CONTENTS

TABLES

11.0 BIODIVERSITY AND NATURE CONSERVATION

11.1 Introduction

11.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the construction, operation (including maintenance) and decommissioning of the Proposed Development on biodiversity and nature conservation. The assessment considers:

- the present-day and future baseline conditions during construction and at opening;
- the effects of construction of the Proposed Development on nature conservation designations, habitats and species;
- the effects of the operation of the Proposed Development on nature conservation designations, habitats and species; and
- the potential effects of the eventual decommissioning of the Proposed Development.

11.1.2 This chapter is supported by the following technical appendices provided in PEI Report Volume II. These appendices include all biodiversity and nature conservation Figures relevant to this chapter:

- **Appendix 11A** – Legislation and Planning Policy;
- **Appendix 11B** – Ecological Impact Assessment Methodology;
- **Appendix 11C** – Preliminary Ecological Appraisal Report;
- **Appendix 11D** – Confidential Badger Survey Report;
- **Appendix 11E** – Bat Survey Report;
- **Appendix 11F** – Riparian Mammal Survey Report; and
- **Appendix 11G** – Aquatic Macroinvertebrate and Aquatic Plant Survey Report.

11.1.3 The cumulative effects of emissions associated with the Proposed Development and other committed developments in the vicinity are described in **Chapter 19**: Cumulative and Combined Effects.

11.2 Legislation, Planning Policy and Guidance

11.2.1 The ecological impact assessment (EcIA) presented in this chapter has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. A summary is provided below, and further details are provided in **Appendix 11A** (PEI Report Volume II).

Legislation

11.2.2 The following legislation is potentially relevant to the Proposed Development:

- The Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations');
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD);
- Wildlife and Countryside Act 1981 (as amended) (the WCA);
- The Hedgerow Regulations 1997;
- Countryside and Rights of Way (CRoW) Act 2000 (as amended);
- Natural Environment and Rural Communities (NERC) Act 2006 (as amended);
- Protection of Badgers Act 1992 (as amended);
- Animal Welfare Act 2006;
- Wild Mammals (Protection) Act 1996;
- The Eels (England and Wales) Regulations 2009 (as amended);
- Salmon & Freshwater Fisheries Act 1975 (as amended);
- Environmental Protection Act 1990; and
- Marine and Coastal Access Act 2009.

National Planning Policy

National Policy Statements for Energy

11.2.3 The relevant Government policy for delivery of major energy infrastructure is set out in the following two relevant National Policy Statements (NPS).

11.2.4 The Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a) sets out national policy for energy infrastructure. Where the development is subject to EIA, the applicant should ensure that the assessment clearly sets out any effects on international, national and local nature conservation designations, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. It also requires that the Applicant shows how the project has taken advantage of opportunities to conserve and enhance biodiversity conservation interests.

11.2.5 The NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b) requires that where the project is likely to have effects on water quality or resources, the Applicant should undertake an assessment as required in Section 5.15 of NPS EN-1. The assessment should particularly demonstrate that appropriate measures will be put in place to avoid or minimise adverse impacts of abstraction and discharge of cooling water. In addition to the mitigation measures set out in EN-1, design of the cooling system should include intake and outfall locations that avoid or minimise adverse impacts. Specific measures are required to minimise fish impingement and/ or entrainment and excessive heat from discharges to receiving waters.

National Planning Policy Framework

11.2.6 The policies set out in the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019) are also important and relevant matters. The NPPF sets out the Government's planning policies for England and how these are expected to be applied, and it identifies overarching environmental objectives such as protecting and enhancing our natural environment and improving biodiversity. The NPPF introduces additional considerations including definitions of and requirements in relation to irreplaceable habitats which must be addressed in the development design and assessment process. Further information on the relevant parts of the NPPF is provided within **Appendix 11A** (PEI Report Volume II).

Local Planning Policy

11.2.7 The Proposed Development is located in North Lincolnshire Council. Therefore, the following planning policies are potentially relevant to the Proposed Development:

- Policy CS17 of the North Lincolnshire Council Local Development Framework Core Strategy adopted 2011 (North Lincolnshire Council, 2011), which sets out requirements to achieve effective stewardship of the biodiversity of North Lincolnshire;
- Saved Policies LC1, 2, 3, 4, 5, 6 and 12 of the North Lincolnshire Local Plan adopted 2003 (North Lincolnshire Council, 2003a), which set out requirements in regard to nature conservation designations, species and habitats; and
- Policies ECO1, ECO2, BIO1, BIO2 and MPA1 of the Eastern Inshore Marine Plan (Marine Management Organisation, 2014), which sets out requirements in regard to cumulative impacts affecting the ecosystem of the Marine Plan and adjacent marine and terrestrial areas, releases of hazardous substances, protection and enhancement of biodiversity, and requirements to address strategic objectives for maintenance of an ecologically coherent network.

11.2.8 Further information on the above relevant policies is provided within **Appendix 11A** (PEI Report Volume II).

Other Guidance

11.2.9 Additional guidance of potential relevance to the Proposed Development and/ or for interpretation of the above planning policy is given in the following documents:

- North Lincolnshire Supplementary Planning Guidance (SPG) 3: Design in the Countryside, which sets out additional considerations in relation to landscape plantings and biodiversity protection and enhancement (North Lincolnshire Council (2003b);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Department for Environment, Food and Rural Affairs (Defra), 2011);
- Lincolnshire Biodiversity Action Plan (Lincolnshire Biodiversity Partnership, 2011);

- Standing Advice issued by Defra, Natural England and the Forestry Commission; and
- National Character Area Profile 39 (NE339): Humberhead Levels (Natural England, 2014).

11.3 Assessment Methodology and Significance Criteria

Consultation

11.3.1 The consultation undertaken with statutory consultees to inform this chapter, including a summary of comments raised via the formal scoping opinion (**Appendix 1B** of PEI Report Volume II), is summarised in Table 11.1.

Table 11.1: Consultation summary table

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
Planning Inspectorate	Scoping opinion (June 2020)	The ES should assess vibration impacts to ecological receptors where significant effects are likely to occur.	Potential noise and vibration impacts are considered and assessed (where relevant) with reference to the findings of **Chapter 9**: Noise and Vibration
		The ES should detail how the baseline has been established within an appropriate study area and include a list of sources used and/or the location, extent, data and results of any surveys undertaken to inform the baseline, supported by figures where appropriate. Effort should be made to agree the approach with relevant consultation bodies.	The approach to be taken was set out in the scoping report reviewed and commented on by stakeholders for the scoping opinion. Further detail to meet the requirements of the Planning Inspectorate is provided in this chapter and its supporting technical appendices.
		The ES should establish an appropriate study area based on the ZOI, and the assessment should include all potential sensitive receptors within the ZOI and assess all impacts that are likely to cause significant effects.	This is provided in this chapter and its supporting technical appendices.

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		The ES should assess air quality impacts on ecology (e.g. nitrogen deposition).	Potential air quality impacts are considered and assessed (where relevant) with reference to the findings of **Chapter 8**: Air Quality.
		The Inspectorate notes that spatial extent, probability and frequency should also be considered in determining impacts in the ES. The ES Ecology Chapter should include a methodology determining how significance is defined with reference to applicable guidance used to inform the assessment. Effort should be made to agree the approach with the relevant consultation bodies.	The scoping report identified that assessment would be made in accordance with current guidance, including CIEEM (2019) methods. This approach was reviewed and commented on by stakeholders for the scoping opinion. The methods used are provided in this chapter and its supporting technical appendices.
		Where piling is required, the ES should assess potential impacts from piling on ecological receptors.	Potential piling impacts have been considered based on the details of this provided in **Chapter 5**: Construction Programme and Management and are assessed (where relevant) with reference to the preliminary findings reported within **Chapter 9**: Noise and Vibration, and **Chapter 12**: Water Resources and Flood Risk.
		The ES should assess potential impacts from dredging on receptors.	It is not currently envisaged that dredging will be required. Should the need for dredging be identified, the potential dredging impacts would be reported in the ES.

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		Dependent on the timing footprint and nature of the works, further sediment sampling may be required closer to the commencement of the works and this should include for metal samples, Polyaromatic Hydrocarbons (PAHs) and Organochlorides (OCs). Effort should be made to agree an approach to sediment sampling with the MMO and any other relevant consultation bodies.	This is not a matter for the ecological assessment, and instead is addressed in **Chapter 12**: Water Resources and Flood Risk.
		The Inspectorate is content to scope out great crested newt surveys subject to evidence of the agreed approach with Natural England.	Natural England was consulted for the scoping opinion and had the opportunity to review the rationale for scoping out great crested newt. No comments in relation to this were made. Appropriate consideration has been given to great crested newt and it has been scoped out with reference to an appropriate evidence base. The requirements of good practice have been met.
		The ES should determine whether the Proposed Development could impact any nearby buildings based on the ZOI and whether these have bat roost potential. The ES should assess impacts to bat roosts where significant effects are likely to occur.	This has been considered. Construction will not affect any existing buildings and no demolition is proposed. Further detail is provided in **Appendix 11C**: Preliminary Ecological Appraisal Report (PEI Report Volume II).

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		The Inspectorate notes that the ZOI and works to be carried out are currently unknown and it is unclear whether these species could still be impacted. Therefore, the Inspectorate does not agree with scoping out these surveys and advises that the ES should assess impacts to these receptors where significant effects are likely to occur.	The required information is provided in this chapter and its supporting technical appendices.
		The Inspectorate does not agree to scope out aquatic surveys from the ES due to inadequate detail on what construction works are proposed in the aquatic environment. The ES should be informed by suitably detailed and up to date aquatic information to establish a robust and up to date aquatic ecology baseline. The ES should detail surveys conducted and the results. The construction activities associated with the Proposed Development should be included in the ES and any impacts to aquatic receptors where significant effects are likely to occur should be assessed. Effort should be made to agree the approach with relevant consultation bodies.	An appropriate suite of aquatic biodiversity surveys has been completed to enable assessment of the Proposed Development. These surveys were scoped after first considering existing data sources and reasonable assumptions on the presence/ absence of relevant aquatic species. Further detail is provided in **Appendix 11C**: Preliminary Ecological Appraisal Report and **Appendix 11G**: Aquatic Macroinvertebrates and Aquatic Plant Survey Report.
		The ES should clearly set out whether terrestrial and aquatic ecology are assessed as one or two aspects and identify which receptors are assessed within each Chapter; cross-	The EcIA presented in this chapter considers all terrestrial, freshwater and marine ecological features of potential relevance to the Proposed Development as

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		referencing should be employed to enable understanding and effort should be made to agree an approach with relevant consultation bodies.	described in **Chapter 4**: Proposed Development.
Natural England	Scoping opinion (10th June 2020)	Advice provided on the scope of the EIA.	This chapter is consistent with the guidance provided in relation to biodiversity and nature conservation.
Environment Agency	Scoping opinion (12th June 2020)	Comment that water vole surveys undertaken in June 2019 identified an extensive water vole population in the drainage ditches surrounding the site. The ES should include an understanding of the water vole population and a mitigation strategy to prevent its fragmentation. Comment that grass snakes were also recorded during surveys of June 2019 and the EA expect implementation of avoidance measures to safeguard reptiles that come onto site. These measures will be documented in a reptile method statement.	Potential impacts on water vole and grass snake have been considered, and relevant mitigation is identified in this chapter to address these species. The results of the 2019 surveys will be considered further, once received.
		The EA advises that any water abstraction will require fish screening to protect all species, especially designated species (e.g. lamprey and eel). Discharge water will be within UK TAG guidance	The Proposed Development will provide appropriate eel and fish screening as described in **Chapter 4**: The Proposed Development. Assessment of discharge waters is ongoing to demonstrate compliance with UK TAG. This assessment will be provided with the Application, but it should

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
			be assumed that all legal and regulatory requirements will be met.
		Opportunities to incorporate biodiversity in and around development are encouraged. An assessment of the impact of the development on the terrestrial habitat, hedgerows and river corridor categories should be made in the ES. The Defra Biodiversity Metric 2.0 can be used to calculate at least 10% net gain in each of the impacted categories.	Proposals for biodiversity enhancement, compliant with relevant planning policy, will be provided in the Application following consultation with relevant stakeholders to determine appropriate site-specific requirements. All relevant ecological features are assessed within this chapter with reference to the baseline conditions defined in the supporting appendices.
MMO	Scoping opinion (15th June 2020)	The MMO notes that aquatic surveys must not be scoped out of this assessment at this stage. More specificity on the types of surveys to be undertaken is required. The need for surveys should be reviewed based on whether any rare or designated aquatic species have been found in the vicinity of the project.	It is confirmed that a relevant suite of aquatic surveys has been completed. All scoping decisions taken are fully explained in **Appendix 11C**: Preliminary Ecological Appraisal (PEI Report Volume II).
		Expects the ecology chapter included as part of the ES to provide justification for receptors scoped in or out of the review.	This is provided in this chapter and its supporting technical appendices, particularly **Appendix 11C**: Preliminary Ecological Appraisal Report (PEI Report Volume II).
		Recommends details on temporary and permanent impacts to aquatic habitats be included in the ES. The ES should consider effects of thermal uplift and chemical alteration	This is provided in this chapter based on the baseline conditions defined in its supporting technical appendices. **Chapter 12**: Water Resources and Flood

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		specifically against fish receptors. The MMO also expects the ES to include species-specific assessments for species of conservation importance.	Risk presents the preliminary findings and is accompanied by **Appendix 12A**: Water Framework Directive Screening Assessment in PEI Report Volume II. Assessment of thermal uplift and chemical alteration of relevant watercourse is ongoing and will be provided with the Application to demonstrate that legal and regulatory requirements can be met.
North Lincolnshire Council	Late response to scoping opinion (26th June 2020)	Supports the proposed scope of the ecological assessment. Notes that appropriate surveys have been or will be carried out. Use of survey data from 2017 is broadly acceptable as long as it remains reliable.	No response required.
Canal and River Trust	Scoping opinion (5th June 2020)	Identify scope for biodiversity enhancement next to the canal to provided screening from the Proposed Development.	Proposals for biodiversity enhancement suitable to comply with relevant planning policy will be provided in the Application following consultation with relevant stakeholders to determine appropriate site-specific requirements.

Assessment Methods

11.3.2 The EcIA detailed in this chapter has been undertaken in accordance with best practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2019). Full details of the approach applied are provided in **Appendix 11B** (PEI Report Volume II), with an abridged overview provided below. The aims of the EcIA are to:

- identify relevant biodiversity and nature conservation features (i.e. designated sites, habitats, species or ecosystems) which may be impacted as a consequence of the Proposed Development. EcIA can also encompass

geological features but this is not within the scope of this chapter (instead refer to **Chapter 13**: Geology, Hydrogeology and Land Contamination, PEI Report Volume I);

- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national and local policies relevant to nature conservation and ecological, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out what steps would be taken to adhere to legal requirements relating to the relevant biodiversity and nature conservation features concerned.

11.3.3 The principal steps involved in the CIEEM approach can be summarised as:

- biodiversity and nature conservation that are both present and might be affected by the Proposed Development are identified (both those likely to be present at the time works begin, and for the sake of comparison, those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions (this is provided in **Appendices 11C to 11G** (PEI Report Volume II));
- the importance of the identified biodiversity and nature conservation features is evaluated to place their relative nature conservation value into geographic context, and this is used to define the relevant features that need to be considered further within the impact assessment process (this is provided in **Appendices 11C to 11G** (PEI Report Volume II));
- the changes or perturbations predicted to result as a consequence of the Proposed Development (i.e. the potential impacts), and which could potentially affect relevant biodiversity and nature conservation features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are considered;
- the likely effects (beneficial or adverse) on relevant biodiversity and nature conservation features are then assessed, and where possible quantified;
- measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on biodiversity and nature conservation features are also included;
- any residual effects of the Proposed Development are reported; and
- scope for ecological enhancement is considered.

