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11. BIODIVERSITY AND NATURE CONSERVATION

11.1. Introduction

11.1.1. This chapter of the Environmental Statement (ES) 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. Due to the interdisciplinary nature of effects, this chapter cross references other chapters and reports including the **Habitats Regulations Assessment (HRA) Appropriate Assessment Report** (**Application Document Ref. 5.2**), and **ES Volume I Chapter 8**: Air Quality, **ES Volume I Chapter 9**: Noise and Vibration and **ES Volume I Chapter 12**: Water Environment and Flood Risk (**Application Document Ref. 6.2**) and is supported by the following technical appendices provided in **ES Volume II** – **Application Document Ref. 6.3** which include a number of 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 (PEA) Report
- **Appendix 11D** – Confidential Badger Survey Report
- **Appendix 11E** – Riparian Mammal Survey Report
- **Appendix 11F** – Aquatic Ecology Survey Report
- **Appendix 11G** – Breeding Bird Survey Report
- Tree Survey Report (appended to the Outline Landscape and Biodiversity Enhancement and Management Plan Report **Application Document Ref. 5.11**)

11.1.3. **ES Volume III Figure 11.1**: Statutory Nature Conservation Designations and **ES Volume III Figure 11.2**: Non-Statutory Nature Conservation

Designations (**Application Document Ref. 6.4**) also accompany this chapter.

11.1.4. The cumulative effects of emissions associated with the Proposed Development and other committed developments in the vicinity are described in **ES Volume I Chapter 21**: Cumulative and Combined Effects (**Application Document Ref. 6.2.21**).

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 **ES Volume II Appendix 11A:** Legislation and Planning Policy (**Application Document Ref. 6.3**).

Biodiversity and Nature Conservation 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') (UK Government, 2017);
- Wildlife and Countryside Act 1981 (as amended) (the WCA) (UK Government, 1981);
- Environment Act 2021 (as amended) (UK Government, 2021);
- The Hedgerows Regulations 1997 (UK Government, 1997);
- Natural Environment and Rural Communities (NERC) Act 2006 (as amended) (UK Government, 2006);
- Protection of Badgers Act 1992 (as amended) (UK Government, 1992);
- Animal Welfare Act 2006 (UK Government, 2006);
- Wild Mammals (Protection) Act 1996 (UK Government, 1996);
- The Eels (England and Wales) Regulations 2009 (as amended) (UK Government, 2009);
- Salmon & Freshwater Fisheries Act 1975 (as amended) (UK Government, 1975);
- Environmental Protection Act 1990 (UK Government, 1990); and
- Invasive Alien Species (Enforcement and Permitting) Order 2019 (UK Government, 2019).

National Planning Policy

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 Security and Net Zero, 2024a) 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 European Sites, other national and local nature conservation designations, protected species and 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) (Department of Energy Security and Net Zero, 2024b) provides relevant advice on the assessment and mitigation measures expected from applicants.

11.2.6. On 24 April 2025, DESNZ published a consultation on revisions to the NPS. Consultation on the amendments concluded on 29 May 2025. The Consultation is not anticipated to result in changes which would materially alter the conclusions as set out in this Chapter.

11.2.7. **Table 11.1** provides a summary of relevant NPS policy regarding biodiversity and explains where matters are assessed within this chapter.

Table 11.1: Summary of NPS advice relevant to biodiversity

Summary of NPS	Consideration within the Chapter
NPS EN-1	
Paragraph 5.4.17 states: "*Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally [i.e. European Sites], nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance*	Section 11.7

Summary of NPS	Consideration within the Chapter
for the conservation of biodiversity, including irreplaceable habitats."	
Paragraph 5.4.19 states: "*The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests*."	Sections 11.6 and 11.8
Paragraph 5.4.42 states: "*As a general principle, and subject to the specific policies below, development should aim to avoid significant harm to biodiversity and geological conservation interests, including through consideration of reasonable alternatives (as set out in Section 4.3 above). Where significant harm cannot be avoided, impacts should be mitigated and as a last resort, appropriate compensation measures should be sought*."	Sections 11.6 and 11.8
Paragraph 5.4.35 states: "*Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the proposed development. In particular, the applicant should demonstrate that*: • *during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;* • *the timing of construction has been planned to avoid or limit disturbance;* • *during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements;* • *habitats will, where practicable, be restored after construction works have finished;* • *opportunities will be taken to enhance existing habitats rather than replace them, and where practicable, create new habitats of value within the site landscaping proposals. Where*	Sections 11.6 and 11.8. Further, an Outline Landscape and Biodiversity Management and Enhancement Plan (LBMEP) Report accompanies the Application (**Application Document Ref. 5.11**).

Summary of NPS	Consideration within the Chapter
habitat creation is required as mitigation, compensation, or enhancement, the location and quality will be of key importance. In this regard habitat creation should be focused on areas where the most ecological and ecosystems benefits can be realised; and • *mitigations required as a result of legal protection of habitats or species will be complied with*."	
Paragraph 5.4.36 states: "*Applicants should produce and implement a Biodiversity Management Strategy as part of their development proposals. This could include provision for biodiversity awareness training to employees and contractors so as to avoid unnecessary adverse impacts on biodiversity during the construction and operation stages*."	Sections 11.6 and 11.8. Further, an Outline LBMEP Report accompanies the Application (**Application Document Ref. 5.11**).
Paragraph 5.4.37 states: "*In the design of any direct cooling system the locations of the intake and outfall should be sited to avoid or minimise adverse impacts on the receiving waters, including their ecology. There should also be specific measures to minimise impact to fish and aquatic biota by entrainment and impingement or by excessive heat or biocidal chemicals from discharges to receiving waters*."	**ES Volume I Chapter 12 :** Water Environment and Flood Risk (**Application Document Ref. 6.2**). Sections 11.6 and 11.8.
NPS EN-2	
Paragraph 2.4.30 notes that "*Where the project is likely to have effects on water quality or resources the applicant must undertake an assessment as required in Section 5.16 of 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*."	**ES Volume I Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**) and Section 11.6.

National Planning Policy Framework

11.2.8. The policies set out in the revised National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2025) are not specific to NSIP projects but may be important and relevant matters for DCO decision making. The NPPF sets out the Government's planning policies for England and how these are expected to be applied. It identifies overarching environmental objectives such as protecting and enhancing the natural environment, minimising impacts on and improving biodiversity and securing measurable net gains for biodiversity (paragraph 193). 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 **ES Volume II Appendix 11A:** Legislation and Planning Policy (**Application Document Ref. 6.3**).

Local Development Plan Policy

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

- Policies CS5, CS16 and 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; and
- Saved Policies LC1, LC2, LC4, LC5, LC6 and LC12 of the North Lincolnshire Local Plan adopted 2003 (North Lincolnshire Council, 2003a), which set out requirements regarding nature conservation designations, species and habitats.

11.2.10. Further information on the above relevant policies is provided within **ES Volume II Appendix 11A:** Legislation and Planning Policy (**Application Document Ref. 6.3**).

Other Guidance

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

- Planning Practice Guidance on biodiversity (MHCLG (2018 to 2021) and Department for Levelling Up, Housing and Communities (2018 to 2021), 2025) and biodiversity net gain (BNG) (MHCLG and Department for Levelling Up, Housing and Communities, 2024);

- National Pollinator Strategy (Defra, 2014);
- 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);
- Lincolnshire Biodiversity Action Plan (Lincolnshire Biodiversity Partnership, 2011);
- Standing Advice (Natural England and Defra, 2023); and
- National Character Area 39 Humberhead Levels (Natural England, 2025).

11.3. Assessment Methodology

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 (**ES Volume II Appendix 1B** (**Application Document Ref. 6.3**)) and in response to the formal consultation and other pre-application engagement, is summarised in **Table 11.2**.

Table 11.2: 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 (10 June 2024)	The ES should provide a description of the activities and works (including the anticipated duration) which are likely to be required during decommissioning which could impact ecological receptors and highlight any differences between the construction and decommissioning phases	This information is provided in Section 11.7 of this chapter.
		The Scoping Report proposes to assess air quality at operation only. The ES should also assess the impacts to air quality arising during the construction and decommissioning phases or demonstrate the absence of potentially significant effects.	An assessment is provided in Section 11.7 for all relevant phases with reference to the initial screening of air quality impacts within **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**).
		Potential spread of Invasive Non-Native Species (INNS) should be considered as an impact pathway as part of the assessment. The Inspectorate advises that the ES should identify and describe any	The requested information and assessment is provided within Sections 11.5 and 11.7 of this chapter and supporting **ES Volume II**

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		INNS present in the baseline and include an assessment if there is the potential for significant effects to occur	**Appendices 11C:** Preliminary Ecological Appraisal **and 11G:** Breeding Bird Survey Report (**Application Document Ref. 6.3**).
		The Inspectorate agrees that the Crowle Borrow Pits Site of Special Scientific Interest (SSSI) and the Hatfield Chase Ditches SSSI can be scoped out of any water environment impact assessment.	Noted, no further action required.
		The Inspectorate is content to scope out additional surveys for great crested newt and reptiles.	Noted, no further action required.
		The Inspectorate is content to scope out additional surveys for wintering and passage birds and white-clawed crayfish provided the findings of the PEA are evidenced in the ES, subject to evidence of the agreement with Natural England.	The relevant data is provided within **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**) and includes a third party data report which places the Site

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
			within the context of the local bird assemblage.
		The Applicant's attention is drawn to the list of Sites of Special Scientific Interest in paragraph 6.3 of Natural England response.	Noted, response provided against the relevant Natural England comment.
		The Applicant is directed to the consultation response from Natural England in Appendix 2 on potential impacts on European / nationally designated sites.	Noted, response provided against the relevant Natural England comment.
		Effort should be made to agree an approach to sediment sampling with the MMO and any other relevant consultation bodies.	Sediment sampling is not a matter of direct relevance to this chapter. The EcIA will be made with reference to the assessment of water quality impacts and effects within **ES Volume I Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**).

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		Temporary effects during construction and decommissioning and potential effects during operation to water quality, for example from spillages or discharges, should be considered in an assessment of this matter or otherwise demonstrate why significant effects are not likely to occur. Cross reference should be made to the assessment in the Surface Water, Flood Risk and Water Resources ES Chapter.	It is confirmed that this is the approach that has been taken in this chapter. The remit of the ecology assessment has been defined with reference to the findings of the assessments undertaken by other disciplines, including water, noise and air quality.
		The ES should assess any potential impacts from piling on ecological receptors where significant effects are likely to occur.	Piling has been considered within Section 11.7 of this Chapter.
		Specific survey and assessment data relating to the presence and locations of species such as badgers, rare birds and plants that could be subject to disturbance, damage, persecution, or commercial exploitation resulting from publication of the information, should be provided in the ES as a confidential annex.	Noted and agreed.

