no significant effects will occur.	**Not significant**	**No**
		It is possible that killing or injury of young hares (leverets) during site clearance may occur, and of individuals that may get trapped in excavations. Certain embedded mitigation will prevent entrapment, but leverets still at risk leading to potential significant effects.	**Significant adverse at the Local level**	**Yes**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
Longer Term, Operational and Permanent Impacts				
South Forty Foot Drain LWS	County	Designed in drainage system will ensure no pollution of this LWS and therefore certain there will be no effects on integrity of the LWS.	**Not significant**	**No**
Hedgerows	Local	Probable temporary loss of 60 m of hedgerow habitat associated with the AC cable route. However, embedded habitat reinstatement plan allows for in-situ replacement of the hedgerow habitat following construction and near certain re-establishment after 5 years.	**Not significant**	**No**
Woodland and Trees	Local	Loss of up to 0.25 ha (0.03 ha certain, 0.22 ha possible) of broad-leaved plantation woodland and near certain loss of 18 trees. Reinstatement of woodland and trees in-situ will not be possible for the permanent access road as this is a permanent feature or over the proposed AC cable permanent easement.	**Significant adverse at the Local level**	**Yes**
		The landscape scheme for the converter station will provide woodland and individual tree planting along with associated shrub planting, near certain to reach 7–10 m after 15 years. The longer term effects of this design mitigation will lead to an overall increase in woodland and tree cover within the area.	**Significant beneficial at the Local level.**	**Yes**
Watercourses	Local	It is certain that a permanent outfall will be installed in the drain adjacent to North Ing Drove to allow for drainage from the proposed converter station. This will result in the permanent loss of a very small amount of bankside habitat, but given the amount of available similar habitat it is certain there will be no significant effect.	**Not significant**	**No**
		Possible pollution events at the proposed converter station are certain to be avoided by the incorporation of separators and filters to clean water before discharge to the drainage network.	**Not significant**	**No**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
		Certain permanent loss (associated with the permanent access road) of approximately 119.43 m of bankside habitat. However abundance of this habitat type in the vicinity ensures certain maintenance of ecological function and therefore no significant effects.	**Not significant**	**No**
		Probable temporary loss (associated with the permanent access road) of approximately 105.78 m of bankside habitat which will be reinstated through natural colonisation and will be near certain re-established within 2-4 years.	**Not significant**	**No**
		Probable temporary loss (associated with the proposed AC cable route) of approximately 80 m of bankside habitat which will be reinstated through natural colonisation and will be near certain re-established within 2-4 years.	**Not significant**	**No**
Great Crested Newt and other amphibians	Local	Possible reduction in water quality from proposed converter station site run-off. Certain to be avoided by by the incorporation of separators and filters to clean water before discharge to the drainage network.	**Not significant**	**No**
		Certain permanent habitat loss of limited area and suitability for amphibians is extremely unlikely to cause any significant effects.	**Not significant**	**No**
		The certain landscape planting and probable attenuation pond will provide additional suitable habitats for amphibians to utilise and are near certain to have a beneficial effect on the local population.	**Significant beneficial at the Local level**	**Yes**
Bats	Local	One tree T286 with moderate potential to support roosting bats is present within the LoD for the proposed AC cable route. It is possible that this potential bat roost will be lost. Embedded legal compliance via NE licence would be certain to ensure provision of replacement roost opportunities and protection of bats, leading to no significant effects.	**Not significant**	**No**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
		Certain that longer term fragmentation impacts could occur as a result of hedgerow losses. Use of temporary fencing while reinstatement planting matures is near certain to ensure commuting corridors maintained.	**Not significant**	**No**
		Possible permanent fragmentation due to bridge over Hammond Beck and tree loss on A52. However, discussion of impacts and bat activity indicates probable that no effects will occur.	**Not significant**	**No**
		Certain permanent habitat loss of 0.06 ha woodland, 18 trees and 105 m of watercourse/bankside habitats extremely unlikely to lead to significant loss of foraging habitat.	**Not significant**	**No**
		The certain landscape planting and probable attenuation pond will provide additional suitable foraging habitats for local bat population to utilise and are near certain to have a beneficial effect.	**Significant beneficial at the Local level**	**Yes**
		Lighting during operation will be motion activated and directional, with limited night time lighting for specific operations. Landscape planting will screen lighting in the longer term. No lighting on permanent access road. Certain to have no significant effect on foraging and commuting bats.	**Not significant**	**No**
Water vole	Local	Near certain that no longer term, operational or permanent impacts will occur that could lead to significant effects on the population in pond P175.	**Not significant**	**No**
Badger	Local	Certain permanent loss of foraging habitat but abundant alternative habitat available and therefore certain to be no significant effects.	**Not significant**	**No**
		Certain permanent fencing of the permanent access road will be post and wire design, enabling free movement of badger along well established paths particularly between the main badger sett S108 and an outlier sett S107. No severance effects anticipated.	**Not significant**	**No**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
		Possible killing and injury through collision with traffic on permanent access road. However, traffic expected to be limited, particularly at night. Therefore potential effects are extremely unlikely.	**Not significant**	**No**
		Lighting during operation will be motion activated and directional, with limited night time lighting for specific operations. Landscape planting will screen lighting in the longer term. No lighting on permanent access road. Certain to have no significant effect on local badger population.	**Not significant**	**No**
Wintering birds	Local	Very limited numbers of winter birds used the areas of permanent habitat loss and therefore it is certain there will be no longer term or permanent effects on winter birds.	**Not significant**	**No**
		Noise from operation of the proposed converter station will be of a low level and it is certain it will not affect the wintering bird population.	**Not significant**	**No**
Breeding birds	Local	Construction of the converter station and permanent access road will result in some permanent habitat loss for some ground nesting farmland bird species. Due to the prevalence of suitable habitat available for these species within the surrounding landscape, certain this will not impact the local population of these species.	**Not significant**	**No**
		Once established in the longer term the pond and the landscape planting are likely to result in certain beneficial effects on a range of breeding bird species including BoCC and S41 species such as dunnock, linnet and yellowhammer.	**Significant beneficial at the Local level**	**Yes**
		Noise from operation of the proposed converter station will be of a low level and it is certain it will not affect the breeding bird population.	**Not significant**	**No**
Reptiles	Local	Certain permanent habitat loss of limited area and suitability for amphibians is extremely unlikely to cause any significant effects.	**Not significant**	**No**