11.3.4 It is not necessary in the assessment to address all habitats and species with potential to occur, and instead the focus should be on those that are 'relevant'. CIEEM (2019) makes clear that is no need to *"carry out detailed assessment of*

ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable". This does not mean that efforts should not be made to safeguard wider biodiversity, and requirements for this have been considered. National policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.

11.3.5 To support focussed EcIA there is a need to determine the scale at which the relevant biodiversity and nature conservation features identified through the desk studies and field surveys undertaken for the Proposed Development are of value (this is provided in **Appendices 11C to 11G** (PEI Report Volume II)). The value of each relevant ecological feature has been defined with reference to the geographical level at which it matters. The frames of reference used for this assessment, and based on CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (East Midlands);
- County (Lincolnshire);
- District (North Lincolnshire);
- Local (features that do not meet criteria for valuation at a District or higher level, but that have sufficient value at the site level to merit retention or mitigation); and
- Negligible (common and widespread features that have very low value at the site level and which do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status, or to deliver wider relevant biodiversity objectives).

11.3.6 In line with the CIEEM guidelines the terminology used within the EcIA draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of the EcIA these terms are defined as follows:

- impact – actions resulting in changes to an ecological feature. For example, demolition activities leading to the removal of a building utilised as a bat roost; and
- effect – outcome resulting from an impact acting upon the conservation status or structure and function of an ecological feature. For example, killing/ injury of bats and reducing the availability of breeding habitat as a result of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

11.3.7 When describing potential impacts (and where relevant the resultant effects) consideration is given to the following characteristics likely to influence this:

- beneficial/ adverse - i.e. is the change likely to be in accordance with nature conservation objectives and policy:

- beneficial (i.e. positive) - a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value;
- adverse (i.e. negative) - a change that reduces the quality of the environment. e.g. destruction of habitat or increased noise disturbance;
- magnitude - the 'size', 'amount' or 'intensity' of an impact - this is described on a quantitative basis where possible;
- spatial extent - the spatial or geographical area or distance over which the impact/ effect occurs;
- duration - the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
- reversibility - i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and enforceable. A permanent effect is one from which recovery is either not possible, or cannot be achieved within a reasonable timescale (in the context of the feature being assessed); and
- timing and frequency - i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons.

Extent of Study Area

11.3.8 The study areas used in this assessment were defined with reference to the likely zone of influence over which the Proposed Development may have potential to result in significant effects on relevant biodiversity and nature conservation features. It is important to recognise that the potential zone of influence of the Proposed Development may vary over time (e.g. the construction zone of influence may differ from the operational zone of influence) and/ or depending on the individual sensitivities of the relevant features.

11.3.9 This was considered when defining relevant study areas, and these are sufficient to address the potential worst-case zone of influence of the Proposed Development on the relevant biodiversity and nature conservation features concerned. The extent of the study areas applied during the desk study and field surveys are detailed within Tables 11.2 and 11.3. In many cases, the actual likely zone of influence of the Proposed Development once designed will be much less than the precautionary area considered when conducting the original desk studies and field surveys for the Proposed Development (see **Appendices 11C to 11G**, PEI Report Volume II).

Significance Criteria

11.3.10 For each relevant biodiversity and nature conservation feature, only those characteristics relevant to understanding the effect and determining the significance are described. The determination of the significance of effects has been made based

on the predicted effect on the structure and function, or conservation status, of relevant biodiversity and nature conservation features, as follows:

- not significant - no effect on structure and function, or conservation status; and
- significant - structure and function, or conservation status is affected.

11.3.11 For significant effects (both adverse and beneficial) this is qualified with reference to the geographic scale at which the effect is significant (e.g. an adverse effect significant at a national level).

11.3.12 The CIEEM approach described in **Appendix 11B** (ES Volume II) broadly accords with the EIA methodology described in **PEI Report Chapter 2**: Assessment Methodology. However, the matrix has not been used to classify effects as this would deviate from CIEEM guidance. In order to provide consistency of terminology in the final assessment, the findings of the CIEEM assessment have been translated into the classification of effects scale used in other chapters of the PEI Report as outlined in Table 11.2.

Table 11.2: Relating CIEEM assessment terms to those used in other PEI report chapters

Effect classification terminology used in other PEI Report chapters		Equivalent CIEEM assessment
Significant (beneficial)	Major beneficial	Beneficial effect on structure/ function or conservation status at regional, national or international level.
	Moderate beneficial	Beneficial effect on structure/ function or conservation status at County level.
Non-significant	Minor beneficial	Beneficial effect on structure/ function or conservation status at Site or Local level.
Non-significant	Neutral	No effect on structure/ function or conservation status.
Non-significant	Minor adverse	Adverse effect on structure/ function or conservation status at Site or Local level.
Significant (adverse)	Moderate adverse	Adverse effect on structure/ function or conservation status at County level.
	Major adverse	Adverse effect on structure/ function or conservation status at regional, national or international level.

Data Sources

11.3.13 The biodiversity and nature conservation baseline has been determined through a combination of desk study and field survey, as described in **Appendices 11B to 11G** (PEI Report Volume II) and as summarised below.

Desk Study

11.3.14 A desk study was carried out to identify nature conservation designations, protected and notable habitats and species potentially relevant to the Proposed Development. The desk study was carried out using the data sources detailed in Table 11.3 and is reported in detail in the Preliminary Ecological Appraisal (PEA) report provided as **Appendix 11C** (PEI Report Volume II).

11.3.15 The desk study was also carried out using the data sources detailed in Table 11.3. Protected and notable habitats and species are taken to include those listed under Schedules 1, 5 and 8 of the WCA; Schedules 2 and 5 of the Habitats Regulations; species and habitats of principal importance for nature conservation in England listed under section 41 (s41) of the NERC Act; and other species that are Nationally Rare, Nationally Scarce or listed in national or local Red Data Lists and Biodiversity Action Plans.

11.3.16 Records of plant Invasive Non-native Species INNS), as listed under Schedule 9 of the WCA and Schedule 2 of the Invasive Alien Species (Enforcement and Permitting) Order 2019, and other relevant INNS were also collated and have been considered when assessing the potential ecological effects of the Proposed Development. It would not be appropriate to attribute the same weight to these non-native species as has been applied to relevant biodiversity and nature conservation features when determining the likely significant effects of the Proposed Development, as the presence of such species is generally detrimental for ecology, and conversely the removal of such species would usually be considered desirable and beneficial for ecology.

11.3.17 The need to control the movement and establishment of INNS is driven by the requirements of relevant legislation, as well as the wider implications of the species concerned e.g. their potential to damage or impede operation of the Proposed Development. Therefore, while the invasive species concerned are not relevant features for the purposes of EcIA, there is still a need to consider them in terms of their potential:

- relevance to the delivery of compliance with biodiversity and nature conservation legislation (including potential implications from a necessary use of chemical anti-fouling treatments to treat the water supply);
- to contribute to the amplification of any adverse effects arising from the Proposed Development; or
- to conflict with objectives for ecological mitigation, compensation and enhancement.

Table 11.3: Desk study area and data sources

Type of ecological feature Title	Desk study area	Data sources
International nature conservation designations e.g. SAC, Special Protection Area (SPA), Ramsar site	15km	Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) (accessed February 2020)
National statutory nature conservation designations e.g. Site of Special Scientific Interest (SSSI)	15km	MAGIC website (accessed February 2020)
Local statutory and non-statutory nature conservation designations (biodiversity) e.g. Local Nature Reserve (LNR), Local Wildlife Site (LWS), Site of Importance for Nature Conservation (SINC), ancient woodland	2km	Lincolnshire Environmental Records Centre (LERC) (data received February 2020)
Protected and notable habitats and species[1]	1km	LERC (data received February 2020) Previous ecological survey information for the former Keadby Ash Tip collected by AECOM in 2017. This information covers: • habitats; • protected and notable flora; and • protected and notable fauna: great crested newt, reptiles, badger, bats, water vole, otter, breeding birds, terrestrial invertebrates and aquatic invertebrates. Previous ecological survey information covering the Proposed Development Site and adjacent land contained within reports to the Applicant for Keadby 2 Power Station and Keadby Wind Farm.

[1] Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the WCA; Schedules 2, 4 and 5 of The Habitats Regulations; and species and habitats of Principal Importance for nature conservation in England listed under Section 41 of the NERC Act. Records of non-native controlled weed species were also collated; such species are listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Type of ecological feature Title	Desk study area	Data sources
		The Environment Agency Ecology and Fish Explorer Database (accessed May 2020)
Ancient and veteran trees	1km	LERC (data received February 2020) Ancient tree inventory website (https://ati.woodlandtrust.org.uk/tree-search) (accessed July 2020)

Field Surveys

11.3.18 The scope of works for necessary habitat and protected species surveys was determined and confirmed through Phase 1 Habitat survey and PEA as described in **Appendix 11C**: Preliminary Ecological Appraisal Report (PEI Report Volume II).

11.3.19 The scope of the field surveys completed to inform the EcIA, described in **Appendix 11C** (PEI Report Volume II), is summarised in Table 11.4 below. Full details of the scope and methods for each survey are provided in the technical **Appendices 11C to 11G** (PEI Report Volume II), as cross referenced in Table 11.4.

Table 11.4: Ecological field surveys defining the baseline for the Proposed Development

Ecological survey	Appendix (PEI Report Volume II)	Scope of survey	Survey date
Habitat	11C (main report)	Phase 1 Habitat survey of land within the Proposed Development Site and immediately adjacent.	Completed 15th July 2020
Botanical (terrestrial)	11C (Annex 11E)	National Vegetation Classification (NVC) and detailed botanical appraisal of notable acid grasslands and Open Mosaic Habitats (OMH) with the former Keadby Ash Tip	Completed 17th July 2017, re-verified by original specialist surveyor 15th July 2020
Botanical (aquatic)	11C (Annex 11E) 11G	Aquatic macrophyte surveys of relevant watercourses.	Completed 17th July 2017 (Keadby Ash Tip) and 15th July 2020 (other watercourses)

Ecological survey	Appendix (PEI Report Volume II)	Scope of survey	Survey date
Aquatic invertebrates	11C (Annex 11E) 11G	Aquatic macroinvertebrate surveys of relevant watercourses.	Completed 17th July 2017 (Keadby Ash Tip), 19th May 2020 (Keadby Common drains) and 14th July 2020 (Stainforth and Keadby Canal)
Badger	11D (confidential)	Suitable habitat for badger within 50 m of the Proposed Development Site.	Completed 22nd April 2020 with supplementary inspection 15th July 2020
Bats – roost appraisal	11C	Inspection of all suitable trees (no relevant buildings or structures) within the Proposed Development Site.	Completed 22nd April 2020
Bats – activity surveys	11E	Walked transects in spring, summer and autumn to record and map bat activity in association with Keadby Common and Ash Tip. Coinciding periods of remote static detector deployment (five nights minimum per period).	Completed 5th October 2020
Breeding birds	11C (Annex 11H)	Five walked transects to record evidence of breeding within the former Keadby Ash Tip.	Completed 9th June 2017
Reptiles	11C (Annex 11F)	Artificial refuge survey with a minimum of seven visits for presence/ absence undertaken. Suitable habitats in the former Keadby Ash Tip.	Completed 3rd July 2017, habitat suitability re-verified 22nd April 2020
Riparian mammals (water vole and otter)	11F	Early (spring) and late (summer) season surveys of relevant watercourses within and adjacent to the Proposed Development Site boundary.	Completed 12th August 2020, with a top-up survey to address red line changes completed 20th October 2020

Ecological survey	Appendix (PEI Report Volume II)	Scope of survey	Survey date
Terrestrial invertebrates	11C (Annex 11G)	Scoping visit by specialist to undertake habitat appraisal to identify key areas for targeted survey. Follow-up survey visit as advised based on habitat appraisal.	Completed 25th July 2017, re-verified by original specialist surveyor 15th July 2020

Use of the Rochdale Envelope

11.3.20 For the purposes of the ecological impact assessment (EcIA) it is assumed that the majority of the Proposed PCC Site and associated laydown areas would be cleared, no matter what the final sizing and layout of the structures is. The Rochdale Envelope parameters (i.e. the maximum parameters for the Proposed Development and its main structures) therefore do not alter the parameters of the assessment of construction (or decommissioning) impacts on ecology, as they are by definition worst-case.

11.3.21 For the assessment of air quality impacts during operation (and thereby the effects reported on ecological receptors in this chapter), the worst-case stack heights and stack locations has been assessed as described in **Chapter 8**: Air Quality. The assessment of operational impacts presented in this chapter is therefore also based upon a worst-case.

11.3.22 **Chapter 9**: Noise and Vibration assesses a worst-case i.e. the maximum parameters for the Proposed Development and in particular its main buildings and structures) during operation and also includes a construction noise and vibration assessment based on the worst-case assumption of activities occurring at the closest part of the Proposed Development Site to each receptor. Where relevant, the assessment of potential noise and vibration disturbance impacts presented in this chapter is therefore also based on a worst-case.

11.3.23 Given the above, no further discussion of the Rochdale Envelope parameters is provided in this chapter.

11.4 Baseline Conditions

Existing Baseline

11.4.1 The biodiversity and nature conservation features relevant to the Proposed Development are summarised in this section. Details of the findings of desk and field-based studies, including evaluation of the relative nature conservation value of identified features is provided in **Appendices 11C to 11F** (PEI Report Volume II). These appendices should be referred to where more information is required on the grounds for scoping features in and out of impact assessment.

International and National Statutory Nature Conservation Designations

11.4.2 There are six international and 23 national statutory nature conservation biodiversity and nature conservation designations within the study area relevant to the EcIA of the Proposed Development (as defined in **Appendix 11C,** PEI Report Volume II). Most of these designations are located at distance from the Proposed Development Site but have been scoped in at this stage to meet good practice requirements for the assessment of potential operational air quality impacts and effects, as set out in **Chapter 8**: Air Quality (PEI Report Volume I).

11.4.3 The relevance of the identified international and national nature conservation designations to the Proposed Development is summarised below in Table 11.5 (in sequence nearest to furthest) based on the initial screening and rationale provided in **Appendix 11C** (PEI Report Volume II).