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
Canal and River Trust	Scoping opinion (22 May 2024)	The Trust take no specific issues with the section of the scoping report relating to potential impacts on sites, habitats and species. The Trust wish to comment on the Outline CEMP and soft landscaping proposals.	**The Outline CEMP (Application Document Ref. 7.4**) and soft landscaping proposals accompany the Application and the Trust has had opportunity to comment on these documents.
	Response to PEI Report (18 February 2025)	The Trust have no significant issue with the range of surveys undertaken to inform the Environment Statement.	No response required.
		Paragraph 11.5.16 of the PEIR concludes that no significant changes will occur for habitats during construction. However, the PEA does refer to broad leaved woodland is present, which could be affected – (11C.5.27). We request that clarity should be provided in the final submission as to whether this habitat will be impacted.	The only impact on woodland relates to the worst-case (pending detailed design) removal of 0.1ha or poor quality plantation woodland on Chapel Lane (habitat parcel 19) and 0.18ha of secondary broad-leaved woodland (habitat parcel 86) for construction of the Canal Water Abstraction. At the

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
			latter the woodland contains large clearings dominated by common nettle, and consequently tree loss is less than 0.27ha. This woodland loss would not meaningfully affect the structure and function of the remaining woodland so would not produce a significant effect. Refer to Section 11.7 for the impact assessment.
		11.5.20 and 11.5.21 of the PEIR discuss impacts during operation, including impacts due to water abstraction. Floating Pennywort is present within the Stainforth and Keadby Canal which is not listed within the INNS section. There is a risk that these species could spread in the future and impact abstraction. Mitigation to manage this species in the long term could be considered to help ensure the future	Floating pennywort was not observed during the survey. This species has been added to the list of relevant INNS and is considered within the mitigation strategy.

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		sustainable operation of the abstraction equipment.	
		Section 11.6 discusses mitigation practices during construction and operation. Whilst we have no issue in principle with the practices listed, we do request that clean dry and biosecurity controls should be included to ensure that mitigation practices are fully effective.	Biosecurity is addressed in the Application as committed within Sections 11.6 and 11.8 of this chapter. The relevant measures are specified within the appropriate documents of the Application, including **the Outline CEMP** (**Application Document Ref. 7.4**).
Environment Agency	Scoping opinion (24 May 2024)	The impacts of decommissioning need to be scoped in for Biodiversity and Nature conservation.	Decommissioning is addressed within Section 11.7 of this chapter.
		The timing of works to rivers will need to consider the effects on migratory fish, such as salmon and sea trout, to avoid disruption during migratory periods.	Works within the River Trent are no longer proposed following removal of the River Water Abstraction Option. Treated effluent will be mixed with the treated

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
			effluent from the existing Keadby 2 Power Station for discharge to the River Trent via the existing operational outfall and this is assessed in **ES Volume I Chapter 12** (**Application Document Ref. 6.2**) and Section 11.7 of this chapter.
		Any abstraction will need to ensure that best practice is adopted. This will include a fish screen with fine aperture installed to protect small eels (under the Eel Regulations 2009). The inlet structure arrangement will determine some of the specifics, such as the approach velocities required.	The intake structure would be constructed with equipment to comply with the Eels (England and Wales) Regulations 2009 (HMSO, 2009) ('the Eels Regulations'). It is expected that this will comprise 2mm multidisc eel screens (1.2bar) to minimise the risk to fish as they are returned. The system is , similar to that approved by the Environment Agency and

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
			that has been constructed for Keadby 2 Power Station.
		Other impacts on fish species will need to be considered, including changes to: water chemistry - including any discharges, nutrients, temperature - including thermal plume from discharges, aquatic vegetation, salination, physical barriers – entrapments, and anthropogenic disturbances.	Fish are considered within Section 11.7 of this chapter.
		Up-to-date surveys for water voles will be required. We note extensive populations are present in the drainage ditches surrounding the proposed development. The EIA should include an understanding of the water vole population, and a mitigation strategy to ensure the wider water vole population is not fragmented by the development	Surveys have been undertaken for water vole and are reported within **ES Volume II Appendix 11E:** Riparian Mammal Survey Report **(Application Document Ref. 6.3**). A suitable package of update surveys and outline mitigation requirements has been specified in Section 11.6 and the **Outline LBMEP Report** (**Application Document**

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
			Ref. 5.10) and these remain consistent with those agreed with Natural England for the consented Keadby CCS Power Station, for which the Proposed Development is an alternative.
		We expect to see a reptile and amphibian method statement – outlining reasonable avoidance measures to safeguard reptiles and amphibians that could come onto site.	An appropriate package of mitigation measures is committed as summarised within Section 11.6 of this chapter.
		We expect to see a Biosecurity plan in the Environmental Statement, and the Construction Environment Management Plan (CEMP).	This is committed within Sections 11.6 and 11.8 of this chapter. The relevant measures are specified within the appropriate documents of the Application, including the **Outline CEMP** (**Application Document Ref. 7.4**).

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		We will be interested in Biodiversity Net Gain (BNG) baselines and proposals for watercourses, ditches and any other wet habitat on site. Including TraC waterbodies (transitional). For a strategic approach to BNG, we encourage the applicant to research: Local Nature Recovery Strategies, River Basin Management Plans, Catchment Plans, Climate resilience, Water Framework Directive objectives for strategic approach to BNG.	Noted. BNG will be addressed in the Application.
Natural England	Scoping opinion (29 May 2024)	Advice provided on the scope of the EIA.	This chapter is consistent with the guidance provided in relation to biodiversity and nature conservation.
		The ES should thoroughly assess the potential for the proposal to affect internationally designated sites of nature conservation importance / European sites. The development site is within or may impact on the following	The identified designations have been considered by this chapter, with reference to the findings of the assessments undertaken by other disciplines, including water, noise and air quality.

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		European/internationally designated nature conservation site(s): • Humber Estuary Special Protection Area (SPA) • Humber Estuary Special Area of Conservation (SAC) • Humber Estuary Ramsar • Thorne Moor SAC • Thorne and Hatfield Moors SPA Table 2 [of Natural England's response] provides advice on potential impacts where further information is required to assess the potential impacts on internationally designated sites.	
		We note that the Scoping Report states that "a full assessment, which would also consider the measures needed to achieve 10% BNG, is not proposed to accompany the DCO application given that this is only mandatory for planning applications after determination as a pre-commencement	Noted. The Application includes a BNG Strategy as part of the **Outline LBMEP Report** (**Application Document Ref. 5.10**).

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		requirement." Whilst we acknowledge that BNG for NSIPs is not mandatory, we would still encourage the provision of as much BNG assessment as possible at an early stage to help ensure gains are maximised. It will allow any issues to be highlighted and addressed more easily and cost effectively. Early identification of areas of on-site and off-site habitat creation and enhancement is recommended. Best practice is for developers to submit a biodiversity gain plan and completed biodiversity metric with their application, with enhancements then being secured by requirements in the Development Consent Order (DCO).	
	Response to PEI Report (20 February 2025)	Update surveys for otter, badger and water vole should be undertaken prior to the start of construction as described.	As noted by Natural England, these surveys form part of the committed approach and will be secured through a pre-commencement requirement of the **Draft DCO**

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
			(**Application Document Ref. 3.1**).
		At this stage it is difficult to comment on the suitability of proposals without access to The Water Vole Impact Avoidance Strategy. Prior thought should be given to the receptor area(s) as a result of the 2024 surveys, which show Drain 1 to be at carrying capacity. Compensation or enhancement of areas may be required prior to the displacement of water voles if suitable adjacent habitat is unavailable. The mitigation strategy should ensure the wider water vole population is not fragmented by the development.	The mitigation for water vole will depend on the population status as pre-construction, so the current intention is to provide a framework for how water vole will be suitably addressed at that time. It is recognised that any necessary compensation or enhancement areas may need to be created in advance so that they are suitable for occupation by water voles displaced at construction. There are no works that would fragment water vole habitat, all drains that link different areas of water vole habitat will remain accessible.

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		Natural England would like to see an indication of the distances of construction works from any Main Setts, with detail on the type of construction proposed and its impacts to badgers before we can comment on whether disturbance licence would be required.	Please refer to **ES Volume II Appendix 11D:** Badger Survey Report (**Application Document Ref. 6.3**) for the relevant information. It is concluded that a development licence would not be required.
	Written representation (18 March 2026)	Further information requested in relation to the assessment of potential operational air quality impacts on statutory nature conservation designations.	The requested additional information and assessment has been incorporated into this chapter from paragraph 11.7.94 onwards. Minor amendment has also been made to the construction dust assessment (paragraphs 11.7.10 to 11.7.11) to align with the current iteration of the HRA.
North Lincolnshire Council	Late response to scoping opinion (28 May 2024)	Expects that the scope and content of the environmental statement (ES) to be guided considerably by the findings, consultees' comments and Examining Authority's	Noted. The EcIA has been informed by prior work for Keadby CCS Power Station DCO, which included

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		written questions for the Keadby CCS Power Station and, to a lesser extent, the recent haul road planning application	agreement of requirements in relation to relevant habitats and species, and identification of relevant securable biodiversity mitigation and enhancement.
		Agrees with the survey proposals. Agrees that reptiles and great crested newt can be scoped out.	Noted, no further comment required.
		Whilst not disagreeing with the technical correctness of the BNG approach set out in the Scoping Report, NLC strongly recommends the applicant to consider the measures needed to achieve 10% BNG at the application stage, to reassure consultees that net gain is deliverable practically and locally in accordance with the BNG hierarchy and local strategic priorities.	Noted. The Application includes a BNG Strategy as part of the **Outline LBMEP Report** (**Application Document Ref. 5.10**).

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
	Response to PEI Report (19 February 2025)	We would expect the scope and content of the environmental statement (ES) to be guided considerably by the findings, consultees' comments and the Examining Authority's written questions for the previous alternative Keadby CCS Power Station/Keadby 3 project.	The Proposed Development remains consistent with the commitments agreed for Keadby CCS Power Station (e.g. in relation to the Canal Water Abstraction, habitat retention, species protection etc). Consequently, the impacts and effects are comparable to those assessed and agreed previously.
		The Planning Inspectorate, as competent authority, will need to carry out a Habitats Regulations Assessment (HRA) of the project.	The scope and data needed for the purposes of HRA have been discussed and agreed with the Appropriate Nature Conservation Body (Natural England).
		Agrees that surveys for great crested newts, otter, bats (roosting), white-clawed crayfish and Schedule 1 bird species can	Noted, no further comment required.