Table 21.12 Summary of Potential Impacts				
Description of Receptor	**Value**	**Description of Potential Impact**	**Significance**	**Significant**
		The landscape planting and attenuation pond will provide additional suitable habitats for common reptiles to utilise which are certain to have a beneficial impact on the local population.	**Significant beneficial at the Local level**	**Yes**
Brown Hare	Local	Certain permanent habitat loss of limited area and suitability for brown hare is extremely unlikely to cause any significant effects.	**Not significant**	**No**
		Certain permanent fencing of the permanent access road will be post and wire design, enabling free movement of brown hare. No severance effects anticipated.	**Not significant**	**No**
		Possible killing and injury through collision with traffic on permanent access road. However, traffic expected to be limited, and brown hare to move away from disturbance. Therefore potential effects are extremely unlikely.	**Not significant**	**No**
		The landscape planting near certain to provide additional cover and forage which would be beneficial.	**Significant beneficial at the Local level**	**Yes**
Decommissioning Impacts				
Receptors will be similar to those during construction	Various	Likely to be similar to those associated with construction, taking into account design mitigation and compliance with current legislation.	**Various**	**Various**

7 Mitigation

7.1 Additional Mitigation

7.1.1 This section sets out the ecological mitigation measures that will be delivered as part of the planning application which are in addition to those already described as design or embedded mitigation, or as legal compliance within the Basis of Assessment (Section 3).

7.1.2 The majority of potential ecological impacts have been addressed through the embedded ecological mitigation or the requirement for legal compliance during construction activities primarily to avoid killing and injury to protected species.