Table 11.5: Relevant international and national conservation designations

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
Humber Estuary Ramsar site	✓	✓	✓	Applies to the River Trent which is the location of the Potential River Water Abstraction and Discharge Options and the Waterborne Transport Off-loading Area. 1.3km east of the Main Site (i.e. the source of operational emissions to air).
Humber Estuary SAC	✓	✓	✓	As above
Humber Estuary SSSI	✓	✓	✓	As above
Crowle Borrow Pits SSSI	x	✓	x	2.8km south-west of Main Site
Hatfield Chase Ditches SSSI	x	✓	x	3.3km south-west of Main Site

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
Eastoft Meadow SSSI	x	✓	x	3.6km north-west of Main Site
Thorne and Hatfield Moors SPA	x	✓	x	6.0km north-west of Main Site
Thorne Moor SAC	x	✓	x	6.0km north-west of Main Site
Thorne, Crowle and Goole Moors SSSI	x	✓	x	6.0km north-west of Main Site
Humberhead Peatlands NNR	x	✓	x	6.0km north-west of Main Site
Belshaw SSSI	x	✓	x	7.7km south-west of Main Site
Risby Warren SSSI	x	✓	x	9.0km north-east of Main Site
Humber Estuary SPA	x	✓	x	9.7km north-east of Main Site
Epworth Turbary SSSI	x	✓	x	9.8km south-west of Main Site
Messingham Heath SSSI	x	✓	x	9.9km south-east of Main Site
Hatfield Moors SSSI	x	✓	x	10.3km south-west of Main Site
Hatfield Moors SAC	x	✓	x	10.3km south-west of Main Site
Tuetoes Hills SSSI	x	✓	x	10.4km south-east of Main Site
Messingham Sand Quarry SSSI	x	✓	x	11.9km south-east of Main Site
Haxey Turbary SSSI	x	✓	x	11.9km south-west of Main Site
Rush Furlong SSSI	x	✓	x	11.9km south of Main Site
Manton and Twigmoor SSSI	x	✓	x	12.1km south-east of Main Site

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
Scotton and Laughton Forest Ponds SSSI	x	✓	x	12.3km south-east of Main Site
Hewson's Field SSSI	x	✓	x	12.7km south-east of Main Site
Broughton Far Wood SSSI	x	✓	x	13.6km east of Main Site
Broughton Alder Wood SSSI	x	✓	x	13.8km east of Main Site
Scotton Beck Fields SSSI	x	✓	x	13.8km south-east of Main Site
Scotton Common SSSI	x	✓	x	14.0km south-east of Main Site
Laughton Common SSSI	x	✓	x	14.3km south of Main Site

Local Nature Conservation Designations, Including Nature Improvement Areas and Ancient Woodland

11.4.4 There are 11 local non-statutory nature conservation designations within the study area relevant to the EcIA of the Proposed Development (as defined in PEI Report **Appendix 11C**). These designations are all of county nature conservation value.

11.4.5 In addition, the Proposed Development is located within a landscape identified as the Humberhead Levels Nature Improvement Area (NIA). It is one of 12 NIA chosen by the Government to create joined up and resilient ecological networks at a landscape scale

11.4.6 There are no statutory LNR or ancient woodlands in the study area.

11.4.7 The relevance of the identified non-statutory nature conservation designations to the Proposed Development is summarised below identified in Table 11.6 (in sequence nearest to furthest) based on the initial screening and rationale provided in **Appendix 11C** (PEI Report Volume II).

Table 11.6: Relevant local nature conservation designations

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
Keadby Warping Drain LWS	x	✓	x	0.3km north of Main Site. Crossed by the buried pipeline for the existing line of discharge from Keadby 1 Power Station, but no construction works proposed.
Stainforth and Keadby Canal Corridor LWS	✓	✓	✓	The Potential Canal Water Abstraction Option (if used) is located on the banks of, and would take water from, the LWS. 0.5km south-east of Main Site.
Hatfield Waste Drain LWS	✓	x	✓	Crossed by the proposed highway improvement works option at the Proposed Development Site entrance of A18.
Keadby Boundary Drain LWS	✓	✓	✓	Located adjacent to (and west of) and downstream of Main Site
North Engine Drain, Belton LWS	✓	x	✓	10m south of the proposed highway improvement works option at the Proposed Development Site entrance of A18

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
River Torne LWS	✓	x	✓	20m south of the proposed highway improvement works option at Proposed Development Site entrance of A18
South Soak Drain, Keadby LWS	✓	✓	✓	30m south-east of the Potential Canal Water Abstraction Option on the Stainforth and Keadby Canal. 0.5km south-east of Main Site.
Keadby Wetland LWS	✓	✓	✓	30m south-east of the Potential Canal Water Abstraction Option on the Stainforth and Keadby Canal. 0.6km south-east of Main Site.
Keadby Wet Grassland LWS	✓	✓	✓	50m south-east of the Potential Canal Water Abstraction Option on the Stainforth and Keadby Canal. 0.7km south east of Main Site.
Three Rivers LWS	x	✓	x	1km south of Main Site
South Engine Drain LWS	✓	x	✓	0.1km south of the proposed highway improvement works option at the Proposed Development Site entrance of A18

Protected and Notable Habitats

11.4.8 Protected and notable habitats located within the boundaries of nature conservation designations are assessed in relation to those designations and are not duplicated within this section.

11.4.9 The semi-natural habitats present within the Proposed Development Site are summarised below in Table 11.7 and mapped on **Figures 11C.3** and **11C.4** (**Appendix 11C**, PEI Report Volume II), along with identification of whether or not the land they occupy would be required for the construction, operation and/ or decommissioning of the Proposed Development. These habitats are described in more detail, and their nature conservation value qualified further, in **Appendix 11C** (PEI Report Volume II). Relevant aquatic habitats are also covered in detail within **Appendix 11G** (PEI Report Volume II).

11.4.10 All habitats of local or higher value within the Proposed Development Site, as identified in Table 11.7, are taken forward for impact assessment where there is potential for these to be adversely affected. Retained habitats, including those within the Keadby 1 Power Station and Keadby 2 Power Station complex and along the alignment of the proposed Water Connection Corridors, are not assessed further as none are relevant to the EcIA.

11.4.11 Other habitats within the 1km study area for this EcIA (as defined in Table 11.3) are only assessed further where they are of sufficiently high biodiversity and nature conservation value (as defined in **Appendix 11C** - PEI Report Volume II) that assessment of potential indirect impacts and effects is appropriate, after first considering typical good practice requirements for air and water quality impact assessment as defined in **Chapter 8**: Air Quality and **Chapter 12**: Water Resources and Flood Risk (PEI Report Volume I) respectively. Accordingly, the OMH and acid grassland habitat of national nature conservation value within the former Keadby Ash Tip (see **Appendix 11C**) adjacent to the Proposed Development Site is taken forward for impact assessment.

Table 11.7: Summary of the undesignated semi-natural habitats present within and adjacent to the Proposed Development Site

Habitat	Value	Area (ha)/ Length (km)	Relevant to the EcIA
Within the Proposed Development Site			
Amenity grassland	Negligible	1.1ha	No - screened out based on value and location (no impact)
Arable farmland	Negligible	17.3ha	No - screened out based on value
Ephemeral/ short perennial vegetation	Negligible	3.2ha	No - screened out based on value
Hedgerows	Local	1.4km	No - screened out based on location (no impact)

Habitat	Value	Area (ha)/ Length (km)	Relevant to the EcIA
Improved grassland	Negligible	10.9ha	No – screened out based on value
Neutral semi-improved grassland	Negligible	12.5ha	No - screened out based on value
Plantation broad-leaved woodland	Local	0.8ha	No - screened out based on location (no impact)
Scrub (dense and scattered)	Local	0.8ha	Yes - within land required for construction and temporary laydown
Watercourse: drains and canal	Up to county	2.0km	Yes - within land required for construction of the Main Site and the Emergency Vehicle Access Road
Adjacent to the Proposed Development Site (relevant habitats only, see main text)			
Acid grassland	National	7.9ha	Yes – relevant to operational air quality assessment
OMH	National	15.4ha	Yes – relevant to operational air quality assessment

Protected and Notable Species

11.4.12 Protected and notable species potentially relevant to this EcIA are summarised below in Table 11.8, based on a more detailed review of relevant species provided in **Appendix 11C** (PEI Report Volume II). The identification of relevant species is described in more detail, and their nature conservation value qualified further in **Appendices 11C** to **11G** (PEI Report Volume II). Generally, only confirmed species of local or higher value (as identified in Table 11.8) are taken forward for impact assessment, although some consideration is also given to species that may establish in the future as well as INNS of plants and animals. Species that are designated features of interest of nature conservation designations are assessed in relation to those designations and are not duplicated within this section.

Table 11.8: Summary of species relevant to the ecological impact assessment

Species	Value	Location of baseline information (PEI Report Volume II)	Potential Relevance to the EcIA
Badger	-	Confidential **Appendix 11D**	See Confidential **Appendix 11D**.

Species	Value	Location of baseline information (PEI Report Volume II)	Potential Relevance to the EcIA
Bats (foraging)	Local	**Appendix 11E**	Construction and operation of Main Site. May be relevant at decommissioning stage also, depending on methods and future baseline.
Breeding birds	Local to county	**Appendix 11C**, **Annex 11D**	Construction, particularly of Main Site. May be relevant at decommissioning stage also, depending on methods and future baseline.
Fish	Up to regional (for migratory species)	**Appendix 11C**	Construction and operation of Proposed River and Canal Water Abstraction options and Discharge Corridor. May be relevant at decommissioning stage also, depending on methods and future baseline.
Flora (notable species)	Regional	**Appendix 11C**, Annex 11E	Dependent on habitats and habitat conditions potentially sensitive to ammonia and nitrogen deposition during operation.
Invertebrates: aquatic	Up to county	**Appendix 11G**	Construction of Main Site, construction and operation of Proposed Water Abstraction and Discharge Options. May be relevant at decommissioning stage also, depending on methods and future baseline.
Invertebrates: terrestrial	National	**Appendix 11C**, Annex 11G	Dependent on habitats and habitat conditions potentially sensitive to ammonia and nitrogen deposition during operation.

Species	Value	Location of baseline information (PEI Report Volume II)	Potential Relevance to the EcIA
Reptiles (grass snake)	Local	**Appendix 11C**	Construction of Main Site and Emergency Vehicle Access Road has low potential to affect grass snake if present on a transitory basis. May be relevant at decommissioning stage also, depending on methods and future baseline.
Water vole	District	**Appendix 11F**	Construction of Main Site and associated Emergency Vehicle Access Road, and the laying of electrical connections. May be relevant at decommissioning stage also, depending on methods and future baseline.

11.4.13 For purposes of clarity, the following potential protected and notable species constraints are not relevant to the ecological impact assessment and are therefore not considered further:

- Great crested newt – no likelihood of presence (see **Appendix 11C**);
- Otter – no evidence found (see **Appendix 11F**), precautionary mitigation still appropriate;
- Roosting bats – no suitable trees, buildings or cliffs present in the zone of influence (see **Appendix 11C**);
- Schedule 1 bird species – no suitable nesting and/ or roosting habitat in the zone of influence (see **Appendix 11C**); and
- White-clawed crayfish – no relevant habitat impacts, not present in this part of Lincolnshire (see **Appendix 11C**).

Future Baseline

Construction (2022-2025/2026)

11.4.14 In the absence of the Proposed Development, it is predicted that the habitat context and management of the Proposed Development Site and adjacent land would remain as the current baseline. The approved soft landscaping scheme for the Keadby 2 Power Station would have been implemented but would still be

establishing and is likely at best to have a biodiversity value consistent with comparable nearby habitats.

11.4.15 As no substantive changes in habitat context and condition are predicted, the species value of the Proposed Development Site and adjacent land would also remain consistent with the current baseline. Minor changes (upwards or downwards) in the distribution of some species, e.g. nesting birds or water vole, may occur in line with small-scale changes in habitat structure as a result of ecological succession or other natural processes. Any such changes are likely to be within the range of normal inter-annual variation in the distribution and abundance of species populations. In addition, potentially relevant protected species (e.g. badger) could establish in new locations where they would impose new working constraints, due to a need to ensure compliance with the legislation protecting these species.

Operation (2025/6-2050/51)

11.4.16 Based on available information, there are no grounds to expect any marked change in local land management practice and associated habitats by the time of first commercial operation. The short-term baseline described above for construction is equally applicable to the start of operation. Over the medium-term operational life of the Proposed Development, semi-natural habitats, including any new habitats accompanying the Proposed Development, will have matured and in the absence of preventative management, are likely to be subject to successional change e.g. progression of grassland towards scrub or scrub towards woodland. Where land-use management practices remain unchanged no substantive change in the habitat baseline would be reasonably anticipated.

11.4.17 The assemblage of migratory fish in the River Trent is anticipated to gradually improve over time due to the removal of weirs and other barriers upstream in the wider catchment. Therefore, the river reach associated with the Proposed Development is likely to have an increased functional importance for migratory fish trying to access spawning grounds upstream. While any substantive change in fish stocks is unlikely by the time of first commercial operation, incremental medium-term improvements may be achieved over the operational life of the Proposed Development.

11.4.18 There are also likely to be other general medium-term improvements in the biological quality of the River Trent over time due to WFD requirements (see **Chapter 12**: Water Resources and Flood Risk). The WFD requires all waterbodies to achieve 'good ecological status' by 2027 (which is defined with reference to quantifiable parameters relating to ecological, hydromorphological, physico-chemical and chemical condition) and to experience no deterioration in status. Good ecological status by 2027 is therefore to be assumed.

Decommissioning (post 2050/51)

11.4.19 The future baseline conditions in the vicinity of the Proposed Development is likely to be similar to the anticipated medium-term operational baseline and the same assumptions would apply. Ongoing incremental improvements or successional changes in the quality of the River Trent and other habitats created at a time contemporaneous with construction or operation, can reasonably be anticipated.

11.4.20 The above acknowledged, much of the land relevant to decommissioning activities will be within the built footprint of the Proposed Development Site. Therefore, the baseline conditions relevant to decommissioning will be less ecologically sensitive that those relevant to construction. Similarly, they will also be less ecologically sensitive than the baseline conditions relevant to operation, given the potential zone of influence of decommissioning activities will be considerably reduced compared with operational activities.

11.5 Development Design and Impact Avoidance

11.5.1 The design process for the Proposed Development has included consideration of biodiversity constraints and has incorporated, where reasonably practical, measures to reduce the potential for adverse effects on these, in accordance with the 'mitigation hierarchy' and relevant planning policy. The measures identified and adopted include those that are inherent to the design of the Proposed Development, and those that can realistically be expected to be applied as part of construction environmental best practice, or as a result of legislative requirements.

11.5.2 The measures that have been or will be adopted include those that are inherent to the design of the Proposed Development, and those that can realistically be expected to be applied by the Applicant and their contractor(s) to meet requirements of construction and operational environmental best practice. Measures to deliver compliance with industry good practice and environmental protection legislation during both construction and operation (e.g. in relation to prevention of surface and ground water pollution, fugitive dust management, noise prevention or amelioration) are not described in this section as they can be assumed in accordance with NPS EN-1 paragraph 4.10.3. This guidance advises that it must be assumed that measures available to relevant regulators to secure such requirements will be properly applied and enforced by these regulators. Many of the measures required are already committed and will be set out in the Framework Construction Environmental Management Plan (CEMP) that will accompany the Application.

11.5.3 Similarly, it must be assumed that all relevant protected species legislation will be complied with, as this is mandatory. However, to assist transparency on what is required and what would be provided, measures to comply with relevant protected species legislation, including attainment of necessary licences and permits are summarised below.

11.5.4 The additional development design and impact avoidance measures that have been, or would be, adopted during the construction, operation and decommissioning of the Proposed Development are as follows:

Construction

11.5.5 Construction haul routes and temporary laydown areas established for the construction of Keadby 2 Power Station will be re-used, as far as practicable, for the Proposed Development. This will result in a minor extension in the duration of temporary use (approximately 3-4 years) of these areas, with a consequent comparable minor delay in delivering the approved habitat restoration in these areas. However, this is considered acceptable, given the original relatively low baseline value of the habitats affected by construction of Keadby 2 Power Station, and

because it reduces a need to disturb additional areas of habitat for construction of the Proposed Development. Delayed restoration would be less adverse for biodiversity and nature conservation than additional new temporary land-take.

11.5.6 Additional land required for construction laydown has been informed by ecological appraisal, such that it avoids, as far as reasonably practicable, areas of high quality habitat and includes land of relatively low ecological sensitivity including previously developed land and land under intensive agricultural management (refer to **Chapter 6**: Consideration of Alternatives);

11.5.7 Lighting will be restricted to focussed point use where reasonably practicable (refer to **Chapter 5**: Construction Programme and Management). A Lighting Strategy providing further detail will accompany the Application.