Consultee or organisation	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		be scoped out of the EclA, based on the information provided. Agrees with the surveying proposed.	
North Lincolnshire Council	Site visit for ancient and veteran trees (18 September 2025)	Site visit with NLC Arboricultural Officer and Principal Arboricultural and Local Nature Reserves Manager to inspect and agree the status of potential veteran and ancient trees. NLC confirmed that T145 and T149 are not veteran trees and T152 and T154 are not ancient trees.	Noted, the classification of ancient and veteran trees has been updated. The Outline LBMEP Report (**Application Document Ref. 5.10**) (including appended Arboricultural Assessment, Tree Constraints Plan and Tree Protection Plan) and **Chapter 11**: Biodiversity and Nature Conservation (**Application Document Ref. 6.2.11**) have been updated accordingly.

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, 2024). Full details of the approach applied are provided in **ES Volume II Appendix 11B:** Ecological Impact Assessment Methods (**Application Document Ref. 6.3**), 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 because of the Proposed Development. EcIA does not encompass geological features so this is not within the scope of this chapter (instead refer to **ES Volume I Chapter 13**: Geology, Hydrogeology and Land Contamination (**Application Document Ref. 6.2)**;
- provide a scientifically rigorous and transparent assessment of the potential significant 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 **ES Volume II Appendices 11C** to **11G** (**Application Document Ref. 6.3**);
- 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 **ES Volume II Appendices 11C** to **11G** (**Application Document Ref. 6.3**);
- the changes or perturbations predicted to result because 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 (2024) makes clear that there 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.*" (paragraph 4.1)

11.3.5. 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, whilst the statutory BNG requirement makes this mandatory in relation to habitats.

11.3.6. 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 **ES Volume II Appendices 11C** to **11G** (**Application Document Ref. 6.3**). The value of each relevant biodiversity and nature conservation 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).

11.3.7. 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.

11.3.8. 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

11.3.9. The study areas used to gather baseline data for this assessment are consistent with those reported in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**). These study areas were specified to support collation of sufficient data to meet worst-case data needs for robust EcIA in accordance with Rochdale Envelope principles. These study areas were therefore generally precautionary.

11.3.10. The baseline data gathered has been reviewed to identify relevant ecological features that could interact with the Proposed Development in a manner sufficient to result in an adverse effect (i.e. ecological features within the 'zone of influence'). This chapter therefore does not address any identified ecological features for which there is no likelihood of an adverse effect as these are scoped out (refer to **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3)**

11.3.11. The relevance of each ecological feature identified has been considered case by case. Professional judgement has been used, based on understanding of the ecology and relative sensitivities of the features concerned and the relevant requirements of the Proposed Development that are likely to interact with them. It has also considered the requirements of regulatory stakeholders and other good practice guidance, the relative nature conservation importance of the features concerned, and any implications arising from relevant legal protections.

11.3.12. The potential distances over which the Proposed Development may interact with different ecological features can vary over time. For example, the construction zone of influence may be more or less that of the operational zone of influence. Typically, the zone of influence is greatest during construction but there can be significant exceptions to this, particularly when considering potential air quality impacts and effects. For example, regulatory stakeholders require assessment of potential operational air quality impacts and effects on all European Sites and other national nature conservation designations within 15km, but only require assessment of local non-statutory designations within 2km. These are therefore the good practice study areas adopted within this chapter for nature conservation designations.

11.3.13. The extent of the study areas applied during the desk study and field surveys are detailed within **Table 11.4** and **Table 11.5**.

Significance Criteria

11.3.14. 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.

11.3.15. 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).

11.3.16. The CIEEM approach described in **ES Volume II Appendix 11B:** EcIA Methodology (**Application Document Ref. 6.3**) broadly accords with the EIA methodology described in **ES Volume I Chapter 2**: Assessment Methodology (**Application Document Ref. 6.2**). However, the classification of effects matrix (Table 2.1 of Chapter 2) 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 ES as outlined in **Table 11.3**.

Table 11.3: Relating CIEEM assessment terms to those used in other ES chapters

Effect classification terminology used in other ES 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	Negligible	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.

Effect classification terminology used in other ES chapters	Equivalent CIEEM assessment
Major adverse	Adverse effect on structure/ function or conservation status at regional, national or international level.

Data Sources

11.3.17. The biodiversity and nature conservation baseline has been determined through a combination of desk study and field survey, as described in **ES Volume II Appendices 11C** to **11G** (**Application Document Ref. 6.3**) and summarised below.

Desk Study

11.3.18. A desk study was carried out to identify nature conservation designations and 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 11.4** and is reported in detail in the PEA report provided as **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**).

11.3.19. 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.

11.3.20. 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 (UK Government 1981 and 2019), and other relevant INNS were also collated and have been considered when assessing the potential ecological effects of the Proposed Development. However, it is not appropriate to attribute the same weight to these INNS as has been applied to other relevant biodiversity and nature conservation features when determining the likely significant effects of the Proposed Development. This is because the presence of INNS is generally detrimental for biodiversity and nature conservation, and conversely the removal of such species would usually be considered desirable and beneficial for biodiversity and nature conservation.

11.3.21. The need to control the movement and establishment of INNS is driven by the requirements of relevant legislation and permitting regimes, as well as the

wider implications of the species concerned e.g. their potential to damage or impede the commercial operation of the Proposed Development. Therefore, there is 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 11.4: Desk study area and data sources

Type of ecological feature	Desk study area	Data sources
European Sites e.g. candidate or designated SAC, Special Protection Area (SPA), Ramsar sites	15km	Multi-Agency Geographic Information for the Countryside (MAGIC) website (https://magic.defra.gov.uk/) (accessed February 2025)
National statutory nature conservation designations e.g. Site of Special Scientific Interest (SSSI)	15km	MAGIC website (accessed February 2025)
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 October 2024)
Protected and notable habitats and species[1]	1km	LERC (data received October 2024) Previous ecological survey information for the former Keadby

Type of ecological feature	Desk study area	Data sources
		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 ('the Site') and adjacent land contained within reports to the Applicant for Keadby 2 Power Station and Keadby Wind Farm. The Environment Agency Ecology and Fish Explorer Database (accessed July 2024).
Ancient and veteran trees	1km	LERC (data received October 2024) Ancient tree inventory website (https://ati.woodlandtrust.org.uk/tree-search) (accessed October 2024)

Field Surveys

11.3.22. The scope of works for necessary habitat and protected species surveys was determined and confirmed through a UK Habitat (UKHab) survey and PEA as described in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**).

11.3.23. The scope of the field surveys completed to inform the EcIA, described in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**), is summarised in **Table 11.5**. Full details of the scope

and methods for each survey are provided in **ES Volume II Appendices 11C** to **11G** (**Application Document Ref. 6.3**), as cross referenced in **Table 11.5**.

11.3.24. The baseline information on veteran and ancient trees has been sourced from the Tree Survey Report (appended to the **Outline LBMEP Report Application Document Ref. 5.11**).

Table 11.5: Ecological field surveys defining the baseline for the Proposed Development

Ecological survey	Appendix (ES Volume II)	Scope of survey	Survey date
Habitat/ Botanical (terrestrial)	11C	UK Habitat (UKHab) and Biodiversity Net Gain (BNG) site condition assessment surveys of land within the Site.	Completed 26th March 2024 to re-verify data originally gathered for Keadby CCS Power Station in 2020 and 2023. Additional walkovers of the Site were completed on the 28th and 29th August 2024. Inspection of watercourses for BNG purposes completed in September 2024.
Botanical (aquatic)	11F	Aquatic macrophyte surveys of relevant watercourses.	Completed 17th July 2017 (Keadby Ash Tip) and 15th July 2020 (other watercourses) for Keadby CCS Power Station. No change in watercourse habitats verified by original specialist surveyor on 30th May and 31st July 2023, and again on 26th March 2024 for the Proposed Development.
Aquatic invertebrates	11F	Aquatic macroinvertebrate surveys of relevant watercourses.	As above.
Badger	11D (confidential)	Suitable habitat for badger within, and at least 30m out from, the Site.	Completed 22nd April 2020 with supplementary inspection 15th July 2020 for Keadby CCS Power Station. Re-surveyed 22nd March 2023 for Keadby CCS Power Station. Reverified

Ecological survey	Appendix (ES Volume II)	Scope of survey	Survey date
			26th March 2024 for the Proposed Development.
Bats – roost appraisal	11C	Inspection of all suitable trees (no relevant buildings or structures) within the Site.	Completed 22nd March 2023, and 26th March 2024 for Keadby CCS Power Station. Data included in PEA report to support rationale for scoping out further bat surveys.
Bats – activity surveys	11C	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 with additional data gathered in 2023 for Keadby CCS Power Station. Data included in PEA report to support rationale for scoping out further bat surveys.
Breeding birds	11G	Five walked transects to record evidence of breeding within the Main Site and locations where woodland could be affected.	Completed 18th July 2024 for the Proposed Development.
Fish	11F	Environmental DNA (eDNA) survey of the Stainforth and Keadby Canal.	Completed 20th August 2024 for the Proposed Development.
Riparian mammals (water vole and otter)	11E	Early (spring) and late (summer) season surveys of relevant	First surveyed 2020, with top-up surveys on 30th May and 31st July 2023 for Keadby CCS Power Station, and a further

Ecological survey	Appendix (ES Volume II)	Scope of survey	Survey date
		watercourses within and adjacent to the Site boundary. Top-up survey prior to Application.	survey was completed on 28/29th August 2024 for the Proposed Development.
Terrestrial invertebrates	11C	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 for Keadby CCS Power Station. No substantive change in distribution of suitable habitats (all of which are off-site) re-verified 26th March 2024 for the Proposed Development.

11.4. Use of the Rochdale Envelope

11.4.1. For the purposes of the EcIA it is assumed that the majority of the Main Site (including ancillary facilities) and associated laydown areas shown in **ES Volume III Figure 3.3**: Indicative Parts of the Site Plan (**Application Document Ref. 6.4**) 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) presented in **ES Volume I Chapter 4**: The Proposed Development and **Chapter 5**: Construction Programme and Management (**Application Document Ref. 6.2**) therefore do not alter the parameters of the assessment of construction (or decommissioning) impacts on ecology, as they are worst-case.