7.1.3 Additional mitigation is included below for brown hare which although it is a NERC Act 2006 (Ref 21-6) S41 species of principal importance is not legally protected.

Temporary Construction Impacts

Brown Hare

7.1.4 As there is the potential for brown hare leverets to be present within the proposed converter station site, permanent access road and proposed AC cable route, a RAMs will be produced and implemented during site clearance works to ensure no killing or injury to individuals. A walkover of the construction areas by a suitably qualified ecologist, prior to initial site clearance, will enable leverets to be located and flushed out of the area. Any adult hares within the site would also disperse due to the presence of human activity.

8 Residual Effects

8.1 Temporary Construction Effects

8.1.1 The anticipated residual effects for the construction of the base scheme design are described below for those ecological receptors, where a likely significant effect was identified prior to additional mitigation. The assessment below takes into account the additional mitigation measures described above and provides an indication of how the initial potential effects have been reduced.

Brown Hare

8.1.2 The use of RAMs to ensure young leverets are flushed from areas to be cleared will ensure no loss or injury to individuals. Enclosing the work areas with fencing will prevent entrapment in machinery and materials. These measures will ensure the residual effect of construction on brown hare is reduced to **not significant**.

8.2 Longer Term, Operational and Permanent Effects

8.2.1 No longer term, operational and permanent residual effects have been identified for the base scheme design. The consideration of climate change effects on biodiversity are detailed below.

Consideration of Climate Change Effects on Biodiversity

8.2.2 EU guidance (Ref 21-48) requires that EIA considers the effects of projects on climate change and on biodiversity. Although the guidance document treats the two topics as separate issues, it notes that there are interactions between climate change and biodiversity, and advises that assessment of permanent effects of a project, and the mitigation thereof, should take account of climate change projections applicable to the nature and scale of development.

8.2.3 The EU guidance indicates that effects which are only likely to be experienced in the next 20 years should be based on current weather patterns or near-future projections if available and relevant. In relation to biodiversity, all significant effects of the base scheme design are experienced in this timeframe. The assessment of residual effects finds that affected habitats would have been reinstated. However, there are three material considerations pertinent to climate change and biodiversity that the assessment of longer-term effects must take into account.

8.2.4 Firstly, how projects might be assessed in terms of their effects on the 'manageability' of the Natura 2000 network (Ref 21-49). With respect to the base scheme design, no Natura 2000 sites are located within 10 km and no impacts are predicted upon Natura 2000 sites. Therefore the

base scheme design will not contribute to existing pressures on Natura 2000 sites, affect the ability for site managers to maintain dialogue with a range of stakeholders, constrain the possibility of adaptive management plans for the sites themselves, or constrain future monitoring of climate change effects on biodiversity within the sites.

8.2.5 Secondly, the EIA Guidance requires developers to ensure that their designs and mitigation measures are resilient to projected climate change. In this case, the principal mitigation for the construction-phase vegetation removal is prompt reinstatement. The woodland and tree planting, hedgerows and other new landscapes will be planted in accordance with guidance set out by Forestry Commission's UK Forestry Standard concerning Forests and Climate Change (2011) (Ref 21-50).

8.2.6 Thirdly, the EU guidance about assessing the impact of development on the manageability of Natura 2000 sites is transferable to a consideration of the impact on general manageability of biodiversity in the area of the base scheme design. This can be assessed in terms of management of the network of designated sites, bearing in mind Government commitments to maintain SSSIs in favourable condition and for the majority of local wildlife sites to be actively managed. The South Forty Foot Drain LWS is located 0.7 km west of the proposed converter station. No direct or indirect effects of the base scheme design is predicted upon the LWS during construction, operation or decommissioning, taking into account embedded mitigation. The base scheme design will not contribute to existing pressures on this site, and with the creation of the landscape planting scheme around the proposed converter station this will likely have a beneficial effect in enhancing habitats for biodiversity in the local area. No constraints to information-sharing and the ability for site managers to maintain dialogue with a range of stakeholders will occur.