11.5.8 If a new cooling water abstraction point is required on the Stainforth and Keadby Canal then, as far as possible, this will be constructed within the same area of largely unvegetated ground occupied by the recently constructed water intake for the Keadby 2 Power Station. This will be confirmed in the details that accompany the Application, and currently this chapter acknowledges a potential worst-case requirement for a new structure.

11.5.9 Retention and appropriate stand-offs from all watercourses (including those associated with proposed temporary construction laydown areas) except those within which construction works have been identified as necessary within **Chapter 4**: Proposed Development or **Chapter 5:** Construction Programme and Management, and as assessed within this chapter.

11.5.10 The installation and subsequent removal of any temporary cofferdams required to enable construction works within watercourses for the upgrade of Potential Abstraction Options will be completed as far as reasonably practicable, and unless otherwise agreed with regulators, outside the main migratory periods of key fish species to minimise potential impacts on migrating fish returning to upstream watercourses to spawn.

11.5.11 Appropriate silt control measures will be used, if appropriate, during the installation and removal of temporary cofferdams in watercourses (see **Chapter 12**: Water Resources and Flood Risk).

11.5.12 An Ecological Clerk of Works (ECoW) will supervise, instruct and report on all site clearance and construction works with potential to affect protected species, encompassing both licensed and relevant unlicensed activities.

11.5.13 All habitats subject to temporary impacts during construction, such as those within the construction laydown areas, electricity connection route and proposed abstraction options/ discharge corridors, would be reinstated where reasonably practicable on a like-for-like basis at the same location following construction where practical. Where appropriate, well-established plant stock would be used to reduce the time taken to restore habitats to their pre-construction condition.

11.5.14 The following measures would also be undertaken prior to and during construction for the purposes of avoiding impacts on the named species and to comply with relevant legislation.

Water Vole

11.5.15 An appropriate Water Vole Mitigation Strategy will be prepared, using updated baseline information, and agreed with relevant stakeholders to specify the measures and supervision required to deliver legislative compliance during construction of the Main Site and watercourse crossings. It is proposed that submission and approval of the Water Vole Mitigation Strategy will be secured by a Requirement of the draft DCO.

11.5.16 The Water Vole Mitigation Strategy will include details of:

- requirements for further surveys, ongoing monitoring and attendance by an appropriately experienced ECoW;
- appropriate construction stand-offs from watercourses that will be maintained at all times (retained watercourses) or, in the case of watercourse crossings, until such time that the ECoW advises that the relevant construction works can proceed;
- appropriate timings to minimise potential for disturbance impacts on water vole;
- requirements for habitat mitigation and enhancement to accommodate any water voles displaced as a result of land take for the Proposed Development;
- requirements (if relevant) for trapping, exclusion and relocation of water voles from relevant construction areas (based on current levels of activity, see the impact assessment, adjacent retained areas of drains are anticipated to be sufficient to accommodate any water voles displaced);
- site inductions and toolbox talks as appropriate; and
- requirements for licences to permit the relevant construction works to proceed.

Breeding Birds

11.5.17 The following approach would be taken to deliver legislative compliance in relation to nesting birds:

- all clearance of suitable vegetation will be undertaken outside the breeding season (typically March-August inclusive for most species), where possible;
- site inductions and toolbox talks as appropriate; and
- in situations where the above breeding bird mitigation is not possible, the ECoW would check the working area for nests before works commence. If active nests are discovered through this process, then the ECoW will advise on appropriate mitigation to ensure that these are not impacted by construction activities. All relevant works would be completed in accordance with this advice and under the supervision of an ECoW.

Fish

11.5.18 A Fish Management Plan will be prepared and agreed with relevant stakeholders to specify the measures and supervision required to deliver legislative compliance during installation and drawdown of any cofferdam(s) for the upgrade of the River

Water Abstraction Option (if chosen) or the Canal Water Abstraction Option on the Stainforth and Keadby Canal. It is proposed that submission and approval of the Fish Management Plan will be secured by a Requirement of the draft DCO/Marine Licence.

11.5.19 The Fish Management Plan will include details of:

- appropriate timings to minimise potential for disturbance to migratory fish;
- provision for screening of pump intakes to prevent fish being drawn into the pipe/pump;
- supervision of dewatering of any cofferdam(s) by an appropriately experienced ECoW to oversee fish welfare and to support the relocation of any stranded fish or associated wildlife back to the main channel of the relevant watercourse outside the working area; and
- if appropriate, other specialist techniques to support the capture and relocation of fish to the main channel of the relevant watercourse outside the working area prior to drawdown.

General Animal Welfare during Construction

11.5.20 Vegetation clearance and construction excavations have potential to affect wildlife and may result in offences under animal welfare legislation. An ECoW would be employed to supervise all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance.

11.5.21 All excavations would be covered overnight, or where this is not practicable, a means of escape would be fitted e.g. battered soil slope or scaffold plank, to provide an escape route should any animals (e.g. reptiles, badger, otter, brown hare, hedgehog) stray into the construction site and fall into an excavation.

Invasive Species Management Plan (ISMP)

11.5.22 A plant INNS survey will be undertaken prior to construction to determine the current location and extent of plant INNS, and to inform specification of the ISMP. If determined as necessary through this survey and after consideration of other available plant and animal INNS data, an ISMP will be prepared to accompany the final CEMP and would be agreed with relevant stakeholders. The ISMP would specify the measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations. It is proposed that submission and approval of the ISMP will be secured by a Requirement of the draft DCO.

Operation

11.5.23 New fish screens will be installed to an agreed standard at construction during upgrade of water supply infrastructure to achieve compliance with the Eels (England and Wales) Regulations 2009 and other relevant legislation and regulatory requirements during operation of the Proposed Development. No technical challenges to the installation of fish screens have been identified at this stage. Details will be secured by a Requirement of the draft DCO and/ or through the permitting process.

11.5.24 Cooling water will be discharged at a rate and with a chemical water quality compliant with the discharge limits set by the Environment Agency within the Environmental Permit, taking into account Best Available Techniques (BAT) for those discharges.

11.5.25 Lighting will be restricted to focussed point use where reasonably practicable. A Lighting Strategy providing further detail will accompany the Application.

11.5.26 The final stack height(s) for the Proposed Development will be determined at the detailed design stage and will be optimised to aid dispersion of pollutants, with consideration given to minimisation of ground-level air quality impacts, including on relevant biodiversity and nature conservation features. **Chapter 8**: Air Quality, PEI Report Volume I describes the preliminary results of atmospheric dispersion modelling which have informed the maximum and minimum stack heights set out in **Chapter 4**: The Proposed Development. This will be refined further, and the final design parameters including stack heights will be provided with the Application.

Decommissioning

11.5.27 Decommissioning would require submission of a Decommissioning Environmental Management Plan (DEMP) for the approval of the relevant planning authority and will be secured by a Requirement of the draft DCO. Appropriate best practice mitigation measures, including measures to deliver compliance with nature conservation legislation applicable at that time, will be applied during any decommissioning works as documented in the DEMP. No additional mitigation for decommissioning of the Proposed Development beyond such best practice is considered necessary at this stage.

11.6 Likely Impacts and Effects

11.6.1 This section describes the likely impacts and effects of the Proposed Development on relevant biodiversity and nature conservation features in the absence of any mitigation over and above that which is inherent to the design or otherwise mandatory for purposes of legislative and regulatory compliance (as described in Section 11.5 above)

11.6.2 This assessment takes account of guidance on requirements for assessment given in NPS EN-1 (paragraph 4.10.3). This states: "*in considering an application for development consent … focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. … work on the assumption that the relevant pollution control regime and other environmental regulatory regimes, including those on land drainage, water abstraction and biodiversity, will be properly applied and enforced by the relevant regulator*."

11.6.3 In accordance with this guidance, while it remains necessary to assess impacts and effects of emissions to air arising from construction and operation of the Proposed Development, comparable assessment is not extended to other potential pollution sources that are sufficiently addressed though mandatory compliance with legislation, otherwise covered by regulatory regimes in place to control pollution, and/or the mitigation otherwise committed in **Chapter 8**: Air Quality, **Chapter 9:**

Noise and Vibration and **Chapter 12**: Water Resources and Flood Risk (PEI Report, Volume I).

11.6.4 In making this assessment, regard has been given to other relevant Chapters, specifically **Chapter 8**: Air Quality, **Chapter 9**: Noise and Vibration and **Chapter 12**: Water Resources and Flood Risk (PEI Report, Volume I). It is not considered necessary in this chapter to replicate the detailed impact assessments provided in these source chapters. This chapter instead restricts its scope to the relevant points, while signposting where the underpinning data and more detailed assessment can be found. Where mitigation has been identified as necessary in other chapters to address and remove potential significant adverse effects, then it can be assumed that there is a commitment to provide this mitigation, and that it will be delivered as outlined in the relevant chapter and/ or as specified in the Framework CEMP that will accompany the Application.

11.6.5 Relevant biodiversity and nature conservation features are those that are considered to be of local or higher geographic value, and which have potential to be affected by the Proposed Development as summarised in Section 11.4 of this chapter.

Construction

Humber Estuary SSSI, SAC and Ramsar site

11.6.6 An assessment of the likely significant effects of the Proposed Development on the Humber Estuary SAC and Ramsar site, along with other Natura 2000 sites, will be prepared in the form of a Habitat Regulations Assessment (HRA) Screening Report to accompany the Application. Given this, this section is limited to a high-level EcIA of potential impact pathways to establish whether the Proposed Development is likely to have a significant adverse effect on the features of interest of the Humber Estuary SSSI, SAC and Ramsar site.

11.6.7 Construction of the Proposed Development has the potential to affect the designated biodiversity features of interest of the Humber Estuary SSSI, SAC and Ramsar site (as defined in full in **Appendix 11C**, PEI Report Volume II) if the existing water intake and outfall structures on the River Trent need to be upgraded.

11.6.8 Use of the Waterborne Transport Off-loading Area is not considered likely to result in significant impacts and effects given this is an existing facility operated for this purpose as part of the existing port infrastructure at Keadby. It is noted that the load bearing capacity of the wharf and crane pads has recently been upgraded to facilitate the delivery of AIL for the Keadby 2 Power Station construction and a record of determination provided. This recorded no likely significant effects on the Humber Estuary SSSI, SAC and Ramsar site. It is not currently anticipated that additional major upgrades to the wharf or equipment would be required for the Proposed Development although minor upgrades/ use of a mobile crane may be required.

11.6.9 Potential adverse impacts and effects from the upgrade of water supply infrastructure (if required) for the Potential River Water Abstraction Option and Water Discharge Corridor on the River Trent relates to:

- minor loss or disturbance of vegetation on the banks of the River Trent either side of the existing structure(s). This reed and scrub vegetation makes a minor

(local) contribution to the biodiversity value of these designations, but is not a reason for designation;

- temporary loss and disturbance of in-channel mudflat habitats for which the Humber Estuary SAC is designated;
- temporary disturbance of migrating lamprey species, (including disturbance from piling works during cofferdam installation), for which the Humber Estuary SSSI and Ramsar site is designated; and
- disturbance and associated minor and temporary losses of habitat for breeding, passage and wintering birds for which the Humber Estuary SSSI is designated.

11.6.10 At the relevant construction location(s), there is a narrow fringe of common reed dominated vegetation, with some associated small stands of willow scrub (see **Appendix 11C**). The potential construction impact on this terrestrial and marginal vegetation is considered negligible given it is of such small-scale in the context of the total resource of comparable vegetation along this section of the River Trent within the Humber Estuary designations. Rapid re-establishment of comparable vegetation can reasonably be expected on the completion of construction. Any adverse ecological effect will therefore be small-scale and of short duration (reeds can be expected to re-establish from immediately adjacent unaffected areas within 2 to 5 years). Given this, it is considered that any required construction works will not affect the nature conservation status of the common reed and scrub habitats present along this section of the River Trent, or consequently the integrity of the Humber Estuary SSSI, SAC and Ramsar site designations.

11.6.11 As explained in more detail in **Chapter 12**: Water Resources and Flood Risk, the committed approach for the use of cofferdams, where required, minimises the potential for designated features of interest to be adversely affected. This includes both in-channel habitats, birds and bird habitats and lamprey species (no other designated species features are reasonably expected to be present within this tidal river reach given its relative distance from the Humber Estuary).

11.6.12 Use of a cofferdam(s) to create and maintain dry in-channel working areas will help to reduce overall channel disturbance and sediment generation. Any cofferdam(s) will be designed to minimise changes in riverbed and bank erosion and toe scour over the duration of their use, and the duration of any cofferdam(s) being in place will also be minimised to reduce the potential for erosion and scour impacts. Other bank protection mitigation can also be applied to further reduce the potential for erosion and scour impacts. On that basis, there would be no likely potential for the adjacent and downstream channel and banks to be adversely affected by construction works. Even if sediment was generated during installation of cofferdams, it is considered that this would not be ecologically damaging in the context of a highly turbid tidal river reach. Previous WFD assessments (e.g. AECOM, 2015) of dredging operations at the same locations concluded no likely significant adverse effects on water quality or water biodiversity. The proposed construction works are of broadly comparable extent and scale to previous works and therefore the findings of these previous assessments remain valid for the Proposed Development. It is therefore considered that sediment generation, if this were to occur, would not adversely affect the nature conservation status of in-channel

habitats or the integrity of the Humber Estuary SSSI, SAC and Ramsar site designations.

11.6.13 Construction works will directly and indirectly reduce the extent and quality of intertidal mudflat habitats in the immediate vicinity of any construction works e.g. through removal and drying of sediments behind any cofferdam(s). However, the area of habitat affected is considered negligible in the context of the size of the Humber Estuary and the extent of comparable intertidal mudflat habitats (worst-case estimate of 0.25ha (<0.01%) in the Proposed Development Site, compared to 9,384ha stated on the citation for the Humber Estuary SAC). In addition, any such small-scale loss of mudflat habitat would be temporary as natural tidal processes will rapidly reintroduce sediments and reinstate mudflats once any cofferdam(s) are removed on the completion of works. Any ecological effect will therefore be small-scale and of short duration (mudflats can be expected to recover rapidly from temporary disturbance (Elliott *et al*. 1998; Natural England, 2020) through recharge with sediments present in the local area also through wider tidal movements, within 2 to 5 years). Given this, it is considered that the required construction works will not adversely affect the conservation status of mudflat habitats along this section of the River Trent or the integrity of the Humber Estuary SSSI, SAC and Ramsar site designations.

11.6.14 The above habitat assessment indicates that habitat quality for the birds for which the Humber Estuary SSSI and Ramsar site are designated is unlikely to be adversely affected. Losses of bird habitats would be small-scale and of limited duration, and likely within the limits of natural inter-annual variation in habitat quality and extent. Following completion of construction, comparable habitat structure and function for birds would rapidly re-establish. Construction works might also affect birds through disturbance and displacement when using adjacent habitats e.g. adjacent mudflats at low tide. However, the potential disturbance zone of influence, (noting that piling operations are likely to give rise to the most disturbance), is considered small-scale in the context of the full extent of comparable habitats for birds in the wider designations. In addition, habitat extent and quality for breeding, passage and wintering birds is limited in the zone of influence of the Proposed Development, being restricted to narrow stands of common reed and narrow marginal mudflats. Habitat quality for the bird species and assemblages named on the SSSI and Ramsar site citations is therefore relatively limited and, given this, it is considered that the bird interest of these designations will be concentrated in habitats located elsewhere within the boundaries of these large designations. It is considered that the construction disturbance would not adversely affect the nature conservation status of these bird species and assemblages relevant to the designations.