11.4.2. For the assessment of air quality impacts during operation (and thereby the effects reported on the ecological features in this chapter), several worst-case assumptions have been included in the assessment to ensure that it is conservative. These relate to emission parameters, running hours, and selection of stack heights and stack locations (refer to Section 8.3 'Rochdale Envelope' of **ES Volume I Chapter 8**: Air Quality (**Application Document**

Ref. 6.2). The assessment of operational impacts presented in this chapter is therefore also based upon a worst-case.

11.4.3. **ES Volume I Chapter 9**: Noise and Vibration (**Application Document Ref. 6.2**) 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 Site to each relevant ecological feature. Where relevant, the assessment of potential noise and vibration disturbance impacts presented in this chapter is therefore also based on a worst-case.

11.5. Baseline Conditions

11.5.1. 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 **ES Volume II Appendices 11C** to **11F** (**Application Document Ref. 6.3**). These appendices should be referred to where more information is required on the grounds for scoping features in and out of the impact assessment.

European Sites and National Statutory Nature Conservation Designations

11.5.2. There are six European Sites[2] and 23 other national statutory nature conservation biodiversity and nature conservation designations within the study area relevant to the EcIA of the Proposed Development (as defined in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)). Most of these designations are located at distance from the Site but have been scoped in at this stage to meet good practice requirements for the assessment of potential operational air quality impacts

[2] European Sites, including European Marine Sites, are taken to encompass the following kinds of nature conservation designation: Special Areas of Conservation (SAC), candidate SAC (cSAC), possible SAC (pSAC), Special Protection Areas (SPA), potential SPA (pSPA) and Ramsar sites. Following the exit of the UK from the European Union, there has been a shift in terminology. Within England and Wales, European Sites (whilst still referred to as such in much of the published guidance) have been renamed as 'Habitats Sites'. For the purpose of this report, the established terminology, European Sites, has been followed.

and effects, as set out in **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**).

11.5.3. The relevance of the identified European Sites and other national nature conservation designations to the Proposed Development is summarised below in **Table 11.6** (in order of distance from the Site) based on the initial screening and rationale provided in **ES Volume II Appendix 11C** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**).

Table 11.6: 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 end point for the existing water discharge connection from Keadby 1 Power Station and the location of 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

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
Hatfield Chase Ditches SSSI	x	✓	x	3.4km south-west of Main Site
Eastoft Meadow SSSI	x	✓	x	3.7km north-west of Main Site
Thorne and Hatfield Moors SPA	x	✓	x	6.3km north-west of Main Site
Thorne Moor SAC	x	✓	x	6.3km north-west of Main Site
Thorne, Crowle and Goole Moors SSSI	x	✓	x	6.3km north-west of Main Site
Humberhead Peatlands NNR	x	✓	x	6.3km 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	9.8km 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

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
Hatfield Moors SSSI	x	✓	x	10.4km south-west of Main Site
Hatfield Moor SAC	x	✓	x	10.4km south-west of Main Site
Tuetoes Hills SSSI	x	✓	x	10.4km 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
Messingham Sand Quarry SSSI	x	✓	x	12.0km south-east of Main Site
Manton and Twigmoor SSSI	x	✓	x	12.2km south-east of Main Site
Scotton and Laughton Forest Ponds SSSI	x	✓	x	12.4km 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	13.9km east of Main Site

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
Scotton Beck Fields SSSI	x	✓	x	13.9km south-east of Main Site
Scotton Common SSSI	x	✓	x	14.0km south-east of Main Site
Laughton Common SSSI	x	✓	x	14.7km south of Main Site

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

11.5.4. There are 11 local non-statutory nature conservation designations within the study area relevant to the EcIA of the Proposed Development (as defined in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)). These designations are all of county nature conservation value.

11.5.5. In addition, the Proposed Development is located within a landscape identified as the Humberhead Levels Nature Improvement Area (NIA). This was one of 12 NIAs chosen by the Government to create joined up and resilient ecological networks at a landscape scale. The Proposed Development does not directly affect any land under active management for the NIA.

11.5.6. There are no statutory LNRs or ancient woodlands in the study area. The relevance of the identified non-statutory nature conservation designations to the Proposed Development is summarised below identified in **Table 11.7** (in order of distance from the Site) based on the initial screening and rationale

provided in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**).

Table 11.7: 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. Upstream of the Proposed Development. Crossed by the existing buried water discharge connection from Keadby 1 Power Station. No open cut construction works proposed to upgrade the pipeline.
Stainforth and Keadby Canal Corridor LWS	✓	✓	✓	The Canal Water Abstraction would take water from the LWS. It is also crossed by the access route over North Pilfrey Bridge. 0.3km south-east of Main Site.
Hatfield Waste Drain LWS	✓	x	✓	Crossed by the proposed Mabey Bridge replacement at the Site entrance.
Keadby Boundary Drain LWS	✓	✓	✓	Located adjacent to (and west of)

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
				and downstream of Main Site.
North Engine Drain, Belton LWS	✓	x	✓	20m south of the Site entrance.
River Torne LWS	✓	x	x	45m south of the Site entrance. Upstream of the Proposed Development.
South Soak Drain, Keadby LWS	✓	✓	✓	25m south-east of the Canal Water Abstraction on the Stainforth and Keadby Canal. 0.6km south-east of Main Site.
Keadby Wetland LWS	✓	✓	✓	25m south-east of the Canal Water Abstraction on the Stainforth and Keadby Canal. 0.7km south-east of Main Site.
Keadby Wet Grassland LWS	✓	✓	✓	50m south-east of the Canal Water Abstraction on the Stainforth and Keadby Canal. 0.7km south-east of Main Site.
Three Rivers LWS	x	✓	x	90m south (upstream) of the Waterborne

Designation	Potential impacts during			Relevance to the Proposed Development
	Construction	Operation	Decommissioning	
				Transport Off-loading Area on the River Trent. 1km south of Main Site.
South Engine Drain LWS	✓	x	✓	0.1km south of the Site entrance.

Protected and Notable Habitats

11.5.7. 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.

11.5.8. The semi-natural habitats within the Site are summarised below in **Table 11.8** and mapped on Figures 11C.3 of **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**), 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 further described, and their nature conservation value further qualified, in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**). Further detail on relevant aquatic habitats is also presented within **ES Volume II Appendix 11F:** Aquatic Ecology Survey Report (**Application Document Ref. 6.3**).

11.5.9. All habitats of local or higher value within the Site, as identified in **Table 11.8**, 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 existing water discharge connection from Keadby 1 Power Station, are not assessed further as they would not be affected by, and are therefore not relevant to the assessment of construction, operation and decommissioning of the Proposed Development.

11.5.10. The potential for veteran and ancient trees, and irreplaceable habitats of national nature conservation value, to be affected was determined through a specialist arboricultural survey and a subsequent on-site consultation with Tree Officers from North Lincolnshire Council, as summarised in the Tree

Survey Report (which is appended to the Outline LBMEP Report (**Application Document Ref. 5.11**)) and **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**). No veteran or ancient trees will be affected by the Proposed Development.

11.5.11. Other habitats within the 1km study area for this EcIA (as identified in **Table 11.8**) have also been considered where they are of sufficiently high biodiversity and nature conservation value (as defined in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**) and therefore where assessment of potential indirect impacts and effects is appropriate, after first considering typical good practice requirements for impact avoidance mitigation of potential air and water quality impacts as defined in **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**) and **Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**) respectively. Accordingly, the OMH and acid grassland habitat of national nature conservation value within the former Keadby Ash Tip (see **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)) adjacent to the Site is taken forward for impact assessment.

Table 11.8: Summary of the undesignated semi-natural habitats present within and adjacent to the Site

Habitat	Value	Relevant to the EcIA?
Within the Site		
Veteran and ancient trees	National	No - screened out, no impact.
Bioswale	Negligible	No - screened out, no impact.
Cropland	Negligible	No - screened out based on value
Ephemeral/ short perennial vegetation, including OMH	Negligible or National (if OMH)	Yes – an ancillary parcel of habitat integral to the OMH of the former Keadby Ash Tip overlaps with the land required for construction and temporary laydown. Without its connection to the wider OMH this uniform habitat parcel would not merit recognition as OMH.

Habitat	Value	Relevant to the EcIA?
Hedgerows and free-standing trees	Local (hedgerows) Negligible (free standing trees)	No - screened out, no impact.
Modified grassland	Negligible	No - screened out based on value
Neutral semi-improved grassland	Negligible	No - screened out, no impact
Plantation and semi-natural broad-leaved woodland	Local	Yes – within land required for construction of the Proposed Development
Mixed plantation woodland	Local	No - screened out, no impact
Scrub (dense and scattered)	Local	Yes - within land required for construction and temporary laydown
Watercourse: drains and canal	Up to county	Yes - within land required for construction of the Canal Water Abstraction, the replacement for Mabey bridge, Main Site and the Emergency Vehicle Access Road
Adjacent to the Site (relevant habitats only, see main text)		
Acid grassland	National	Yes – relevant to operational air quality assessment

Habitat	Value	Relevant to the EcIA?
OMH	National	Yes – relevant to operational air quality assessment

Protected and Notable Species

11.5.12. Protected and notable species potentially relevant to this EcIA are summarised below in **Table 11.9**, with further information provided in **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**). The identification of relevant species is further described, and their nature conservation value further qualified, in **ES Volume II Appendices 11C** to **11G** (**Application Document Ref. 6.3**).

11.5.13. Generally, only confirmed species of local or higher value (as identified in **Table 11.9**) are taken forward for impact assessment, although some consideration is also given to species that may establish in the future, as well as plant and animal INNS. 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 11.9: Summary of species relevant to the ecological impact assessment

Species	Value	Location of baseline information (ES Report Volume II – Application Document Ref. 6.3)	Potential Relevance to the EcIA
Badger	-	Confidential **Appendix 11D**	Relevant consultees should refer to the confidential appendix for information on badger.
Bats (foraging)	Local	**Appendix 11C**, Annexes 4 and 5	Construction and operation of Main Site. May be relevant at decommissioning stage also, depending on methods and future baseline.

Species	Value	Location of baseline information (ES Report Volume II – Application Document Ref. 6.3)	Potential Relevance to the EcIA
Breeding birds	Local	**Appendix 11G**	Construction, particularly of Main Site. May be relevant at decommissioning stage also, depending on methods and future baseline.
Fish	Lamprey – international European eel – regional All other species - local	**Appendix 11F**	Construction and operation of Proposed Water Abstraction and Discharge. May be relevant at decommissioning stage also, depending on methods and future baseline.
Flora (notable species)	Regional	**Appendix 11C**	Operation of Main Site. Dependent on habitats potentially sensitive to ammonia and nitrogen deposition during operation.
Invertebrates: aquatic	Up to county	**Appendix 11F**	Construction of Main Site, construction and operation of Proposed Water Abstraction and Discharge. May be relevant at decommissioning stage also, depending on methods and future baseline.
Invertebrates: terrestrial	National	**Appendix 11C**	Dependent on habitats and habitat conditions potentially sensitive to ammonia and nitrogen deposition during operation.