8.2.7 The base scheme design will not constrain the possibility of adaptive management plans for South Forty Foot Drain LWS or for the land immediately around it. However, there are some limitations with respect to associated wayleave agreements which restricts the planting of trees and woodland over the proposed AC cable route. Lastly, the operation of the proposed AC cable and proposed converter station will not constrain future monitoring of climate change effects on biodiversity within South Forty Foot Drain LWS.

8.2.8 Climate change may cause changes in distribution of fauna with certain species moving north as temperatures warm, as is being seen with certain species such as the Dartford warbler. Reinstatement of the watercourse and hedgerow network within the base scheme design will ensure migration corridors are available along which fauna can move.

8.2.9 The potential long-term effects of the base scheme design, taking into account all design and embedded mitigation, have been considered as to whether they are resilient in a changing climate with respect to biodiversity. In summary, the base scheme design would be constructed and reinstated and created habitats re-established within 10 to 15 years of commencement. The replacement habitat designs utilise species which take account of climate change predictions and

therefore the embedded mitigation is likely to be resilient for the operational life of the base scheme design.

8.2.10 Residual implications of climate change on the decommissioning stage are unlikely. Mitigation during decommissioning would reflect that proposed during construction, informed by updated baseline surveys at the time. Licensing, Method Statements and an EcCOW would be employed as appropriate, and as required by the statutory nature conservation body under the terms of any licences or consents required to implement the works.

8.3 Decommissioning Effects

8.3.1 The residual effects of decommissioning will be similar and no worse than those described for construction, following the assessment of current baseline surveys and implementation of the required mitigation.

9 Monitoring

9.1 Construction Phase Monitoring

9.1.1 Prior to construction commencing, an EcCOW will be appointed.

9.1.2 Where required, pre-construction surveys will be undertaken in order to update the baseline and inform the need for measures to ensure legal compliance and licencing with respect to trees with bat roost potential which will be affected by construction activities, water vole and otter and badger.

9.1.3 Where mitigation works are required in advance of the commencement of construction for example, the closure of badger setts under Licence, or translocation of GCN from within Bicker Fen Substation, their implementation and satisfactory completion will be monitored by the EcCOW.

9.1.4 The key role of the EcCoW during construction activities will be to monitor the implementation of habitat and species protection Method Statements, to ensure their legal compliance including but not limited to, protection of trees and other habitats, nesting bird checks, RAMs for amphibians, reptiles and brown hare and ongoing requirements for protected species licences.

9.2 Operational Phase Monitoring

9.2.1 Operational phase monitoring will relate to habitat reinstatement/ landscape planting and any monitoring requirements as a result of licenced works.

9.2.2 The Reinstatement Plan (ES-3-C.01, Chapter 11 Landscape & Visual Amenity) provides detail on monitoring requirements, which include the monitoring of planted trees and hedgerows through the first five years of the operational period.

9.2.3 Other post-construction monitoring will include monitoring of the fencing used to maintain flyways for bats along hedgerows until reinstatement planting is established, and implementation of remedial measures to maintain their integrity.

10 Cumulative Effects

10.1 Inter-project Cumulative Effects

Scope of Inter-project Cumulative Assessment

10.1.1 An inter-project cumulative effect is interpreted as a situation where two or more separate development projects both have the same impact receptor (e.g. loss of woodland habitat) and when both/all of the developments are implemented this would result a more substantial impact on this same receptor.

10.1.2 A long-list of potentially relevant projects/plans considered cumulatively alongside the base scheme design has been summarised in the Cumulative Assessment Chapter (Chapter 29). The assessment of cumulative effects has been based on the assessment completed for the base scheme design set out in this chapter and, where available, the respective planning application documentation prepared for these other projects. This assessment is therefore limited to information that is available for other projects. All the projects listed in the long-list have accompanying planning documentation, although the level of supporting ecological information varies according to the scheme complexity.