11.6.15 The Proposed Development is located at a location along the River Trent where construction impacts could have a substantive but temporary effect on the ability of lamprey (and other migratory fish) species to access breeding habitats in the wider River Trent catchment as a whole, and to return to the Humber Estuary from these habitats. The most likely potential mechanisms for such an impact are through either direct barriers to lamprey movement from any cofferdam(s), or indirect barriers to movement from noise and vibration disturbance (e.g. during piling operations). Noise and vibration could also result in injury to or mortality of lampreys.

11.6.16 The likelihood of construction works resulting in a significant barrier to lamprey and other fish movements is considered low given both the practicalities of undertaking in-channel construction works on a large tidal river, and because of the existence of regulatory regimes that would require prior agreement of sensitive construction timings and methods in order to obtain a permit for the required works. As set out in **Chapter 12**: Water Resources and Flood Risk, the timing of any cofferdam installation for the summer months for reasons of flood risk management will reduce potential for these lamprey species to be affected when they are migrating upstream to their breeding habitats. A Fish Management Plan (refer to Section 11.5) will be implemented prior to commencement of construction.

11.6.17 The river lamprey typically migrates upstream over October to December, while optimal conditions for sea lamprey migration upstream are generally considered to coincide with the period April to June (Maitland, 2003). So, agreement of appropriate sensitive timings for any cofferdam installation and removal would be effective for minimising potential for migrating river and sea lamprey to be affected (requirements for other relevant fish species would also need to be considered, see Fish, below). Given this, no adverse effect on the conservation status of lamprey species are likely as a result of direct and indirect barriers to migratory movements.

11.6.18 Lamprey species could also be trapped within any cofferdam structure(s) and be affected by dewatering. Again, this risk would need to be appropriately managed to deliver legal compliance (see Section 11.8) and as required by the permit for these works, so this is unlikely to adversely affect the nature conservation status of lamprey species.

11.6.19 Once any cofferdam(s) are in place, they will not pose a barrier to lamprey movements along this section of river given that any cofferdam(s) are unlikely to extend into the river channel beyond 25m from the western bank of the River Trent. This is a relatively small distance in the context of a river channel that is circa 150m wide, so lamprey species will still be able to move along the channel past the length of any cofferdam without impedance. While there is also a return migration of juvenile lampreys to the sea in July to September, it is considered likely that any cofferdam(s) would either be in place or removed before this downstream migration peaks, so construction would also not impede this downstream migration. The removal of any cofferdam(s) would be subject to the same restrictions on timings as installation, as explained above.

11.6.20 Considering the potential for injury or mortality of fish due to noise and vibration from piling; again, such impacts are unlikely, given the commitment to the sensitive timing of works, and the need to comply with all relevant legislative and regulatory requirements. However, this will be assessed further, and details will be provided within the ES to accompany the Application. The extent to which intense underwater sound might cause an adverse environmental impact in particular fish species is dependent upon the level of noise, its frequency, duration and/ or repetition rate of the sound. The range of potential effects from intense sound sources, such as pile driving, includes immediate death, permanent or temporary tissue damage and hearing loss, behavioural changes and masking effects. Behavioural changes can potentially result in animals avoiding migratory routes or leaving feeding or reproduction grounds.

11.6.21 This acknowledged, lamprey species, as with other fish that lack a swim bladder, are of known low potential sensitivity compared with fish with swim bladders (such as Atlantic salmon and European eel, see Fish, below). Previous studies indicate that lamprey species are unlikely to experience injurious impacts from piling at distances of greater than 5m from the noise/ vibration source. Therefore, in the context of a watercourse the size of the River Trent, and the proposed timing of works in the summer months, outside the main migration period, it is considered that the likelihood of lamprey species experiencing injurious noise and vibration is very limited. Given these considerations, and while an impact on individual fish cannot be completely discounted, it is considered that piling and other construction works of limited extent and duration would be unlikely to adversely affect the conservation status of river and sea lamprey. Further assessment will be provided with the Application.

11.6.22 On the basis of the current ongoing design work and assessment, and given existing regulatory regimes and permit requirements, it is considered that the potential for a worst-case temporary impact on the nature conservation status of the designated habitats and species, and the integrity of the designations, would occur at the local level only. Therefore, the potential construction effect on the Humber Estuary SSSI, SAC and Ramsar site is assessed as **minor adverse (not significant)**.

Other International and National Nature Conservation Designations

11.6.23 Based on consideration of possible impact pathways and the findings of **Chapter 8**: Air Quality, **Chapter 9**: Noise and Vibration and **Chapter 12**: Water Resources and Flood Risk (PEI Report, Volume I), there are no likely significant direct or indirect construction impacts and effects on any other statutory nature conservation designations.

Stainforth and Keadby Canal Corridor LWS

11.6.24 Stainforth and Keadby Canal Corridor LWS is a 10km long watercourse and habitat corridor designated, and of county nature conservation value, for its aquatic and wetland plant interest, and the associated ancillary bank-top scrub and grassland habitats that supplement the biodiversity value of the LWS. The habitat and species conditions present within the LWS where they coincide with the Proposed Development Site are described in **Appendices 11C, 11F and 11G** (PEI Report Volume II).

11.6.25 The LWS will be directly affected by construction of the Proposed Development if the Potential Canal Water Abstraction Option on the Stainforth and Keadby Canal is selected as the proposed water supply for the Proposed Development. It is anticipated that a new water intake structure would be constructed directly adjacent to the intake constructed to supply Keadby 2 Power Station. Construction requirements will be confirmed in the Application.

11.6.26 Assuming this option is selected and considering worst-case construction requirements, construction of the Proposed Development has the potential to affect the designated biodiversity interest of the LWS as follows:

- permanent loss of bank and marginal vegetation along approximately 30m of the canal bank (within the context of a LWS that is 10km long, and therefore has up to 20km of existing canal bank habitat) at the location of the proposed structure. At this location, the banks are vertical and reinforced, so are not favourable for the establishment of vegetation;
- temporary disturbance to bank and marginal vegetation during construction activities either side of the required structure. Again, at this location the banks are vertical and reinforced, so are not favourable for the establishment of vegetation; and
- temporary loss and disturbance of in-channel habitats arising from potential requirements for cofferdams and dewatering.

11.6.27 The location of the proposed construction works coincides with land already disturbed for construction of the Keadby 2 Power Station abstraction structure. At the time of assessment, construction works for Keadby 2 Power Station were ongoing, and therefore it is unlikely that any substantive cover of vegetation will have re-established by the time construction works for the Proposed Development take place, particularly given the existing unfavourable bank structure and construction. Given this, the temporary and/or permanent losses of up to 30m of bank and marginal vegetation are anticipated to be negligible as a result of construction of the Proposed Abstraction Option, and there would be no adverse effect on the integrity of the LWS from these bank works.

11.6.28 Similarly, in-channel habitats have also been disturbed and affected for construction works for Keadby 2 Power Station. Therefore, construction works for the Proposed Development are not likely to further affect the structure and nature conservation value of in-channel habitats and vegetation at this location, but these construction works would delay for a further 3-4 years the potential for the re-establishment of in-channel habitats and vegetation at this location. It is considered that this would not be adverse for the biodiversity and nature conservation value of this section of the canal or the wider LWS given the limited construction footprint required (as already evidenced by the approach for Keadby 2 Power Station) and the findings of the aquatic plant and invertebrate surveys as reported in **Appendix 11G** (PEI Report Volume II).

11.6.29 The potential worst-case impact on the nature conservation status and integrity of the Stainforth and Keadby Canal LWS would be adverse at up to the local level only, given the habitat conditions present, the extent of the LWS and prior disturbance during construction of Keadby 2 Power Station. Therefore, the potential construction effect on the LWS is assessed as **minor adverse (not significant)**.

Hatfield Waste Drain LWS

11.6.30 There is limited potential for disturbance to the banks of the LWS during the potential removal and replacement of the existing bridge crossing over the LWS, at the Proposed Development Site entrance off the A18.

11.6.31 The existing bridge is single span and supported on metal girders. Given this, no substantive excavation or construction works are anticipated to complete the required works. It is anticipated that any new bridge deck required will be pre-

fabricated off-Site and erected in-situ over a short timescale (circa 1 weekend). Given that the LWS is 10.3km long, and therefore has over 20km of associated bank habitat, the minor construction works for the Proposed Development will not adversely affect either the integrity of the LWS or the nature conservation status of its habitats. Given this, the potential construction effect on the LWS is assessed as **neutral (not significant)**.

Other Local Nature Conservation Designations

11.6.32 Based on consideration of possible impact pathways and the findings of **Chapter 8**: Air Quality, **Chapter 9**: Noise and Vibration and **Chapter 12**: Water Resources and Flood Risk (PEI Report, Volume I), there are no likely significant direct or indirect construction impacts and effects on any other local nature conservation designations.

Scrub Habitats

11.6.33 There are likely to be minor losses of scattered bramble, hawthorn and dog-rose scrub of local nature conservation value where this coincides with localised areas required for temporary works (e.g. the laying of electrical connections). But scrub would be able to recolonise these areas after construction, so no permanent habitat losses are anticipated. In the event that scrub did not re-establish, it is considered that such minor losses of scattered scrub would not be adverse for the nature conservation status of scrub habitats. Such habitats are common in the wider landscape and typically include a comparable suite of common shrub species. On this basis, any small-scale loss of scattered scrub is assessed as **neutral (not significant)**.

Watercourse Habitats

11.6.34 Construction of the Main Site would result in the loss of one minor field drain (Drain D4 – see **Figure 11G** presented in **Appendix 11G** of PEI Report Volume II) of up to local biodiversity and nature conservation value. This drain is 400m long, does not hold permanent water and supports only a very limited diversity of aquatic and wetland plant species (four higher plant species only). However, it does have a minor value in terms of the contribution it makes to the wider network of field drains in the local area, and it connects to and, during periods of high water levels, provides water to other drains of higher nature conservation value. This includes Keadby Boundary Drain LWS.

11.6.35 Given the limited existing biodiversity and nature conservation value of this drain, it is considered that the impact arising from habitat loss can be readily compensated through sensitive design of the surface water attenuation infrastructure required by the Proposed Development, and habitat enhancement works to improve the quality of other similarly low value drains associated with the boundaries of the Main Site (as indicated as essential within the construction impact assessment for water vole, see below).

11.6.36 Construction also has the potential to affect the drain on the northern boundary of the Main Site (Keadby Common Drain) which supports an assemblage of aquatic and wetland plants of county value (see **Appendix 11G**, PEI Report Volume II). This

drain could be directly affected by construction of a bridge crossing for the proposed Emergency Vehicle Access Road (refer to **Chapter 4**: The Proposed Development in PEI Report Volume I).

11.6.37 In addition, there are two other short sections of drain (a second section of Keadby Common Drain and Glew Drain) that are crossed by and could be affected during construction of the Proposed Development as they coincide with the northern routing for a potential electrical connection to the Northern Powergrid 132kV Substation, (should this option/ route be chosen) and any upgrade works required to the existing track to provide an emergency access road from the northern boundary of the Proposed Development Site towards Chapel Lane (refer to **Figure 3.2** in PEI Report Volume III). Of these, Glew Drain has not been surveyed as land access has yet to be agreed to permit this. No other drains are likely to be affected by construction, as they coincide with existing infrastructure for the Keadby 1 and 2 Power Stations.

11.6.38 The above construction works are not likely to impact the nature conservation status of the aquatic and wetland plant assemblages associated with the above drains. Worst-case construction requirements would affect no more than 15m stretches of drain bank and channel at each crossing location. The shortest of the affected drains is Glew Drain, which is 150m long. Therefore, at the worst-case, construction would affect up to 10% of the total drain length, with the remaining 90% remaining suitable to support aquatic and wetland plants. In comparison, construction works on the Keadby Common Drain between Chapel Lane and the former Keadby Ash Tip would affect up to 2.5% of this 1.2km long section of drain, leaving 97.5% unaffected.

11.6.39 Mandatory requirements to comply with relevant legislation, along with the requirements of permitting and regulatory regimes, are sufficient to prevent potential adverse impacts and effects on watercourse habitats (see further commentary on this in paragraph 11.6.2). Similarly, no other relevant terrestrial or wetland habitats are identified that require specific assessment within this section.

11.6.40 The loss of a 400m long drain of local nature conservation value and additional localised and relatively small-scale permanent construction impacts on other drains of up to county nature conservation value would not affect the wider nature conservation status of drain habitats and their associated aquatic and wetland plant. Therefore, the impact is of local scale only and restricted to the immediate footprint of the relevant construction works. So, the combined effect is assessed as **minor adverse (not significant)**.

Bats

11.6.41 The only part of the Proposed Development where bats and their habitats could provide a relevant construction constraint is the Main Site. Baseline surveys in 2020 recorded very low levels of bat activity within habitats on the boundary of and adjacent to the Main Site (see **Appendix 11E**, PEI Report Volume II), but not within the main area of the Main Site. It is assumed that this is because the habitats present are sub-optimal for bats (open improved grassland) and relatively unattractive, given the abundant resource of optimal bat foraging and commuting habitat in the wider adjacent landscape (including the habitat corridor along the Stainforth and Keadby Canal and the former Keadby Ash Tip).

11.6.42 There would be no impact on bat roosts as a result of construction of the Proposed Development, as no suitable trees or buildings are present within areas that would be affected by construction activities.

11.6.43 The loss of a single field drain (Drain D4 – see **Figure 11F.1** presented in **Appendix 11F** of PEI Report Volume II) within Keadby Common represents the only permanent loss of habitat of potential importance to foraging and commuting bats. The survey results reported in **Appendix 11E** (PEI Report Volume II) identified no bat activity in association with this drain.

11.6.44 Construction lighting is not considered a relevant potential impact on bats as the proposed core working hours during construction (07:00 to 19:00, see **Chapter 5**: Construction and Management) mean that lighting is not likely to be required at times of day when bats are active or would only be used at times of year when bats are less active or in hibernation. Regardless, the survey data indicates that the consequences of any lighting impact on bats would be negligible given the very low levels of bat activity recorded in the vicinity of the Main Site, and given that lighting would be designed so as not to illuminate foraging habitats adjacent to the Proposed Development Site of greater potential value to bats (e.g. the Stainforth and Keadby Canal habitat corridor). Details would be set out in the Lighting Strategy which would accompany the Application.

11.6.45 Given the above, it is assessed that there would be no likely effect on the nature conservation status of bat species and a bat assemblage of up to district value. The potential construction effect on bats is assessed as **neutral (not significant).**

Water Vole

11.6.46 The only parts of the Proposed Development Site where water vole and its habitats might be a relevant construction constraint are the Main Site, and the sections of Glew Drain and Keadby Common Drain that coincide with the northern routing for a potential electrical connection to the Northern Powergrid 132kV Substation (should this option/ route be chosen), and any upgrade works required to the existing track to provide an emergency access road from the northern boundary of the Proposed Development Site towards Chapel Lane (refer to **Figure 3.2** in PEI Report Volume III).

11.6.47 Baseline surveys in 2020 recorded limited evidence of water vole within the Main Site (see **Appendix 11F**, PEI Report Volume II). Habitats in most of the drains associated with the Main Site were found to be sub-optimal for water vole due to a combination of summer drying (all but one drain was dry by the time of the August survey), succession to a relatively dry tall emergent plant community, and extensive over-shading from scrub.

11.6.48 Construction of the Main Site requires the permanent loss of the field drain (Drain D4 – see **Figure 11F.1** presented in **Appendix 11F** of PEI Report Volume II) within the centre of Keadby Common. This drain did not hold water at the time of the August water vole survey and was dominated by rank emergent vegetation. This drain only connects to other drains at one end, so does not provide a habitat linkage that allows water voles to move between other areas of suitable habitat. One water vole burrow (equivalent to one water vole territory) was recorded on this drain, and there would

be a permanent loss of this burrow and the wider water vole habitat within this drain as a result of construction of the Proposed Development.