Species	Value	Location of baseline information (ES Report Volume II – Application Document Ref. 6.3)	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	Up to District	**Appendix 11E**	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.

11.5.14. For purposes of clarity, the following potential protected and notable species constraints are not relevant to the EcIA and are therefore not considered further:

- Great crested newt – no likelihood of presence (see **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**));
- Otter – no evidence found (see **ES Volume II Appendix 11E:** Riparian Mammal Survey Report (**Application Document Ref. 6.3**)), precautionary mitigation still appropriate;
- Roosting bats – no roosts present in the zone of influence (see **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal **(Application Document Ref. 6.3)**);
- Schedule 1 bird species – no suitable nesting and/ or roosting habitat in the zone of influence (see **ES Volume II Appendices 11C:** Preliminary

Ecological Appraisal and **11G:** Breeding Bird Survey Report (**Application Document Ref. 6.3**)); and

- White-clawed crayfish – no relevant habitat impacts, not present in this part of Lincolnshire (see **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)).

Future Baseline

Construction

11.5.15. In the absence of the Proposed Development, it is predicted that the habitat context and management of the Site and adjacent land would remain as the current baseline.

11.5.16. As no substantive changes in habitat context and condition are predicted, the species value of the Site and adjacent land would also remain consistent with the current baseline. Minor changes (upwards or downwards) in the distribution and abundance 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, 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

11.5.17. The future ecological baseline at the start of operation would not differ substantively from that described above for construction, but change is possible over the anticipated operational life of the Proposed Development.

11.5.18. 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 commencement of operations. 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.

11.5.19. There are a variety of nature conservation designations in the vicinity of the Site. It is not possible to state with certainty how the nature conservation value of these designations might change over the medium to long term

operational period, and this would ultimately depend on long-term management regimes. Factors likely to influence (positively or negatively) the integrity and nature conservation value of designations will depend on the suitability of land management regimes, development pressures, and over the longer term climate change and anticipated improvements in air quality as pollutants decrease due to changes in technology and the types of emissions sources[3]. For national designations, there will remain a legal obligation to maintain or achieve (where this is failing) favourable condition, so the condition of these designations needs to be assumed to be stable or improving over time.

11.5.20. The assemblage of fish in the River Trent and the Stainforth and Keadby Canal is anticipated to gradually improve over time due to the removal of weirs and other barriers upstream in the wider catchment. Other general medium-term improvements in the biological quality of the River Trent and the Stainforth and Keadby Canal may occur over time due to WFD requirements (see **ES Volume I Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**)).

11.5.21. Therefore, the watercourses associated with the Proposed Cooling Water Abstraction and Discharge are likely to have an increased functional importance for fish, including 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.

Decommissioning

11.5.22. The future baseline conditions in the vicinity of the Proposed Development are 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 watercourses and other habitats created at a time contemporaneous with construction or operation, can reasonably be anticipated.

11.5.23. The above acknowledged, much of the land relevant to decommissioning activities will be within the built footprint of the Site. Therefore, the baseline conditions relevant to decommissioning will be less ecologically sensitive

[3] The UK Clean Air Strategy (DESNZ *et al*., 2019) details commitments to monitor impacts of air pollution on habitats and reduce the levels of damaging deposition of reactive forms of nitrogen by 17% over England's protected priority habitats by 2030.

than 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.

11.6. Development Design and Impact Avoidance

11.6.1. 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' (see **ES Volume II Appendix 11B:** EcIA Methods (**Application Document Ref. 6.3**) 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, operational or decommissioning environmental best practice, or as a result of legislative requirements.

11.6.2. 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 groundwater pollution, fugitive dust management, noise prevention or amelioration) can be assumed in accordance with NPS EN-1 paragraph 4.12.10. It must be assumed that all measures available to regulators to secure such requirements will be properly applied and enforced by the relevant regulators. Most of the measures required are already committed and are captured in the **Outline CEMP** (**Application Document Ref. 7.4**).

11.6.3. 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 likely to be required, suitable measures to comply with relevant protected species legislation are summarised below and include attainment of all necessary licences and permits. These requirements are captured in the **Outline CEMP** (**Application Document Ref. 7.4**).

11.6.4. 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 described below.

Construction

11.6.5. 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 instead comprises land of relatively low ecological sensitivity. The latter includes previously developed land and land under intensive agricultural management (refer to Section 6.6 of **ES**

Volume II Chapter 6: Consideration of Alternatives (**Application Document Ref. 6.2**)).

11.6.6. The Additional Abnormal Indivisible Load (AIL) route and temporary laydown area established for the construction of Keadby 2 Power Station will be re-used for the Proposed Development. This will require an extension to the duration of temporary use of these areas, with a consequent comparable delay in delivering the existing approved habitat restoration for the AIL route. 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.

11.6.7. The Applicant is proposing to re-use existing assets and pipework for Keadby 1 Power Station for the discharge of treated effluent to the River Trent. Interconnecting pipework would extend from the Main Site to connect to this infrastructure. Should any maintenance activities be required to the existing discharge pipework and outfall infrastructure, this would be undertaken as part of the wider operation and maintenance activities for the Keadby Power Stations.

11.6.8. All watercourses will be protected and subject to appropriate stand-offs (including those associated with proposed temporary construction laydown areas) except where construction works have been identified as necessary within **ES Volume I Chapter 4:** The Proposed Development or **Chapter 5:** Construction Programme and Management (**Application Document Ref. 6.2**), and as assessed within this chapter. Any impact on such watercourses will be minimised and appropriate mitigation will be adopted, as set out in **ES Volume I Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**).

11.6.9. The installation and subsequent removal of the single small temporary cofferdam required to enable construction of the Proposed Canal Water Intake (including eel screens) will be completed in accordance with the requirements of the relevant regulators. With the exception of European eel and possibly (on the advice of Natural England) lamprey, the canal is not likely to be important for migratory fish movements given the presence of lock gates and because the habitat conditions and flow regime are not optimal for migratory fish species. Comparable construction works have relatively recently been consented and completed within the Stainforth and Keadby Canal for the Keadby 2 Power Station cooling water intake, and comparable works have also been previously approved for the Keadby CCS Power Station. No concerns in relation to European eel and lamprey were identified in relation to these two prior comparable schemes. Standard fish protection

measures are captured in the **Outline CEMP** (**Application Document Ref. 7.4**) to provide further confidence that fish will not be adversely affected.

11.6.10. Consistent with the approved approach for Keadby CCS Power Station, an Ecological Clerk of Works (ECoW) would be employed, and this is captured in the **Outline CEMP (Application Document 7.4**), to supervise and manage the implementation of measures to mitigate impacts on ecological features, including protected species, prior to and during the construction phase. This would encompass both licensed and relevant unlicensed activities.

11.6.11. Construction temporary lighting will be designed so that excessive glare is minimised outside of the construction site as far as reasonably practicable. Measures to minimise light disturbance to ecological receptors is detailed in the **Outline Lighting Strategy** that accompanies the Application (**Application Document Ref. 5.11**).

11.6.12. All habitats disturbed during construction, such as land within the temporary construction laydown areas, electricity connection route and proposed abstraction/ discharge corridor, would be reinstated where reasonably practicable on a like-for-like basis at the same location following construction. In some case the reinstated habitat will be enhanced for biodiversity as set out in the **Outline LBEMP Report** (**Application Document Ref. 5.10**)

11.6.13. Updated ecological surveys would be completed prior to the start of construction, where necessary, to gain up to date information on relevant protected or notable species whose status or distribution may have changed since baseline surveys were completed (e.g. badger). This would be required to inform protected species licence applications (where necessary), or otherwise to determine appropriate mitigation requirements. Based on current data a water vole licence may be required prior to infilling of sections of drain within the Main Site. However, the status of water vole could change (decrease or increase) prior to construction so the need for a licence would need to be confirmed prior to construction. No other licences are likely to be required.

11.6.14. 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

11.6.15. A Water Vole Impact Avoidance 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. This pre-commencement commitment forms part of the **Outline CEMP** (**Application Document Ref. 7.4)**.

11.6.16. The Water Vole Impact Avoidance Strategy will include details of:

- the results of further surveys completed to inform the Strategy, ongoing requirements for survey and monitoring, and attendance by an appropriately experienced ECoW;
- requirements for licences to permit the relevant construction works to proceed;
- 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 meet the terms of any necessary licences;
- requirements for habitat provision to accommodate any water voles displaced because of the Proposed Development. The current baseline data indicates that existing habitats could absorb displaced water voles as this species is only present in small numbers and patchily distributed. Habitat enhancement is also committed to improve wider habitat suitability;
- requirements (if further pre-construction surveys deem this to be relevant) for trapping, exclusion and relocation of water voles from relevant construction areas (based on current levels of water vole activity, adjacent retained areas of drains are anticipated to be sufficient to accommodate any water voles displaced – refer to Section 11.7 impact assessment); and
- site inductions and toolbox talks as appropriate.

Breeding Birds

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

- clearance of suitable vegetation will be programmed as far as reasonably practicable for completion outside the breeding season (typically March-August inclusive for most species);
- site inductions and toolbox talks as appropriate; and
- in situations where the above breeding bird mitigation is not practicable, 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

11.6.18. 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 for the Proposed Canal Water Intake on the Stainforth and Keadby Canal. Prior submission and approval of the Fish Management Plan is a commitment and is captured within **the Outline CEMP** (**Application Document Ref. 7.4**).

11.6.19. The Fish Management Plan will include details of:

- appropriate timings;
- provision for screening of pump intakes to prevent fish being drawn into the pipe/pump;
- supervision of dewatering of any cofferdam 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 canal outside the working area;
- 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; and
- biosecurity measures to address the INNS known to be present within the canal.

General Animal Welfare During Construction

11.6.20. Vegetation clearance and construction excavations have potential to affect wildlife and may result in offences under animal welfare legislation if not appropriately managed. An ECoW would be employed to supervise all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance.

11.6.21. Excavations would be covered or fenced overnight, or where this is not practicable, a means of escape would be fitted e.g. battered soil slope or scaffold plank, to allow any animals (e.g. reptiles, badger, otter, brown hare, hedgehog) that may stray into the construction site to vacate excavations, should they fall in.