10.1.3 Each plan or project on the long-list was appraised on the basis of the project type, status, and temporal and spatial scales involved relevant to the basis scheme design. Additionally, the nature of the development and its positioning has been considered and those projects positioned within the footprints of pre-existing developments or on ecologically poor sites are scoped out in favour of those sited on potentially sensitive or ecologically valuable habitats are included. Professional judgement has been applied in this process.

10.1.4 Based on the above criteria the long-list of plans or projects considered for cumulative impact assessment was reduced to only those where a potential cumulative impact may be anticipated with the base scheme design.

10.1.5 Following preliminary assessment of each project on the long-list, only one project was found to be spatially and temporally relevant to the base scheme design. The onshore elements of the Triton Knoll Offshore Windfarm are, at least partially, located within the zone of influence of the base scheme design and are likely (adopting a reasonable worst case) to have an overlapping construction period with the base scheme design. Consequently, the onshore elements of Triton Knoll have the potential to give rise to cumulative ecological effects in combination with the base scheme design.

10.1.6 None of the other projects on the long-list will give rise to additional or cumulative ecological effects in combination with the base scheme design. Excluding Triton Knoll, the other projects in the long-list are located between 7 km and 53 km from the base scheme design and are therefore not considered spatially relevant. Furthermore, the other projects either do not give rise

to any significant residual ecological effects that would be temporally relevant to the proposed base scheme design or otherwise are not in-themselves temporally relevant to the base scheme design, being already complete or at a stage at which there is unlikely to be any overlap in construction periods.

Inter-project Cumulative Effects

10.1.7 Taking into consideration the spatial and temporal scales involved, the siting and nature of proposals, only one project is assessed to have the potential to give rise to cumulative ecological effects in combination with the base scheme design, this being the onshore elements for the Triton Knoll Offshore Windfarm.

10.1.8 In the absence of mitigation for Triton Knoll onshore elements, there will be temporary hedgerow and ditch loss and temporary habitat losses, disturbance and/or risk of killing water voles, badgers, reptiles and nesting birds. Impacts on bats pre-mitigation was assessed to be negligible in light of embedded mitigation and pre-mitigation impacts on wintering birds and great crested newts were also considered to be negligible. However, approximately 50% of the study area could not be accessed for survey and this therefore creates some uncertainties regarding the magnitude of impacts. Pre-commencement surveys are proposed in those areas that were inaccessible for habitats, GCN, water voles, reptiles, bats and badgers.

10.1.9 Trenchless crossing methods will be employed for the South Forty Foot Drain LWS, rivers and major drains. Open-cut trenching is proposed to be used during the crossing of the majority of the minor field drains/ditches for Triton Knoll. The working corridor would be narrowed to 30 m for open cut ditch crossings where protected species (namely, water voles) are identified. For hedgerow crossings, working widths will again be narrowed to 30 m and cut brash will be placed within the hedgerow breaks to maintain their linear structure and function as ecological corridors. It was agreed with Natural England that water vole exclusion and translocation would not be required for the ditch crossings, but that displacement by habitat manipulation would be implemented for all bankside and fringe vegetation along ditches within the route corridor plus 5 m buffer either side. No GCN were found within 250 m (within the surveyed areas) and only low populations of reptiles were anticipated and consequently RAMs focussing on displacement will be implemented prior to and during construction. No barn owl nests were identified (within the surveyed areas) and RAMs are proposed to avoid disturbance of nesting birds. The placement of cut brash into hedgerow breaks would maintain commuting function for bats and avoidance/RAMs are proposed in the event a bat roost is subsequently identified within 15 m of works. One badger sett may be affected (within the surveyed areas) and RAMs are proposed which include maintaining access between setts and foraging/watering habitats and avoiding entrapment in excavations.

10.1.10 As a worst case scenario, should Triton Knoll and the base scheme design be constructed at the same time, there could be a resulting increase in the magnitude of the impacts identified by the ecological assessments completed for the individual projects.

10.1.11 Taking into account spatial scales and the ecology of those receptors affected by both projects pre-mitigation, a 5 km buffer is considered to be an appropriate precautious distance at which to determine effects upon populations. Similar effects occurring more than 5 km are considered likely to impact separate populations of the species involved and, consequently, would not give rise to significant cumulative effects.