11.6.49 In addition, low levels of water vole activity were recorded from the drains on the northern and southern boundaries of the Main Site. The northern drain holds permanent water and provides habitat connectivity with other drains located outside the Proposed Development Site. The southern boundary drain is less suitable, as it was dry at the time of the August survey, heavily shaded along much of its length.

11.6.50 These drains need to be bridged for purposes of construction access or to provide a permanent emergency access route. It is anticipated that the existing access installed for Keadby 2 Power Station over the southern boundary drain can be retained for use by the Proposed Development, however, a bridge will be constructed over the northern drain to provide a long-term emergency access route for the Proposed Development. Four water vole burrows and 4 latrines were recorded from the northern boundary drain (with their locations indicating less than four water vole territories), and three burrows and four latrines on the southern boundary drain (maximum of two water vole territories). The patchy distribution of water vole activity within these drains indicates that it may be possible to position the bridge crossings to avoid locations occupied by water voles. In addition, sensitive bridge design will seek to maintain habitat connectivity for water vole.

11.6.51 It is assumed, pending access for survey to Glew Drain, that the minor works for the installation of the northern routing for a potential electrical connection to the Northern Powergrid 132kV Substation, (should this option/ route be chosen) could affect one or two water vole territories on each of the affected drains. The loss of habitat would be temporary and of short duration, after which the affected sections of watercourse would be reinstated back to a condition suitable for use by water vole.

11.6.52 Based on current levels of water vole activity, the Proposed Development is not likely to result in the loss of water vole from the Proposed Development Site. There is sufficient unoccupied comparable habitat within the wider connected drain network around the Main Site to accommodate any water voles displaced by permanent or temporary habitat losses. In addition, the patchy distribution of water vole activity indicates that it may be possible to position watercourse crossings to avoid locations occupied by water voles. Appropriate mitigation would need to be provided and can be assumed given legal requirements would need to be met (see Section 11.5 of this chapter).

11.6.53 It is also considered that habitat enhancement for water vole could be secured through the Proposed Development, resulting in an increase in habitat suitability within unoccupied drains associated with the Main Site e.g. as can reasonably be achieved through scrub clearance to remove over-shading of the drain banks, and removal of dense emergent vegetation to reinstate open water habitats. Options to provide this will be considered and identified as part of the Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) that will accompany the final Application.

11.6.54 Taking the above into account, it is considered that construction of the Proposed Development can be achieved while retaining habitat and habitat connectivity for the existing small population of water voles associated with the drains within the Main

Site. Given this, and mandatory requirements for appropriate mitigation to deliver legislative compliance (as detailed is Section 11.5), there would be no likely impact on the nature conservation status of water vole. The potential construction effect on water vole is assessed as **neutral (not significant)**.

Badger

11.6.55 See **Appendix 11D**: Confidential Badger Report (PEI Report Volume II). The potential construction effect on badger is assessed within this report as **neutral (not significant)**.

Grass Snake

11.6.56 Construction works at the Main Site would result in the loss of a field drain and 14ha of improved grassland habitats with the potential for occasional and transitory use by small numbers of grass snake. Similarly, while there is negligible habitat suitable for grass snake elsewhere in the Proposed Development Site, the possibility of occasional and transitory occurrences cannot be discounted, particularly in relation to habitats adjacent to the River Trent and the Stainforth and Keadby Canal (see **Appendix 11C**: PEA Report, PEI Report Volume II).

11.6.57 The habitat impact and its consequences for grass snake as a consequence of the Proposed Development would be negligible given the limited habitat loss and/ or the existing quality of this habitat for grass snake, and the occasional and transitory use of this habitat as part of a much wider resource of suitable accessible habitats for grass snake, including those associated with the adjacent former Ash Tip. Therefore, construction works would not impact the structure and function of grass snake habitats such that there would be an effect on the nature conservation status of grass snake.

11.6.58 Given the above, the only potential pathway for an impact on the nature conservation status of grass snake would be as a consequence of killing or injury during site clearance works. There is already a commitment to agree a Precautionary Working Method Statement for relevant protected species, and for supervision of construction works by an ECoW (see the Impact Avoidance Measures detailed above in Section 11.5). With these embedded mitigation commitments, the potential for reptiles to be killed or injured will be negligible.

11.6.59 It is assessed that the Proposed Development would not adversely affect the nature conservation status of grass snake, so the effect is assessed as **neutral (not significant)**.

Breeding Birds

11.6.60 The construction of the Proposed Development is not likely to affect the nature conservation status of any species of breeding bird, given the limited habitat losses to the Proposed Development, the types of habitats affected and their relative suitability for use by breeding birds, and consideration of the bird species likely to use these habitats (refer to **Appendix 11C** in PEI Report Volume II). In addition, the commitment to provide proportionate biodiversity enhancement under the terms of a LBMEP (see Section 11.7 of this chapter) is considered sufficient to compensate for

the minor permanent losses of nesting bird habitat (mainly improved grassland) resulting from construction of the Proposed Development.

11.6.61 The potential effect on breeding birds is assessed as **neutral (not significant)**.

Fish

11.6.62 The implications of construction of the Proposed Development for fish habitats has been assessed in relation to the watercourses concerned i.e. the River Trent and the Stainforth and Keadby Canal. As these watercourses are subject to nature conservation designations, this assessment can be found within the impact assessment for these designations (see above). This habitat assessment is not repeated here; rather, it presents an assessment of potential construction impacts on relevant fish species.

11.6.63 The potential impact pathways relevant to fish species are comparable to those described and assessed for river and sea lamprey in relation to the Humber Estuary designations (see section 11.6 above), including potential implications for migratory fish species (Atlantic salmon and European eel) at the point of their entry to and exit from the River Trent catchment. However, as previously described, such species are potentially more sensitive to construction works than lamprey species due to aspects of their physiology (as fish species with swim bladders).

11.6.64 The Proposed Development is located at a key point along the River Trent where construction impacts could have a substantive but temporary effect on the ability of migratory fish species to access breeding habitats in the wider River Trent catchment as a whole, and to return to the Humber Estuary from these habitats. Therefore, the river at this location is of regional nature conservation value for migratory fish. In comparison, the Stainforth and Keadby Canal is not suitable for use by most migratory fish species but will be used by European eel. Given that the canal represents one of a number of watercourses in the River Trent catchment suitable for use by European eel, the canal is considered to be of local nature conservation value for this species.

11.6.65 The potential mechanisms for an impact on migratory fish are through either direct barriers to fish movement from the use of cofferdam(s), or indirect barriers to movement from noise and vibration disturbance (e.g. during piling operations). Noise and vibration could also result in injury to or mortality of migratory and other fish species.

11.6.66 The likelihood of construction works resulting in a significant barrier to fish movements is considered low, given both the practicalities of undertaking in-channel construction works on a large tidal river, and because of the existence of regulatory regimes that would require prior agreement of sensitive construction timings and methods in order to obtain a permit for the required works. Prior evidence from construction works for Keadby 2 Power Station (see photograph 22 in **Annex B** of **Appendix 11C** in PEI Report Volume II) indicate that any cofferdam required on the relatively shallow Stainforth and Keadby Canal would be very small scale will negligible encroachment into the canal.

11.6.67 As set out in **Chapter 12**, the timing of cofferdam installation on the River Trent for the summer months for reasons of flood risk management will reduce potential for

migratory fish species to be affected when they are migrating upstream to their breeding habitats. Further agreement of precise timings for construction works would be set out in the required permit. This will be reviewed further in the Application when the requirements for use of cofferdam(s) has been further considered. While flood risk limitations on the timings of cofferdam installation on the Stainforth and Keadby Canal are potentially less restrictive, this also indicates potential for greater flexibility on when works can be completed to avoid potential impacts on relevant migratory fish.

11.6.68 A variety of fish (migratory or otherwise) could potentially be trapped within any cofferdam structure and be affected by dewatering. Again, this risk would need to be appropriately managed to deliver legislative compliance (see Section 11.5) and as required by the permit for these works, so again it is unlikely to adversely affect the nature conservation status of and fish species.

11.6.69 Once any cofferdam(s) are in place, they will not pose a barrier to fish movements and habitat use given the cofferdam(s) will extend no further into the River Trent channel than 25m from the banks, and 15m in the case of the structure on the Stainforth and Keadby Canal. This is a relatively small distance in the context of a river channel that is 150m wide, and in the case of the canal impinges less than 50% of the 35m total channel wide. As such, fish species will still be able to move along these watercourses past the length of the coffer dam(s) without impedance.

11.6.70 The potential for injury or mortality of fish due to noise and vibration from piling during installation of cofferdam(s) requires consideration. The extent to which intense underwater sound might cause an adverse environmental impact in particular fish species is dependent upon the level of noise, its frequency, duration and/ or repetition rate of the sound. The range of potential effects from intense sound sources, such as pile driving, can include immediate death, permanent or temporary tissue damage and hearing loss, behavioural changes and masking effects. Behavioural changes can potentially result in animals avoiding migratory routes or leaving feeding or reproduction grounds. Again, it is considered that such potential effects are unlikely given the commitment to the sensitive timing of works to meet legislative and regulatory requirements.

11.6.71 **Chapter 9**: Noise and Vibration includes worst-case predictions of noise levels during cofferdam installation and removal at a range of noise sensitive receptors (NSR). Conservative assumptions have been included in the assessment (e.g. sheet piling only to represent highest noise levels and full day working) to ensure a representative worst-case is assessed.

11.6.72 It is envisaged that the duration of piling works likely to be required on the River Trent is likely to be greater, given the nature/ size of the watercourse than would be the case on the Stainforth and Keadby Canal. Further assessment will be provided in the ES to accompany the Application, considering comparable consented works for Keadby 1 and Keadby 2 Power Station.

11.6.73 A prior review of the relevant issues (Transport for London, 2016) indicates that Atlantic salmon and European eel; the two fish species of likely greatest relevance, are of medium hearing sensitivity. These species are also considered to represent suitable proxies for the potential sensitivity of other fish species present within the

affected watercourses. Previous studies indicate that fish species with medium hearing sensitivity are unlikely to experience injurious impacts from piling at distances of greater than 12m from the noise/ vibration source. Therefore, in the context of a watercourse the size of the River Trent, the likelihood of such fish species experiencing injurious noise and vibration, when works will be timed for the summer months outside the main migration period, is likely to be very limited.

11.6.74 The Stainforth and Keadby Canal is a much smaller watercourse in comparison to the River Trent but, as identified above, there is much greater flexibility on when works can be completed to achieve sensitive timing, and the magnitude and duration of any piling works required is anticipated to be reduced.

11.6.75 Given these considerations, and while an impact on individual fish cannot be completely discounted, it is considered that piling and other construction works of limited extent and duration would be unlikely to adversely affect the conservation status of any fish species. Further assessment will be provided with the Application to confirm this.

11.6.76 On the basis of the current ongoing design work and assessment, and given existing regulatory regimes and permit requirements, it is considered that the potential for a worst-case temporary impact on the nature conservation status of fish species will be at the local level only. Therefore, the potential construction effect on migratory and fish species is assessed as **minor adverse (not significant)**.

Aquatic Invertebrates

11.6.77 Surveys for the Proposed Development have identified a single watercourse supporting a notable assemblage of aquatic invertebrates. This is Keadby Common Drain on the northern boundary of the Main Site (see **Appendix 11G**, PEI Report Volume II) which supports an assemblage of aquatic invertebrates of county value. This drain could be directly affected by construction of a bridge crossing for the proposed Emergency Vehicle Access Road (see **Figure 3.2** in PEI Report Volume III).

11.6.78 The only other watercourses of potential aquatic invertebrate value and relevant to construction are two drains (a second section of Keadby Common Drain, and Glew Drain) located on the alignment of proposed electrical connections. These drains have not yet been surveyed, as the requirement for these connections was not known at the time of survey. On a precautionary basis it is assumed that these drains could also be of county value for aquatic invertebrates. Survey information for these drains will accompany the Application if they remain relevant at the time of submission. No other drains are likely to be affected by construction, as they coincide with existing infrastructure for the Keadby 1 and 2 Power Stations.

11.6.79 The above construction works are not likely to impact the nature conservation status of the aquatic invertebrate assemblages associated with the above drains. Worst-case construction requirements would affect no more than 15m stretches of drain bank and channel at each crossing location. The shortest of the affected drains is Glew Drain, which is 150m long. Therefore, assuming a worst-case, construction would affect up to 10% of the total drain length, with the remaining 90% remaining suitable to support the aquatic invertebrate assemblage. In comparison, construction

works on the Keadby Common Drain between Chapel Lane and the former Keadby Ash Tip would affect up to 2.5% of this 1.2km long section of drain, leaving 97.5% unaffected.

11.6.80 No likely direct or indirect construction impacts and effects on watercourses of importance for aquatic invertebrates are identified in **Chapter 12:** Water Resources and Flood Risk (PEI Volume I) or considered likely in this chapter. Mandatory requirements to comply with relevant legislation, along with the requirements of permitting and regulatory regimes, are sufficient to prevent potential adverse impacts and effects (see further commentary on this in paragraph 11.6.2).

11.6.81 The localised and small-scale construction impacts on aquatic invertebrates and their habitats is not considered likely to affect the nature conservation status of the relevant species and assemblages beyond the immediate footprint of the relevant construction works. So, the effect is assessed as **neutral (not significant)**.

Invasive Non-native Species of Plants and Animals

11.6.82 There is limited potential for construction of the Proposed Development to cause the spread of plant and animal INNS. **Appendices 11C** and **11G** (PEI Report Volume II) identify a limited suite of relevant species as follows:

- Wall cotoneaster is present on adjacent land within the former Keadby Ash Tip and may be relevant at the time of construction if it colonises the Proposed Development Site in the lead into construction;
- New Zealand pigmyweed is present on the banks of the River Trent at the locations of the Proposed River Water Abstraction Option and the Proposed Water Discharge Corridor outfall. This species could be disturbed during construction if there is a requirement to upgrade the existing water abstraction and discharge structures at these locations;
- Nuttall's waterweed is present within the drain located on the northern boundary of the Main Site and could be disturbed during construction of a bridge for the proposed Emergency Vehicle Access Road where construction works are required within the channel of the drain; and
- Nuttall's waterweed, zebra mussel and demon shrimp are present within the Stainforth and Keadby Canal (**Appendix 11G**, PEI Report Volume II) at the location of the Proposed Canal Water Abstraction Option. These would only be relevant if a new water intake structure is required to supply the Proposed Development.

11.6.83 There is potential for seeds/ propagules of the above relevant plant INNS (Nuttall's waterweed, New Zealand pigmyweed and wall cotoneaster) to be disturbed and transferred to new sites as a result of construction activities associated with the Proposed Development. For example, seeds/ propagules could be carried on vehicles, machinery and equipment to new locations within the Proposed Development Site or at distance from the Proposed Development. However, the likelihood of this occurring will depend on the final land and construction requirements for the Proposed Development, the details of which will accompany the Application.

11.6.84 Similar pathways for spread occur in relation to the aquatic animal INNS (zebra mussel and demon shrimp also). Larvae and/ or adults of these animal INNS could be transferred to new locations on vehicles, machinery and equipment if these are not thoroughly cleaned and/ or adequately drained and dried before movement to and use at another site.