11.6.22. Ditches will only be infilled after a process of carefully undertaken vegetation removal (i.e. cutting of vegetation to a minimum height of 250mm and removal of arisings to allow inspection, followed by a second cut to ground level and removal of arisings) supervised by the ECoW, so that wildlife such as small mammals, reptiles and amphibians can be identified and displaced

or relocated prior to infilling taking place. This is in addition to any other specific measures required for species such as water vole and birds.

11.6.23. The above measures will be secured through the **Outline CEMP** (**Application Document Ref. 7.4)**.

Invasive Species Management Plan (ISMP)

11.6.24. A plant INNS survey will be undertaken prior to construction to determine the current location and extent of plant INNS. An ISMP will be prepared to accompany the final CEMP and would be agreed with relevant stakeholders. Prior submission and approval of the ISMP is a commitment of the **Outline CEMP** (**Application Document Ref 7.4)**.

11.6.25. The ISMP will specify the control/ eradication (as reasonable and practicable), biosecurity measures (such as check, clean, dry or other suitable treatments) and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations.

11.6.26. Biosecurity requirements will address all potential pathways for interaction with and dispersal of INNS, including movements of vehicles, machinery and staff:

- into the Proposed Development Site from third party locations, e.g. during construction mobilisation;
- between different parts of the Site, most especially between different watercourses; and
- from the Site for redeployment elsewhere.

Operation

11.6.27. The water intake structure on the Keadby and Stainforth Canal will be equipped to comply with the Eels (England and Wales) Regulations 2009 and it is expected to comprise 2mm multidisc eel screens(1.2bar) to minimise the risk to fish as they are returned to the canal. The system is similar to that approved by the Environment Agency and that has been constructed for Keadby 2 Power Station (refer to **ES Volume I Chapter 4:** The Proposed Development (**Application Document Ref. 6.2**)). The proposed screen mesh size, in combination with the fish return, is suitable to protect all life stages of eel and therefore is also suitable to protect all other fish species utilising the Stainforth and Keadby Canal. The final design will be based on a Best Available Techniques (BAT) assessment in accordance with the Joint Environment Protocols.

11.6.28. Treated effluent will be discharged to the River Trent at a rate and with a chemical water quality compliant with the discharge limits set by the

Environment Agency within the Environmental Permit, considering BAT for those discharges.

11.6.29. Lighting impacts on sensitive ecological features (e.g. the former Keadby Ash Tip) would be minimised as far as reasonably practicable for example by directing lighting away from adjacent habitats in accordance with the **Outline Lighting Strategy** that accompanies the Application (**Application Document Ref. 5.11**).

11.6.30. Ground-level air quality impacts on relevant biodiversity and nature conservation features will be minimised through the use of appropriate stack height(s) to optimise dispersion of pollutants, and emissions monitoring to demonstrate continued compliance with emission limit values (ELV) set by the Environment Agency. **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**) describes the results of atmospheric dispersion modelling which have informed the stack heights set out in **ES Volume I Chapter 4:** The Proposed Development (**Application Document Ref. 6.2**).

Decommissioning

11.6.31. 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** (**Application Document Ref. 3.1**). Update habitat, protected species and INNS surveys would be completed at that time to re-confirm the relevant biodiversity and nature conservation features and inform specification of the DEMP.

11.6.32. 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.

11.7. Likely Impacts and Effects

11.7.1. 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 11.6).

11.7.2. This assessment takes account of policy given in NPS EN-1 (paragraphs 4.12.9 to 4.12.10). This states:

> "*in considering an application for development consent … focus on whether the development itself is an acceptable use of the land, and the impacts of that use, rather than the control of processes, emissions or discharges themselves.*" (paragraph 4.12.9)
>
> *"The Secretary of State should 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.*" (paragraph 4.12.10)

11.7.3. In accordance with this policy, 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 **ES Volume I Chapter 8:** Air Quality, **Chapter 9:** Noise and Vibration and **Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**).

11.7.4. In making this assessment, regard has been given to other relevant ES chapters, specifically **ES Volume I Chapter 8:** Air Quality, **Chapter 9:** Noise and Vibration and **Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**). It is not considered necessary in this chapter to replicate the detailed impact assessments provided in these 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 represents a formal commitment and is captured in the Commitments Schedule that accompanies the Application (**ES Volume II Appendix 22A** (**Application Document 6.3**)). Implementation of this mitigation can therefore be assumed, and it will be delivered as outlined in the relevant chapter and/ or as specified in the **Outline CEMP** (**Application Document Ref. 7.4**).

11.7.5. 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 11.5 of this chapter.

Construction

Humber Estuary SSSI, SAC and Ramsar Site

11.7.6. The potential impact pathways relate to:

- construction air quality impacts, specifically potential air quality impacts (dust deposition, NOx and nitrogen deposition) on habitats for which the Humber Estuary is designated; and
- construction noise and visual disturbance of breeding, passage and wintering birds for which the Humber Estuary SSSI and Ramsar site is designated.

11.7.7. 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 AILs 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. No upgrades to the wharf or equipment would be required for the Proposed Development and no works are proposed within the Humber Estuary SSSI, SAC and Ramsar site (an oversail for mobile cranes has been included in the Site boundary only).

11.7.8. Potential construction air quality impacts are identified in **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**) in relation to dust. NO_x and nutrient nitrogen deposition. The qualifying habitat features within the zone of influence for assessment are:

- estuaries – a composite habitat encompassing the main river channel and the habitats listed below;
- mudflats and sandflats not covered by seawater at low tide – encompassing the marginal mud banks exposed at low tide;
- upper saltmarsh; and
- common reed vegetation fringing the River Trent.

11.7.9. Whilst a potential dust impact on vegetation is identified **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**) this can be discounted as there is no likely pathway for an impact on the above habitats. The closest construction activities for the Proposed Development are for the Canal Water Abstraction which is located over 600m from the Humber Estuary SAC and Ramsar site. This is well beyond the 50m zone of influence used for purposes of assessment of potential impacts and effects from construction dust. As such, there is a high degree of confidence that dust

would not be elevated above the typical background levels and reach the Humber Estuary as the construction activities are too distant for this to occur.

11.7.10. Further, this pathway could only apply if dust was mobilised into the wider environment, which is not likely given public health requirements for the control of dust. Dust suppression and monitoring to protect public health is secured within the **Outline CEMP** (**Application Document Ref. 7.4**) for example wheel washes and dust suppression would be applied before construction vehicles exit construction areas to protect public health from dust

~~11.7.8. However, this can be scoped out following review of the habitats in the potential zone of influence of construction air quality impacts i.e. estuaries (encompassing the main river channel) and mudflats and sandflats not covered by seawater at low tide (encompassing the marginal mud banks exposed at low tide). The relevant habitats are therefore those that are either permanently submerged, or periodically exposed and re-submerged as part of the normal tidal cycle.~~

~~11.7.9. Any dust deposited in these circumstances would add trivially to the existing high sediment load already carried by the estuary. There is no mudflat vegetation present in the study area that could experience dust deposition at low tide and, even if there was, this would be removed at the next tide through water movement and wave action. Regardless, embedded good practice mitigation is committed in **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**) to limit potential for fugitive dust to occur and by so doing protect human receptors adjacent to the Humber Estuary.~~

~~11.7.10.~~11.7.11. The critical levels/loads for NO_x, ~~and~~ nutrient nitrogen deposition and acid deposition would not be exceeded at any of the 20 locations modelled for the Humber Estuary SAC and Ramsar site.

~~11.7.11.~~11.7.12. The above 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. There would be no losses of bird habitats (mudflat) as no works are proposed within the River Trent.

~~11.7.12.~~11.7.13. Construction works might also affect birds through disturbance and displacement when using adjacent habitats within the above designations e.g. adjacent mudflats at low tide or, in the case of golden plover (*Pluvialis apricaria*) and lapwing (*Vanellus vanellus*), functionally linked habitats that could include open grassland and arable fields.

~~11.7.13.~~11.7.14. No adverse increase in absolute noise levels is predicted at habitats within the relevant designations within **ES Volume I Chapter 9:** Noise and Vibration (**Application Document Ref. 6.2**). The worst-case

modelled airborne noise level as a result of construction activities for the Main Site (i.e. the main civil engineering works) at NSR 4 (Mariners Arms Flats), a relatively quiet location adjacent to the banks of the River Trent, is 47dB which is predicted to occur during weekday daytime construction hours. The comparable value for NSR 3 (Keadby Village) is 49dB. Canal water abstraction construction noise is predicted to be 48dB at NSR3 and NSR4 during weekday daytime construction hours. These absolute noise levels are less than the baseline sound levels at NSR 3 and 4 which is 53 and 55dB respectively. Therefore construction noise at the Main Site would not be discernible at the River Trent from the existing baseline.

~~11.7.14.~~11.7.15. A limited suite of qualifying bird species (golden plover and lapwing) may also utilise terrestrial habitats for foraging and these could be affected by loss of open grassland and/or arable habitats to the Proposed Development. The potentially suitable areas of grassland in the zone of influence are located within the Main Site, a location that is encroached by existing development and is adjacent to existing operational areas (Keadby 1 and 2 and the National Grid substation). As such, there is no reasonable likelihood that the Main Site, which is enclosed by trees and industry, would have specific importance as foraging habitat for golden plover and lapwing.

~~11.7.15.~~11.7.16. In relation to the potential for arable fields to be utilised by golden plover and lapwing, it is notable that the BTO Data Report obtained as part of the desk study (and appended to the **HRA Appropriate Assessment Report** (**Application Document Ref. 5.2**)) identifies no notable aggregations of these species within the 10km grid square containing the Site.

~~11.7.16.~~11.7.17. This is further supported by data gathered through twice monthly wintering (i.e. the season when golden plover and lapwing numbers are at their peak on farmland) bird surveys completed between October 2021 and March 2022 inclusive for two proposed solar farms that would be located on agricultural land immediately west (‘Ealand Solar’) and north (‘Keadby’ Solar’) of the Main Site and the former Keadby Ash Tip. Both sites coincide with the existing Keadby Wind Farm. These surveys were timed with reference to the tidal state with an emphasis on high tide observation to establish if the sites were used for winter high tide roosting or foraging. The wintering bird survey reports (FPCR Environment and Design Ltd (FPCR), 2022a,b) for these proposed solar farms was submitted with requests for a Scoping Opinion from North Lincolnshire Council (application references PA/SCR/2021/7 and PA/SCR/2021/8) and are in the public domain.

~~11.7.17.~~11.7.18. The FPCR surveys found no evidence that the agricultural land within the proposed wind farms has functional importance for qualifying bird species of the Humber Estuary SPA and Ramsar site. The presence of such species was at most transitory and the numbers present were low,

evidencing incidental usage only (refer to the **HRA Appropriate Assessment Report** for more detail (**Application Document Ref. 5.2**)).