10.1.12 Applying a 5 km buffer to the base scheme design encompasses approximately 5.9 km of the Triton Knoll route, broadly from the A17 at Gibbet Hills to the connection point at Bicker Fen, and includes the new substation to be located north of Bicker Fen (approximately 2.1 km north of the proposed converter station site in the base scheme design). This section of the Triton Knoll scheme affects approximately four hedgerow crossings and in the region of 23 ditch or drain crossings for which open trenching methods are presumed (excluding South Forty Foot Drain LWS, for which trenchless techniques were confirmed). A permanent loss of 21.9 ha of largely arable land will be associated with the new substation. Arable and agriculturally improved grasslands were scoped out as receptors by merit of their nature conservation importance being valued only at the Zone of Influence geographical scale. Accounting for embedded mitigation, residual construction effects would be negligible/minor positive for hedgerows and all other residual construction effects on ecological receptors were assessed to be negligible. No operational ecological effects were predicted on ecological receptors as a consequence of the Triton Knoll scheme.

10.1.13 Within the base scheme design, only six hedgerows will be affected by temporary breaks to facilitate cable trenching. Breaks in hedgerows will be mitigated using embedded measures of temporary fencing to ensure functionality and continuity are retained and hedgerows will be reinstated with new planting on completion. Trenchless crossings for all ditches and drains are proposed for the base scheme design. Accounting for embedded mitigation, residual construction effects of the base scheme design will be negligible and no operational ecological effects are predicted on ecological receptors.

10.1.14 Taking into consideration the embedded and additional mitigation measures for both schemes, were both schemes to be implemented simultaneously the proportional cumulative increase in temporary effects upon hedgerows and watercourses is therefore considered not significant.

10.1.15 Despite the uncertainties in the magnitude of pre-mitigated construction effects upon some protected species arising as a consequence of survey access limitations for Triton Knoll, the negligible cumulative increase in temporary habitat effects that would result should both schemes be constructed simultaneously will not give rise to significant cumulative impacts upon species receptors identified to occupy or utilise those habitats.

10.1.16 Subsequently, there is no requirement for further mitigation and no additional cumulative impacts will arise.

10.2 Intra-project Cumulative Effects

Scope of Intra-project Cumulative Assessment

10.2.1 For the purposes of this assessment, an intra-project cumulative effect is interpreted as a situation where separate elements of the same project i.e. the proposed DC cable route and the proposed converter station, permanent access road and proposed AC cable route have the same impact receptor e.g. local badger population and this would result in a more substantial impact on this same receptor.

10.2.2 In line with the inter-project cumulative assessment a precautious approach is taken and ecologically important features which are common to both the proposed DC cable route (within a 5 km radius of the proposed converter station, permanent access road and proposed AC cable route) and the proposed converter station, permanent access road and proposed AC cable route are considered.

Intra-project Cumulative Effects

10.2.3 Construction of the proposed converter station is anticipated to take 24 to 36 months, while construction activities for the southern section of the proposed DC cable route being considered is likely to be less than this and during the latter part of the proposed converter station construction programme.

10.2.4 In the absence of mitigation on the proposed DC cable route, potential impacts on the ecological features which are in common with the proposed converter station, permanent access road and proposed AC cable comprise temporary habitat loss within drains, disturbance and/or risk of killing GCN, other amphibians, bats, water voles, badgers, breeding birds, reptiles and brown hare. No hedgerows or woodland are present which will be impacted along the proposed DC cable route within the 5 km radius. Taking embedded mitigation into account, bankside habitats within drains will be reinstated following completion of construction, with longer term effects becoming not significant in 2 - 4 years. Embedded legal compliance measures (some requiring an NE licence), and RAMs for GCN, bats, water voles, badgers, reptiles and breeding birds will ensure the risks of disturbance or killing/injury are not significant. RAMs for brown hare will ensure the risks of disturbance or killing/injury are not significant for these species.