11.6.85 It is not possible to assess the consequences of this for biodiversity as the scale of effect would depend on the INNS concerned, the number of seeds/ propagules/ animals dispersed, the ecology of the habitats affected, and the pre-existing status of the relevant INNS in these habitats. This is not considered material to this impact assessment, as it is primarily a matter for legal compliance. It is an offence to cause the named plant INNS to spread in the wild, so appropriate mitigation will be put in place to ensure legal compliance and these measures are adequate to address all relevant plant and animal INNS. Such mitigation will be outlined in the Framework CEMP and draft LBMEP that will be prepared to accompany the Application.

11.6.86 There is a requirement for mitigation to be applied effectively to provide legal compliance (see Section 11.5). On this basis, it is considered that propagules of INNS would not be spread beyond the immediate construction working area, and therefore there are no construction pathways likely to result in a significant adverse effect on biodiversity and nature conservation.

Operation

11.6.87 To enable a focussed impact assessment, an initial screening exercise has been completed (refer to **Appendix 11C** in PEI Report Volume Ii) to determine which of the potential impacts during the operational phase are likely to result in effects on ecological features, following the implementation of development design and impact avoidance measures outlined in Section 11.5. These are taken forward in the impact assessment that follows. Those impacts that are considered unlikely to result in effects are scoped out and not considered further.

11.6.88 Potential impacts during the operational phase that could result in effects on ecological features are as follows:

- air quality impacts - air pollution from stack emissions, potentially leading to adverse effects on sensitive habitats, including nature conservation designations, through increased ammonia, nitrogen and acid deposition; and
- disturbance impacts - external operational lighting and noise has potential to affect bats where it coincides with their foraging and commuting habitats

International and National Nature Conservation Designations

11.6.89 The potential impacts and resultant effects relating to air emissions on the identified relevant international and national nature conservation designations are assessed in **Chapter 8**: Air Quality (PEI Report Volume I).

11.6.90 A potentially significant air quality impact as a result of emissions of ammonia has been identified for three statutory nature conservation designations of national nature conservation value. These designations are:

- Risby Warren SSSI;
- Broughton Alder Wood SSSI; and
- Broughton Far Wood SSSI.

11.6.91 The background ammonia concentrations at the Risby Warren, Broughton Alder Wood and Broughton Far Wood SSSIs are already exceeding the critical level for these designations. This exceedance results because the Air Pollution Information System (APIS) (UK Centre for Ecology and Hydrology, 2020) identifies a need for assessment against the lower of the two critical levels for ammonia (i.e. 1µg/m^3 for vegetation important for bryophytes (mosses and liverworts) and lichens), rather than using the more typically appropriate higher critical level (3µg/m^3). Operational emissions from the Proposed Development will result in a further small exceedance over this critical level. APIS requires use of the lower critical level for ammonia because these designations are considered to support habitats important for bryophytes (mosses and/or liverworts) and lichens, although in some cases the reasons for this are not clear (see below).

11.6.92 The most recent condition assessment for Risby Warren SSSI indicates that this site, and the management unit closest to the Proposed Development, is of unfavourable declining condition. This is due, in large part, to atmospheric pollution and nitrogen deposition. The SSSI used to support notable lichen-rich acid grassland, but this is no longer present due this historic and ongoing atmospheric pollution. Therefore, ammonia emissions from the Proposed Development would not cause the loss of notable lichen-rich acid grassland, as this has already been lost. Instead, it would represent an additional constraint on the potential to restore this habitat and the condition of the SSSI. Without evidence that the existing air quality issues, and ammonia exceedance, can be addressed and reduced to a more favourable level, it cannot be certain that the Proposed Development has any bearing on the ability to restore the SSSI to favourable condition. APIS indicates that trends for nitrogen deposition and ammonia concentration have been broadly stable over a 12 year period between 2005 and 2017 (more recent data is not available), so at present there is no evidence that an improvement in baseline air quality can be achieved or that this would be compromised by operation of the Proposed Development.

11.6.93 In this context, and until any major improvement in wider air quality is achieved or otherwise demonstrated to be feasible, it is very unlikely that lichen-rich acid grassland could be re-established. Baseline ammonia concentrations already grossly exceed the lower critical level set for lichen-rich habitats. Therefore, and in this context, the potential air quality effect from the additional small contribution of 0.02µg/m^3 to the already adverse background concentration of 2.5µg/m^3 ammonia at Risby Warren SSSI is considered neutral and not significant. The ammonia concentration at the SSSI otherwise remains below the higher critical level for habitats that are not important for bryophytes and lichens.

11.6.94 Currently the ability to assess the potential impacts and effects from the exceedance of the ammonia critical load at Broughton Alder Wood and Broughton Far Wood SSSIs is limited by the lack of information on why bryophytes and/or lichens are considered relevant. APIS identifies that both SSSIs support woodland habitats with bryophytes and lichens, but this might reasonably be expected of any woodland. Without clarification of the relevant features of concern, this does not automatically

indicate the presence of a notable or sensitive assemblage of such species, and no information is available to permit clarification of this. The SSSI citations do not indicate that bryophytes and lichens are of specific relevance to the reasons for designation and they do provide sufficient context to inform assessment. Instead, the overwhelming impression from the citations is that bryophytes and lichens are part of the incidental interest of these woodlands (as with any woodland) rather than having specific relevance to the reasons for designation on these SSSIs. If this is the case, then the higher critical level of 3µg/m^3 would be more appropriate for assessment purposes and the Proposed Development would not exceed this critical level.

11.6.95 Assuming that there is a valid basis for use of the lower critical level, there is no clear evidence that the existing baseline gross exceedance of this is adversely affecting these two SSSIs. The condition assessments published by Natural England for both SSSIs indicate that the woodland habitat of Broughton Alder Wood SSSI is in unfavourable recovering condition due only to dominance of the habitats present by a non-native plant species, and that Broughton Far Wood SSSI is in favourable condition. The current condition of these SSSIs has been achieved/maintained despite existing baseline ammonia concentrations being markedly above the lower critical level (at 2.86 and 2.48µg/m^3 respectively), and the condition assessments do not identify air quality as a relevant constraint on current condition. In this context, there is no evidence that the very small additional contribution of ammonia (0.02µg/m^3 at both sites) from the Proposed Development would adversely affect the integrity of these SSSIs. The effect is therefore considered to be neutral and not significant. The ammonia concentration at the SSSI otherwise remains below the higher critical level for habitats that are not important for bryophytes and lichens, and this may be a more appropriate basis for assessment given the lack of published information on the purported bryophyte and lichen interest features.

11.6.96 Air quality impacts during operation of the Proposed Development are not likely to have an adverse effect the integrity of the Humber Estuary designations. This is because all of the most sensitive habitats, as identified in the APIS, are located at distance from the Proposed Development in the vicinity of the Humber Estuary and do not occur along the River Trent in proximity to the Proposed Development. The closest relevant habitat to the Proposed Development, and present along the River Trent, is the '*Phragmites australis - Urtica dioica* tall-herb fen' community and this is not considered sensitive to nitrogen deposition and has otherwise been assessed for ammonia. Following modelling and assessment, as presented in **Chapter 8:** Air Quality (PEI Report Volume I), the predicted air quality effect on Humber Estuary SAC, Ramsar and SSSI of international/ national nature conservation value is demonstrated to be neutral and not significant.

11.6.97 No significant adverse air quality effects are predicted for any of the other, more distant, statutory nature conservation designations following assessment in **Chapter 8:** Air Quality (PEI Report Volume I).

11.6.98 Engineering design and air quality modelling and technical assessment will continue, and any further results will be confirmed in the ES to accompany the Application.

11.6.99 **Chapter 12:** Water Resources and Flood Risk assesses the potential water quality impacts and effects on the relevant international and national Humber Estuary nature

conservation designations and their associated species and habitat features of interest. This includes assessment of potential water abstraction from the River Trent, should abstraction from the Stainforth and Keadby Canal not be feasible and of treated water to the River Trent. The assessment includes consideration of potential physico-chemical effects from residual biocides within the cooling water blowdown returned and thermal uplift affects due to the increased temperature of returned cooling water.

11.6.100 It is noted that the abstraction and discharge of cooling water will require a permit from the Environment Agency, which will specify the volumes and rates of abstraction, and the effluent quality of discharged waters required to maintain the biodiversity and nature conservation status of the River Trent and the Humber Estuary designations. Cooling water will be monitored prior to discharge in compliance with the conditions of this permit. Given these controls, discharged water will not contain pollutants, including biocides used to treat zebra mussel, at concentrations which could give rise to significant environmental effects and no impacts on water availability or chemical water quality are predicted. As such, no adverse effects on the Humber Estuary nature conservation designations are predicted. The application of existing statutory regulatory regimes and permitting is sufficient to prevent this.

11.6.101 No other pathways are identified that could result in adverse impacts and effects on statutory nature conservation designations.

Local Nature Conservation Designations

11.6.102 The potential impacts and resultant effects relating to air emissions on the identified relevant LWS within 2km of the Proposed Development are assessed in **Chapter 8**: Air Quality (PEI Report Volume I).

11.6.103 This assessment confirms that air quality impacts during operation of the Proposed Development are not likely to have an adverse effect on the structure or function of habitats associated with these designations. The predicted effect on all local designations of county nature conservation value is therefore neutral and not significant.

11.6.104 Engineering design and air quality modelling and technical assessment will continue, and any further results will be confirmed in the ES to accompany the Application.

11.6.105 The abstraction of cooling water (if required) from the Stainforth and Keadby Canal LWS will require a permit from the Environment Agency, which will specify the volumes and rates of abstraction required to maintain the biodiversity and nature conservation status of the Stainforth and Keadby Canal LWS. **Chapter 12:** Water Resources and Flood Risk identifies no likely significant effects on the Stainforth and Keadby Canal LWS. Given this, no impacts on water availability or chemical water quality are likely, so no adverse effects on the LWS are predicted. The application of existing statutory regulatory regimes and permitting is sufficient to prevent this.

11.6.106 No other pathways are identified that could result in adverse impacts and effects on statutory nature conservation designations.

Acid Grassland Habitats and Open Mosaic Habitats on Previously Developed Land

11.6.107 The former Keadby Ash Tip contains 7.9ha of unimproved acid grassland habitat and 15.4ha of OMH. These habitats have been assessed as having national value (see **Appendix 11C**, PEI Report Volume II). The acid grassland and OMH are both considered sensitive to potential effects of emissions to air from operation of the Main Site, with the acid grassland located closest being 60m south-east of the Main Site. In particular, ammonia and deposition of nutrient nitrogen could result in changes to the species composition and structure of the grassland (trend towards a more enriched community of more rank structure and with less bare ground), with a consequent decline or loss of less competitive species, including a notable ephemeral plant assemblage and high cover of lichens.

11.6.108 To ensure a robust approach to assessment, the potential impacts and resultant effects relating to air emissions on the identified unimproved grassland and OMH habitat directly adjacent to the Proposed Development Site on the former Keadby Ash Tip has been assessed in **Chapter 8**: Air Quality (PEI Report Volume I).

11.6.109 This confirms that air quality impacts are not likely to have an adverse effect on the structure or function of habitats associated with the unimproved acid grassland and/or OMH. The predicted effect on these habitats of national nature conservation value is therefore neutral and not significant.

11.6.110 Engineering design and air quality modelling and technical assessment will continue, and any further results will be confirmed in the ES to accompany the Application.

Fish

11.6.111 No regular in-channel maintenance activities are anticipated as necessary at the water intake and outfall structures during operation, consistent with the current maintenance arrangements for the existing operational structures on the River Trent. Any requirements for in-channel maintenance works (e.g. dredging/ desilting) would be subject to established statutory regulatory procedures and are not likely to result in significant effects on fish or other aquatic biodiversity. This assessment is in accordance with the conclusions of the Keadby 1 Power Station WFD Assessment Report (AECOM, 2015) prepared to meet the requirements of the MMO in relation to dredging operations at the locations of the existing water intake and outfall structures. Accordingly, as established previously and agreed with the MMO, maintenance activities are not likely to result in significant adverse effects on fish.

11.6.112 WFD Screening Assessment for the Proposed Development has been prepared and is included in **Appendix 12B** (PEI Report Volume II). This identifies and assesses the relevant watercourses for which it will be necessary to demonstrate no deterioration in any of the identified baseline classifications, and no prevention of future improvement for these classifications. Further information will be provided in the ES to accompany the Application.

11.6.113 Similarly, as stated above in the assessment of operational impacts effects on nature conservation designations, it must be assumed that abstraction and discharge rates and volumes would be appropriate to maintain (as relevant) the physico-chemical and biological water quality of the River Trent and the Stainforth and Keadby Canal. This is because abstraction and discharge would require a permit from the

Environment Agency, with abstraction and discharge rates and quality required to demonstrate compliance with BAT for the watercourses concerned. Given this, water abstraction and discharge for the Proposed Development is not considered likely to have a significant effect on fish or their habitats.

11.6.114 The potential for fish entrainment and impingement would also be controlled through agreement of appropriate eel/ fish screens with the relevant regulators, in combination with agreement of appropriate abstraction rates and volumes. As such, this is again a matter that does not require further assessment. Existing statutory regulatory regimes are considered appropriate to avoid significant adverse effects on fish from entrainment and impingement.

11.6.115 Biocides will need to be used to prevent the clogging of water supply pipework by aquatic organisms, including the INNS zebra mussel, and potential pathways for residual biocides to be discharged to the River Trent need to be considered in relation to their potential to affect fish. Based on the evidence presented for Keadby 2 Power Station (Environmental Resources Management, 2019) it is considered that correct application of existing statutory regulatory regimes and permitting is sufficient to remove the potential impact pathway associated with the use of biocides, and consequently there would be no likely significant adverse effect on fish. Discharge of cooling water will require a permit from the Environment Agency, which will specify the effluent quality required, including consideration of biocides, to maintain the status of the receiving waters. Cooling water will also be monitored prior to discharge to comply with the conditions of this permit. Discharged water will therefore not contain pollutants at levels likely to impact upon the chemical water quality of the River Trent.

11.6.116 The Proposed Development will discharge cooling water to the River Trent. The temperature of the cooling water discharge and its implications for the temperature of the River Trent is considered in **Chapter 12**: Water Resources and Flood Risk. As discharge would be via existing infrastructure, the cooling water will be mixed with cooling water from Keadby 2 Power Station at source and therefore the predicted discharge temperature represents the worst-case in-combination scenario.

11.6.117 As a worst case, it is considered that a significant change in river water temperature from the addition of cooling water from the Proposed Development could have potential to impact both the existing WFD status of the River Trent, and achievement of the legally required good ecological status by 2027 and/ or impact fish through:

- thermal barriers or impact on habitat suitability, including potential implications to fish migration; and
- changes in chemical status as a result of increased temperature, including concentration of dissolved oxygen.

11.6.118 Such thermal impacts would be unlikely to have an adverse effect on the conservation status of most species of fish using the River Trent catchment. Instead, it would be a localised effect at up to the local scale only. The exception to this would be any impact on migratory fish species, given the Proposed Development is located at an important position between the Humber Estuary and the wider River Trent catchment. If an impact of sufficient magnitude and/ or regularity occurred, sufficient

to deter or obstruct migratory fish movements during critical periods, then potentially an effect might be realised that is significant at the regional scale.

11.6.119 The above acknowledged, this is another matter that is subject to regulatory regimes and permitting. Therefore while there is a need for the Applicant to demonstrate that appropriate cooling water discharge temperatures can be achieved to maintain biological and chemical water quality (this information will accompany the Application), it must be assumed that the existing statutory regulatory regimes will be applied appropriately to ensure that cooling water can and will be returned to the relevant watercourses at an appropriate temperature to avoid potential for adverse impacts and effects on fish and the wider ecology of the watercourses concerned.