~~11.7.18.~~11.7.19. In terms of absolute noise levels reaching arable fields, noise modelling (**ES Volume I Chapter 9:** Noise and Vibration (**Application Document Ref. 6.2**)) indicates that the worst-case noise levels within 300m of (equating to one field out from) the construction activities for the Main Site would be 56dB over the arable fields to the north of the Main Site and 59dB over the arable fields to the south of the Main Site. However, it is emphasised that the baseline is not undisturbed agricultural setting as it coincides with the area occupied by the Keadby Wind Farm i.e. arable fields already subject to elevated levels of background noise (relative to undeveloped areas of farmland) arising from the presence and movement of the wind turbines.

~~11.7.19.~~11.7.20. The construction noise level for the land to the north is consistent with the baseline sound levels received at NSR 8 (North Pilfrey Farm) and NSR 9 (Ealand Poultry Farm) which is 52-56db and 54-56db respectively and provides some context for the landscape associated with the existing Keadby Wind Farm. Within two fields out from the Main Site, the predicted noise level declines to 54dB to the north of the Main Site and 56dB to the south of the Main Site which is again consistent with the baseline sound levels received at NSR 8 and 9.

~~11.7.20.~~11.7.21. Postlethwaite and Stephenson (2012) reported evidence from a detailed measurement exercise on the disturbance effects on birds at Pyewipe mudflats (located within the Humber Estuary SPA) from percussive piling for the Grimsby River Terminal. This study found that noise levels from piling of less than 66dB gave rise to no noise disturbance on birds using the mudflats, whilst noise levels in the range of 66 to 83dB resulted in low level disturbance only (heads raised alert and temporarily stopping feeding, or roosting). Similarly, Cutts *et al.* (2009) concluded that regular construction noise at or below 50dB is not likely to result in an impact on birds.

~~11.7.21.~~11.7.22. Therefore, if the lower threshold is applied based on Cutts *et al.* (2009) then this indicates that the worst-case impact from the Proposed Development could result in some minor changes in behaviour by birds within the zone of influence. It is emphasised that these worst case noise levels would not be continuous as the largest contributor to noise is the periodic piling operations and this is not a continuous activity and would largely be restricted to daytime construction hours. In this context low level disturbance might arise during piling, but bird behaviour would quickly return to normal between discrete phases of piling.

~~11.7.22.~~11.7.23. Further, the baseline sound data indicates that birds are already likely to be experiencing comparable sound levels, at least within the zone of influence of the existing Keadby Wind Farm. In which case, birds are either

already excluded by the existing sound levels or some level of habituation would seem likely. In either case, this would suggest little potential an adverse effect from the Proposed Development.

~~11.7.23.~~11.7.24. Therefore, the potential disturbance zone of influence associated with arable farmland (noting that periodic piling operations at the Main Site are likely to give rise to the most disturbance and that this is not a continuous activity), is considered negligible to small-scale given that (a) available bird data demonstrates only incidental usage of arable fields by qualifying bird species, and (b) the extensive availability of comparable arable habitats in the wider North Lincolnshire landscape. Further, noise would be restricted to areas that are already subject to comparable existing background noise from the Keadby Wind Farm.

~~11.7.24.~~11.7.25. Accordingly, it is considered that any construction disturbance, should this occur, would not adversely affect the nature conservation status of these bird species and assemblages relevant to the designations.

~~11.7.25.~~11.7.26. After taking account of all relevant potential impact pathways, the potential construction effect on the Humber Estuary SSSI, SAC and Ramsar site is assessed as **negligible (not significant)**.

Other European Sites and National Nature Conservation Designations

~~11.7.26.~~11.7.27. Based on consideration of possible impact pathways and the findings of **ES Volume I Chapter 8:** Air Quality, **Chapter 9:** Noise and Vibration and **Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**), there are no likely significant direct or indirect construction impacts and effects on any other statutory nature conservation designations set out in Table 11.6.

Non-Statutory Nature Conservation Designations - Stainforth and Keadby Canal Corridor LWS

~~11.7.27.~~11.7.28. The 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 Site are described in **ES**

Volume II, Appendices 11C: Preliminary Ecological Appraisal and **11F:** Aquatic Ecology Survey Report (**Application Document Ref. 6.3**).

~~11.7.28.~~11.7.29. The LWS will be directly affected by the construction of the Proposed Canal Water Intake on the Stainforth and Keadby Canal. It is proposed that a new water intake structure would be constructed directly adjacent to the intake constructed to supply Keadby 2 Power Station. At this location the boundary of the LWS is restricted to the immediate margins of the canal, and the banks are vertical and reinforced. Therefore, construction impacts will be limited to small-scale temporary loss and disturbance of existing open water habitats of low floristic diversity and structural complexity within an area extending up to 10m into the channel, and associated dewatering. There is no marginal aquatic vegetation present and there are no other bankside habitats within the boundary of the LWS that would be affected by the required construction works.

~~11.7.29.~~11.7.30. The potential worst-case impact on the nature conservation status and integrity of the Stainforth and Keadby Canal LWS would be adverse at no greater than the local (site) level, given the habitat conditions present and existing limitations on vegetation establishment, and the large size of the LWS. Therefore, the potential construction effect on the LWS is assessed as negligible **(not significant)**.

~~11.7.30.~~11.7.31. The **Outline LBMEP Report** that accompanies the Application (**Application Document 5.10**) identifies options to improve the canal and areas that abut the LWS at North Pilfrey Bridge and by so doing enhance the habitat corridor within which the LWS is located. This is also necessary to achieve BNG.

Non-Statutory Nature Conservation Designations - Hatfield Waste Drain LWS

~~11.7.31.~~11.7.32. Replacement of the existing open span Mabey Bridge over the LWS at the Site entrance off the A18 will require disturbance to the banks of the LWS within the footprint of and immediately adjacent to the existing bridge. Installation of a new open span steel decked bridge will require localised ground excavation to construct foundations for the replacement bridge, but these works will not affect the banks of the drain as the new foundations would be located behind the existing foundations (i.e. located further away from the LWS). They are also largely restricted to the footprint of the existing bridge and access road.

~~11.7.32.~~11.7.33. The area of bank vegetation (species-poor grassland and stands of common reed) affected would be very small in the context of the LWS, which is 10.3km long and therefore has over 20km of associated bank habitat. The

existing bank vegetation is already affected to a large extent by the existing bridge structure, which spans above and casts shade over the drain bank at the location where the replacement bridge will be constructed.

~~11.7.33.~~11.7.34. Any areas of bank temporarily disturbed during these works would be re-sown as far as reasonably practical and if deemed necessary with a suitable grassland seed mixture to stabilise the banks after which other flora will colonise from immediately adjacent areas. Further details of this approach is set out in the **Outline LBMEP Report** that accompanies the Application (**Application Document Ref. 5.10**).

~~11.7.34.~~11.7.35. Once the replacement bridge is in place and habitat reinstatement has been completed, then the LWS would be expected to return to a condition consistent with the existing baseline conditions within circa 1 year.

~~11.7.35.~~11.7.36. Therefore, 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 negligible (**not significant**).

~~11.7.36.~~11.7.37. Some of the proposed new native grassland habitats to be provided as part of the **Outline LBMEP Report** (**Application Document Ref. 5.10**) will be located to abut the LWS on the northeast side of Mabey Bridge. It will therefore enhance the habitat corridor within which the LWS is located.

Other Local Nature Conservation Designations

~~11.7.37.~~11.7.38. Based on consideration of possible impact pathways and the findings of **ES Volume I, Chapter 8:** Air Quality**, Chapter 9**: Noise and Vibration and **Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**), there are no likely significant direct or indirect construction impacts and effects on any other local nature conservation designations.

Habitats - Ephemeral/ Short Perennial Vegetation and Open Mosaic Habitat

~~11.7.38.~~11.7.39. As described in **ES Volume I Chapter 6**: Consideration of Alternatives (**Application Document Ref. 6.2**) the layout of the Proposed Development and choice of temporary construction laydown areas has been configured to avoid as far as practicable an impact on high quality ephemeral/ short perennial habitats. However, a small-scale loss cannot be avoided for the Ancillary Facilities for the Main Site where there is a minor overlap with the margin of the former Keadby Ash Tip.

~~11.7.39.~~11.7.40. At this location, 0.27ha of ephemeral/ short perennial vegetation would be lost that is connected to, and therefore contributes to, a large area

of high quality (national nature conservation value) OMH. This habitat loss represents 1.7% of the OMH within the former Keadby Ash Tip, with the remaining area retained unaffected.

~~11.7.40.~~11.7.41. The area of vegetation that will be lost is peripheral to the main area of OMH and has a relatively level compacted stone substrate due to it coinciding with an area used in the past as a vehicle access route. Therefore, while it is part of the OMH by virtue of its connection to the wider habitat resource, it lacks the characteristics of the wider habitat resource that result in its high value (i.e. varied topography, variable substrates, more complex vegetation structure). Without the context of its connectivity to the wider area of OMH, this discrete area would not be considered to be of national value as it does not have characteristics likely to sustain most of the flora and terrestrial invertebrates for which the wider habitat is of biodiversity value. It also, when considered in isolation, would not be expected to meet the full definition of OMH as the conditions are quite uniform and the substrate compacted (see **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)).

~~11.7.41.~~11.7.42. Following construction, it is anticipated that some of the area which has been disturbed will be suitable for the re-establishment of ephemeral/ short perennial vegetation, as there are peripheral areas that will not be hard landscaped. As the area of habitat that could re-establish cannot be quantified until detailed design, this area is not relied on for purposes of impact assessment. In other words, a permanent loss has been assumed.

~~11.7.42.~~11.7.43. The loss of habitat contributing to the wider OMH will not compromise the structure and function or conservation status of the wider OMH. This is because the affected area is small, peripheral and of sub-optimal condition. Therefore, the effect is assessed as meaningful at the local level only and therefore is minor adverse (**not significant**). The balance of permanent habitat losses and gains associated with the Proposed Development is considered further within the BNG assessment that accompanies the Application.

~~11.7.43.~~11.7.44. The above conclusion of the impact assessment and the proposed mitigation was agreed previously with NLC in relation to the Keadby CCS Power Station DCO, and the mitigation approach is unchanged from that previously agreed as acceptable.