10.2.5 Taking into consideration the small sections of watercourses which will be impacted and the embedded mitigation for both elements of the Onshore Scheme, the proportional increase in temporary habitat loss on this habitat given its abundance in the locality is considered to be not significant.

10.2.6 With respect to protected species, the greatest potential for cumulative impacts is likely to be experienced on those species present in close proximity to the proposed converter station where the proposed DC cable route terminates, namely badger, breeding birds, reptiles and brown hare. No cumulative increase in the risks of killing or injury are anticipated due to the implementation of embedded legal compliance measures and embedded or additional RAMs for both elements of the Onshore Scheme. There is the potential for a cumulative increase in temporary disturbance

effects on these species, however it is considered that this will not lead to significant adverse effects given the abundant similar habitats in the locality that individuals can move into.

10.2.7 Overall, it is considered that there is no requirement for further mitigation and no additional intra-project cumulative impacts will arise.

11 Summary of Assessment

11.1 Summary

Overview of Baseline Conditions

11.1.1 No international or national designated sites are located within 10 km of the base scheme design. One locally designated site; South Forty Foot Drain LWS is located within 2 km, 0.7 km to the west of the proposed converter station. One area of NERC Act 2006 (Ref 21-6) S41 habitat of principal importance; coastal and floodplain grazing marsh will be crossed by the proposed AC cable route. However, the Phase 1 habitat survey of this area survey indicated that this land parcel was heavily grazed with a short sward and would be unlikely to support species associated with coastal and floodplain grazing marsh habitat. The predominant habitat within the base scheme design is arable farmland, with field boundaries mainly comprising a network of drainage ditches and occasional hedgerows. Several small patches of relatively young broad-leaved plantation woodland are present along with approximately 18 trees, the majority of which are also relatively young.

11.1.2 A small population of GCN is present within the Bicker Fen Substation based on desktop records from 2015. Small newt, common toad and common frog have been recorded during surveys. One tree with moderate bat roost potential is present within the proposed AC cable route. Low to moderate numbers of bats including common pipistrelle, *Myotis* species, Daubenton's bat and noctule utilise the drainage network, hedgerows and woodland for foraging and commuting. Water voles are present within the pond in the Bicker Fen Substation but surveys have not indicated their presence elsewhere in the base scheme design. Badgers are prevalent across the base scheme area, with several main, subsidiary and outlier setts being present. Land within 500m of the base scheme design is known to support low numbers of wintering birds, with occasional moderate sized flocks of starling, fieldfare and redwing. This area is not used by flocks of wintering wader and wildfowl species. The base scheme design is used by low numbers of farmland passerine bird species characteristic of an open arable habitat which are prevalent within the wider landscape. Grass snake and common lizard have been recorded in the vicinity of the base scheme design and are considered to be present in low numbers. Slow worm is also likely to be present based on habitat suitability. Brown hare has been observed on a number of occasions within the base scheme design area.

Overview of Residual Effects

11.1.3 A summary of the residual effects which occur as a result of construction of the proposed converter station, permanent access road and proposed AC cable route is presented in Table 21.13.

Residual Effects in South Holland District Council

11.1.4 The proposed converter station, permanent access road and half of the proposed AC cable route (1.21 km) are located in South Holland District Council. Residual effects which have been identified in this section relate to brown hare where RAMs will ensure that leverets vacate the area prior to vegetation clearance and reduce potential effects to not significant.

Residual Effects in Boston Borough Council

11.1.5 The northern half of the proposed AC cable route is located within Boston Borough Council (1.13 km). Residual effects which have been identified in this section relate to brown hare where RAMs will ensure that leverets vacate the area prior to vegetation clearance and reduce potential effects to not significant.

Table 21.13 Summary of Assessment: Ecology (Converter Station)				
Description of Receptor	**Value / Sensitivity**	**Description of Residual Effect**	**Significance**	**Significant**
Construction Impacts				
Brown Hare	Local	Use of RAMs to ensure young leverets are flushed from areas to be cleared will ensure no loss or injury to individuals. Certain to ensure no significant residual effects.	**Not significant**	**No**

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