11.6.120 The preliminary results provided in **Chapter 12**: Water Resources and Flood Risk confirm that the scenario of discharges from the Proposed Development and Keadby 2 Power Station is likely to result in a negligible impact to the temperature status of the River Trent, and the discharge would not prevent a barrier to migratory routes for fish.

11.6.121 The Proposed Development will replace the existing discharge from Keadby 1 Power Station through the use of the existing infrastructure. Given the requirements of existing statutory regulatory and permitting regimes it is considered that there are no impact pathways likely to result in an adverse operational effect on the conservation status of fish populations in either the River Trent or the Stainforth and Keadby Canal. The potential effect is therefore assessed as **neutral (not significant)**.

Bats

11.6.122 Operation of the Proposed Development requires new external lighting at the location of the Main Site. Operational lighting can be detrimental for bats if poorly designed and located in proximity to habitats of importance for bats e.g. important foraging habitats or movement corridors providing access to important foraging habitats. Light spill and glare can deter bats from accessing affected preferred habitats, and by so doing force bats to use habitats that are less suitable for foraging or expend more energy to go around the lit areas to access foraging habitats.

11.6.123 At the location of the Main Site, surveys in 2017 and 2020 recorded only very low levels of activity by common bat species (see **Appendix 11E**, PEI Report Volume II). The species recorded comprised those known to be more tolerant to artificial lighting. The low bat activity recorded is considered a function of the limited habitat quality at the Main Site and the extensive availability of suitable habitats in the wider landscape.

11.6.124 As described in **Chapter 4**: Proposed Development, PEI Report Volume I) an Indicative Lighting Strategy will accompany the Application, setting out how lighting impacts on sensitive ecological receptors, including bats, have been considered and addressed.

11.6.125 Given the existing very low levels of bat activity in association with the Main Site and the commitment to sensitive design of external artificial lighting, operation of the Main Site is not likely to affect the conservation status of any bat species. The effect on bats from external lighting required for operation of the Proposed Development is assessed as **neutral (not significant)**.

Terrestrial Invertebrates

11.6.126 Air quality impacts have been assessed in **Chapter 8:** Air Quality (PEI Report Volume I), where it is concluded that operation of the Proposed Development is not likely to have an adverse effect on the structure or function of habitats associated with the unimproved acid grassland and/or OMH. Given this, there are no likely impacts and effects on the notable (national value) terrestrial invertebrate assemblage of the former Keadby Ash Tip that is dependent upon these habitats. The effect on terrestrial invertebrates from operation of the Proposed Development is therefore assessed as **neutral (not significant)**.

Flora

11.6.127 Air quality impacts have been assessed in **Chapter 8:** Air Quality (PEI Report Volume I), where it is concluded that operation of the Proposed Development is not likely to have an adverse effect on the structure or function of habitats associated with the unimproved acid grassland and/or OMH. Given this, there are no likely impacts and effects on the notable (regional value) flora of the former Keadby Ash Tip that is dependent upon these habitats. The effect on flora from operation of the Proposed Development is therefore assessed as **neutral (not significant)**.

Invasive Non-native Species of Plants and Animals

11.6.128 Operation of the Proposed Development is not considered likely to result in the spread of plant and animal INNS. The only likely potential pathway for such spread relates to aquatic INNS and this is via the Potential Canal Water Abstraction Option from the Stainforth and Keadby Canal, which after operational use would then be routed to the existing Water Discharge Corridor outfall on the River Trent.

11.6.129 The potential for aquatic plant INNS (Nuttall's waterweed, see **Appendices 11C** and **11G**, PEI Report Volume II) to be drawn into the water supply via the Potential Canal Water Abstraction Option on the Stainforth and Keadby Canal will be obstructed at source due to the requirement for use of eel screens at the water intake in order to comply with The Eels (England and Wales) Regulations 2009 (as amended.

11.6.130 In the unlikely event that aquatic plant INNS could survive passage through the water supply pipework to reach the River Trent, it is unlikely that this would pose a specific threat to the ecology of the River Trent downstream of the outfall structure. This is because these freshwater species will already be present in the River Trent, if in the unlikely event they can persist in brackish tidal waters, due to existing habitat connections and permeability via boat movements and Keadby Lock. Given the known wide distribution of this species within the Trent Catchment (Botanical Society of Britain and Ireland, 2020), there are also numerous existing upstream sources for the relevant plant INNS along the River Trent.

11.6.131 A similar rationale can be presented for the aquatic animal INNS (Zebra mussel and demon shrimp, see **Appendix 11G**, PEI Report Volume II) recorded from the Stainforth and Keadby Canal. The existing permeability of the water supply between the canal and the River Trent via Keadby Lock already permits the spread of these species into the River Trent, and this will be further facilitated by existing boat movements.

11.6.132 Irrespective of the existing pathways which may exist via watercourse connections, it is also reasonable to assume that the application of routine precautionary measures, e.g. biocidal treatments of the water supply, will be applied to prevent the establishment of zebra mussel within the water supply pipework. Such measures are required to prevent zebra mussel from representing a significant constraint on operation of the Proposed Development, due to the potential for larvae to be drawn into the water supply (likely to be too small to be effectively screened out at source) and then settling and developing into adults within and blocking pipework. Application of such measures will remove this potential pathway for spread.

11.6.133 No likely significant impacts and effects from plant and animal INNS are therefore anticipated as a result of operation of the Proposed Development.

Decommissioning

11.6.134 The potential for adverse decommissioning impacts and effects on relevant biodiversity and nature conservation features is limited by the nature of the proposed decommissioning activities. As described in **Chapter 4**: The Proposed Development, at the end of its operating life, it is anticipated that all above ground infrastructure would be removed to ground level, and hardstanding and sealed concrete areas will be left in place. Any areas of the Proposed Development that are below ground level will be backfilled to ground level to leave a levelled area and it is anticipated that buried pipelines will be capped and left in situ. Therefore, there will be no requirement to remove or disturb habitats to remove buried infrastructure, and no species associated with these habitats will be affected.

11.6.135 Requirements to remove above ground infrastructure means that decommissioning activities would be predominantly restricted to within the built footprint of the Proposed Development. Therefore, in most cases decommissioning activities will be able to avoid vegetated areas or otherwise would only affect localised areas of vegetation immediately adjacent to built infrastructure. This would limit the potential for impacts on relevant habitats and species, such that they are less than the construction phase (which requires habitats to be cleared to create space to construct the Proposed Development). The resulting effects on ecological features are therefore likely to be reduced.

11.6.136 Where vegetation is affected, it is most likely to be soft landscaping planted for, or otherwise managed within the context of, the Proposed Development. Some of this vegetation could have established a biodiversity value that would need to be addressed during decommissioning in accordance with planning policy and legislation at that time e.g. a value for protected species.

11.6.137 No adverse air quality or hydrological impacts and effects on terrestrial ecology are likely, given decommissioning activities are comparable with, or of reduced magnitude compared with, construction activities. No significant adverse effects were predicted for construction and none are therefore predicted for decommissioning.

11.6.138 As described in section 11.5, decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of closure of the Proposed Development. A DEMP will be produced and agreed with the

Environment Agency as part of the Environmental Permitting and site surrender process. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. Ecological surveys will be commissioned as appropriate to inform the scope of the DEMP. This is discussed further within **Chapter 4**: Proposed Development (PEI Report, Volume I).

11.6.139 On this basis, no significant adverse effects are anticipated as a result of the decommissioning of the Proposed Development.

11.7 Mitigation and Enhancement Measures

Construction Mitigation

11.7.1 The assessment as presented herein indicates that the Proposed Development is not anticipated to generate any significant adverse effects during construction. Therefore, no measures additional to those as indicated in Section 11.5 are considered to be necessary.

11.7.2 Section 11.5 describes the embedded mitigation measures that will be undertaken to avoid adverse direct effects on habitats and species and to ensure legal compliance. In summary, these include:

- A Water Vole Mitigation Strategy will be prepared and agreed with relevant stakeholders to specify the measures and supervision required to deliver legislative compliance during construction of the Main Site and watercourse crossings. It is proposed that submission and approval of the Water Vole Mitigation Strategy will be secured by a Requirement of the draft DCO.
- Typical construction risk management and avoidance measures for nesting birds.
- A Fish Management Plan will be prepared and agreed with relevant stakeholders to specify the measures and supervision required to deliver legislative compliance during installation and drawdown of any cofferdam(s) for the upgrade of the River Water Abstraction Option (if chosen) on the River Trent and the Canal Water Abstraction Option on the Stainforth and Keadby Canal. It is proposed that submission and approval of the Fish Management Plan will be secured by a Requirement of the draft DCO/Marine Licence.
- Vegetation clearance and construction excavations have potential to affect wildlife and may result in offences under animal welfare legislation. An ECoW would be employed to supervise all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance.
- All excavations would be covered overnight, or where this is not practicable, a means of escape would be fitted e.g. battered soil slope or scaffold plank, to provide an escape route should any animals (e.g. reptiles, badger, otter, brown hare, hedgehog) stray into the construction site and fall into an excavation.
- A plant INNS survey will be undertaken prior to construction to determine the current location and extent of plant INNS, and to inform specification of the ISMP. If determined as necessary through this survey and after consideration of other available plant and animal INNS data, an ISMP will be prepared to accompany

the final CEMP and would be agreed with relevant stakeholders. The ISMP would specify the measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations. It is proposed that submission and approval of the ISMP will be secured by a Requirement of the draft DCO.

Decommissioning Mitigation

11.7.3 Any necessary mitigation requirements would be determined and agreed at a future date prior to decommissioning. As part of this process, the Applicant would provide a DEMP. Relevant habitat and protected species surveys would be undertaken to inform the specification of relevant working methods and mitigation in the DEMP. This is discussed further within **Chapter 4**: Proposed Development (PEI Report, Volume I)

Enhancement

11.7.4 An outline Landscape and Biodiversity Management and Enhancement Plan (LBMEP) will be developed in consultation with stakeholders and provided with the final Application. This would set out biodiversity enhancement proposals and the habitat management and monitoring considered necessary to deliver these. It is proposed that submission and approval of the final LBMEP will be secured by a Requirement of the draft DCO.

11.7.5 It is proposed that the approach to be taken for demonstrating and agreeing a gain for biodiversity will be discussed further and agreed during pre-application consultations with relevant stakeholders to ensure that this is appropriate to the specifics of a Proposed Development Site and is otherwise responsive to the management needs and priorities for existing habitats on adjacent land within the Applicant's control.

Monitoring

11.7.6 The measures proposed to avoid and reduce, where possible, significant adverse effects on biodiversity and nature conservation features are set out above. Monitoring requirements to track compliance with these commitments during construction will be set out in the Framework CEMP that will accompany the Application. In particular, an ECoW would be employed to oversee the delivery of all necessary mitigation, including any mitigation to be completed under protected species mitigation licences.

11.7.7 Requirements for post-construction monitoring of the establishment of landscape and biodiversity enhancement measures will be set out in the LBMEP to accompany the Application and subsequently approved and secured by a Requirement of the draft DCO (see Enhancement, above).

11.8 Summary of Likely Significant Residual Effects

11.8.1 No significant adverse residual construction, operation or decommissioning effects are anticipated as a result of construction of the Proposed Development.

11.9 Limitations or Difficulties

11.9.1 Baseline conditions and relevant biodiversity and nature conservation features have been determined using appropriate methods. Where surveys have not been possible at the time of preparation of the EcIA (the only relevant omission is a water vole survey of Glew Drain due to inform potential requirements, if required, for an upgrade to an existing bridge crossing and installation of an Electrical Connection option), then an appropriate precautionary (worst-case) assessment has been made with reference to the data available at the time of assessment.

11.9.2 For the purposes of this assessment and pending further information on the layout of the Main Site, it is assumed that all semi-natural habitats present within the Main Site would be lost during construction. Potential construction laydown options remain under consideration at the time of this assessment (**Chapter 5**: Construction Programme and Management) but this is not considered a difficulty or constraint given that all options under consideration are included within the indicative Proposed Development Site boundary (refer to **Figure 3.2** in PEI Report Volume III).

11.9.3 Where the full assessment of impacts from the construction/ operation of the Proposed Development is not possible at the time of this assessment due to reliance on ongoing modelling or analysis, this has been made clear in the text in the relevant section.

11.10 Conclusions

11.10.1 The Proposed Development has been sensitively designed and positioned with reference to the existing baseline conditions and potential pathways for impact. As a consequence, no significant adverse effects on biodiversity and nature conservation are predicted.

11.11 References

AECOM (2015) *Keadby Power Station Water Framework Directive Assessment Addendum*.

Botanical Society of Britain and Ireland (BSBI) (2020) BSBI Distribution Database. Available online at: https://database.bsbi.org/maps/

CIEEM (2019). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Version 1.1. Winchester: Chartered Institute of Ecology and Environmental Management.

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

Department of Energy and Climate Change (2011). *National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2).* London: The Stationery Office.

Department for Environment, Food and Rural Affairs (2011) *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*. Available online at:

https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

Elliott, M. Nedwell, S., Jones, N.V., Read, S.J., Cutts, N.D. & Hemingway, K.L. (1998) *Intertidal Sand and Mudflats & Subtidal Mobile Sandbanks: An Overview of Dynamic and Sensitivity Characteristics for Conservation Management of Marine SACs*. Institute of Estuarine and Coastal Studies, University of Hull.

Environmental Resources Management (2019) Keadby 2 Power Station Environmental Permit Variation: Supporting Information. Available online at: https://consult.environment-agency.gov.uk/psc/dn17-3ef-keadby-generation-limited/supporting_documents/Supporting%20Information.pdf

Hendry, K. & Cragg-Hine, D. (2003) *Ecology of the Atlantic Salmon*. Conserving Natura 2000 Rivers Ecology Series No. 7. English Nature, Peterborough.

Institute of Air Quality Management (2020). *A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites, Version 1.1* [Online]. Available from: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf

Lincolnshire Biodiversity Partnership (2011) Lincolnshire Biodiversity Action Plan. Available online at: https://www.nelincs.gov.uk/wp-content/uploads/2016/02/201110-LincolnshireBAP-3rd-edition.pdf

Marine Management Organisation (2014) *Eastern Inshore Marine Plan*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312496/east-plan.pdf

Maitland PS (2003) *Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5*. English Nature, Peterborough.

Ministry of Housing, Communities and Local Government (2019) *National Planning Policy Framework*. Available online at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

Natural England (2014) *National Character Area Profile 39 (NE339): Humberhead Levels*. Available online at: http://publications.naturalengland.org.uk/publication/1843305

Natural England (2020) *Biodiversity Metric 2.0: Technical Guidance for Intertidal Habitats*. Natural England Joint Publication JP029. Available online at: http://publications.naturalengland.org.uk/publication/5850908674228224

North Lincolnshire Council (2003a) *North Lincolnshire Local Plan*. Available online at: https://www.northlincs.gov.uk/planning-and-environment/planning-policy-the-north-lincolnshire-local-plan/

North Lincolnshire Council (2003b) *North Lincolnshire Supplementary Planning Guidance 3*. Available online at: https://www.northlincs.gov.uk/planning-and-environment/planning-policy-the-north-lincolnshire-local-plan/#1591174408063-04058386-d3ff

North Lincolnshire Council (2011) *North Lincolnshire Council Local Development Framework Core Strategy*. Available online at: http://www.northlincs.gov.uk/planning-and-environment/planning-policy-local-development-framework/

Planning Inspectorate (2017) *Planning Inspectorate Advice Note Seven (Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping). Version 6 December 2017*.

Transport for London (2016) *Silvertown Tunnel Underwater Noise Assessment*. Available online at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010021/TR010021-000202-6.3%20ES%20Appendix%2010.C.pdf