Habitats – Woodland

~~11.7.44.~~11.7.45. Construction of the Proposed Development is expected (pending detailed design) to require the removal of 0.1ha of poor quality plantation woodland on Chapel Lane (habitat parcel 19) as the proximity of built infrastructure indicates that they cannot be retained. This plantation has previously been affected by construction of Keadby 2 Power Station, the

trees are semi-mature, and there is no ground flora. This and the small size of this woodland means that it is of no more than local biodiversity value, and the loss of this woodland would affect the nature conservation status of the wider woodland habitat resource at the Site level only. It is proposed that the space formerly occupied by this plantation woodland be planted with native scrub after construction, to reinstate woody vegetation and a comparable biodiversity value. The effect is therefore minor adverse (**not significant**).

~~11.7.45.~~11.7.46. Construction of the Canal Water Abstraction could (pending detailed design) require the worst-case removal of 0.18ha of secondary broad-leaved woodland (habitat parcel 86) of local value. Whilst the permanent water intake structure would be comparable in size to the existing structure for Keadby 2 Power Station and in the order of 0.04ha, currently it is assumed that a wider area of woodland would be lost to create space for access and construction. Woodland would be replanted around the Canal Water Abstraction if possible, subject to the final detailed design.

~~11.7.46.~~11.7.47. The affected stand of woodland includes a large clearing (approximately 40% of the total area) dominated by a stand of common nettle. Therefore, whilst this clearing is part of the woodland, the implication is that the loss of tree cover is much less than the total woodland area. Further, the affected stand of woodland represents no more than 15% of the total area of woodland, which extends further eastwards from the Site, at this location. The loss of this woodland would affect the nature conservation status of the wider woodland habitat resource at the Site level only, and once a mature canopy is re-established (which will take approximately 15 years from planting) the woodland would have a structure and function for wildlife that is comparable with the existing secondary woodland. The effect is therefore minor adverse (**not significant**).

Habitats - Scrub

~~11.7.47.~~11.7.48. There will be a permanent loss of 0.29ha of scrub of local (site) nature conservation value for construction of the Ancillary Facilities for the Main Site.

~~11.7.48.~~11.7.49. It is considered that such minor losses of 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.

~~11.7.49.~~11.7.50. Comparable dense scrub will be reinstated as part of the soft landscaping that will accompany the Proposed Development and is further supplemented by new plantings of structurally comparable native hedgerow. These plantings would not be in the same location as the dense scrub that will be lost, but the new habitat will form part of a cohesive landscape and biodiversity strategy (refer to the **Outline LBMEP Report** (**Application**

Document Ref. 5.10)) to enable a comparable biodiversity value to be re-established. No permanent losses of scrub habitat are therefore anticipated, with comparable scrub habitat likely to be re-established within 5 years of the completion of landscaping works.

~~11.7.50.~~11.7.51. Given the above considerations, the small-scale loss of scrub to the Proposed Development is assessed as negligible (**not significant**).

Habitats - Watercourses

~~11.7.51.~~11.7.52. Watercourses referred to in this section are shown on Figure 11F.1 in **ES Volume II Appendix 11F:** Aquatic Ecology Survey Report (**Application Document Ref. 6.3**).

~~11.7.52.~~11.7.53. Construction of the Main Site could result in the loss of two minor field drains and part of a third (Drains A, 4 and 2 respectively) of up to local biodiversity and nature conservation value. These drains hold no or only shallow permanent water and support a very limited diversity of aquatic and wetland plant species (up to six higher plant species per drain). However, they have a minor value in terms of the contribution made to the wider network of field drains in the local area, and they connect to and, during periods of high water levels, provides water to other drains of higher nature conservation value. This includes Keadby Boundary Drain LWS located to the immediate north-west of the Main Site.

~~11.7.53.~~11.7.54. Given the limited existing biodiversity and nature conservation value of the relevant drains, it is considered that the impact arising from habitat loss can be readily compensated through sensitive design of the surface water attenuation infrastructure required for the Proposed Development, and habitat enhancement works proposed to improve the quality of other similarly low value drains associated with the boundaries of the Main Site (refer to the construction impact assessment for water vole, in paragraph 11.6.54 below).

~~11.7.54.~~11.7.55. Construction also has the potential to affect Drain 1 (part of Glew Drain) located on the northern boundary of the Main Site which supports an assemblage of aquatic and wetland plants of county value (see **ES Volume II Appendix 11F:** Aquatic Ecology Survey Report (**Application Document Ref. 6.3**)). In order to comply with relevant internal drainage board (IDB) bylaws relating to the design of new bridges, a localised impact to the channel of the Glew Drain cannot be avoided during construction of a bridge crossing for the proposed Emergency Vehicle Access Road (refer to **ES Volume I Chapter 5**: Construction Programme and Management (**Application Document Ref. 6.2**)). The IDB bylaws require that the bed of the drain to be lined with concrete below the bridge to impede the growth of

rank vegetation under the bridge. This minor impact is offset by the habitat enhancement works proposed on other drains nearby.

~~11.7.55.~~11.7.56. In addition, there are two other short sections of drain (a second section of Glew Drain and a section of Keadby Common Drain adjacent to Chapel Lane) that are crossed by and could be indirectly affected during any upgrade works required to the existing track to provide an emergency access road from the northern boundary of the Main Site towards Chapel Lane (refer to **ES Volume III Figure 3.3:** Indicative Parts of Site Plan (**Application Document Ref. 6.4**). No other drains are likely to be affected by construction, as they coincide with existing infrastructure for the Keadby 1 and 2 Power Stations.

~~11.7.56.~~11.7.57. 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 10 - 15m stretches of drain bank and channel for installation over the bridge over Drain 1 (Glew Drain). The worst-case habitat loss on Glew Drain would therefore be 15m from a drain that is at least 1.7km long (0.9%). Therefore, assuming a worst-case, greater than 99% of the Glew Drain would remain suitable to support the aquatic invertebrate assemblage.

~~11.7.57.~~11.7.58. Mandatory requirements to comply with relevant legislation, along with the requirements of permitting and regulatory regimes, are sufficient to prevent potential adverse indirect 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.

~~11.7.58.~~11.7.59. The loss of the identified drains of local nature conservation value and additional localised and relatively small-scale permanent construction impacts on Drain 1 (Glew Drain) 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 assemblages. Therefore, the impact is of local scale only and restricted to the immediate footprint of the relevant construction works. As such, the combined effect is assessed as minor adverse (**not significant**). Habitat compensation will be required to achieve BNG and to meet requirements for water vole.

Bats

~~11.7.59.~~11.7.60. The only part of the Site 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 Annexes 5 and 6 of **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)), but not within the Main Site. This low activity relates to the habitats

present within the Main Site which 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).

~~11.7.60.~~11.7.61. 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 (Annex 5, **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)).

~~11.7.61.~~11.7.62. The loss of the identified field drains within the Main Site represents the only permanent loss of habitat of potential importance to foraging and commuting bats. The survey results reported in Annex 4 of **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**) identified negligible bat activity in association with these drains.

~~11.7.62.~~11.7.63. Construction temporary lighting is not considered a relevant potential impact on bats as the proposed core working hours during construction (07:00 to 19:00, see **ES Volume I Chapter 5**: Construction and Management (**Application Document Ref. 6.3**). This mean that lighting is not likely to be routinely used during hours of darkness when bats are active (some limited construction may occur outside core hours when construction activities cannot be stopped, such as concrete pouring), or would only be used at times of year when bats are less active or in hibernation (i.e. over the winter months). Regardless, the survey data indicates that the consequences of any construction 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 to minimise light disturbance, being directed to working areas so as not to illuminate foraging habitats adjacent to the Site of greater potential value to bats (e.g. the Stainforth and Keadby Canal habitat corridor). Requirements for construction lighting are set out in the **Outline Lighting Strategy** that accompanies the Application (**Application Document Ref. 5.11**).

~~11.7.63.~~11.7.64. Localised noise and vibration impacts during construction of the Main Site are unlikely to meaningfully disturb bats or affect habitat usage. This is because the committed construction working hours largely preclude potential for construction activities to coincide with periods of bat activity. The limited bat activity recorded further supports this, as there is no evidence that the Main Site or adjacent land is of specific importance for bats.

~~11.7.64.~~11.7.65. 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 negligible (**not significant**).

Water Vole

~~11.7.65.~~11.7.66. Water vole and its habitats have the potential to be a relevant construction constraint in the Main Site and in sections of Glew Drain affected by the Emergency Vehicle Access Road.

~~11.7.66.~~11.7.67. Baseline surveys in 2020 and 2023 recorded limited evidence of water vole within the Main Site (see **ES Volume II Appendix 11E:** Riparian Mammal Survey Report (**Application Document Ref. 6.3**)) with the exception of Drain 1 on the northern boundary of the Main Site which will be retained. 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.

~~11.7.67.~~11.7.68. Construction of the Main Site requires the permanent loss of water vole habitat associated with Drains A and 4 (see Figure 11E.1 presented in **ES Volume II Appendix 11E:** Riparian Mammal Survey Report (**Application Document Ref. 6.3**)) which supported a low population density (local nature conservation value) in 2023 (combined count of two burrows and 11 latrines, so likely comprising two water vole territories). A licence would be needed for the works affecting these drains to achieve legislative compliance. Drain 2 was not occupied in 2023 within the area that would be affected by habitat loss.

~~11.7.68.~~11.7.69. In addition, Drain 1 (Glew Drain) supported a high population density in 2023 (district value). This drain needs to be bridged for purposes of construction access or for the Emergency Vehicle Access Road. The design of the proposed bridge crossing avoids habitat severance so water voles will still be able to access suitable habitats. However, it is considered that the relevant works would need to be completed under licence to achieve legislative compliance due to the potential for disturbance of water vole.

~~11.7.69.~~11.7.70. Based on current levels of water vole activity, the Proposed Development is not likely to result in the loss of the water vole population from the Site. The majority of the population is in Drain 1 which will remain suitable for the species. 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, particularly with enhancement of habitat that is currently sub-optimal due to shading or loss of open water to emergent vegetation. However, this is dependent on the status of water vole remaining unchanged up until construction, and this is not certain (populations can decrease or increase

over time). Given this the identified mitigation approach (see Section 11.6 of this chapter), which is committed within the **Outline CEMP** (**Application Document Ref. 7.4**), will be followed to achieve legislative compliance. This mitigation is also sufficient to preclude potential for a significant effect on the conservation status water vole and its habitats, as this not permissible under the relevant legislation. The mitigation strategy will be confirmed in the Application with reference to the results of the 2024 top-up water vole survey.

~~11.7.70.~~11.7.71. Taking the above into account, including the legal requirement to maintain the conservation status of the species, 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 affected drains within the Main Site. Given this, and mandatory requirements for appropriate mitigation to deliver legislative compliance (as detailed is Section 11.6), there would be no likely impact on the nature conservation status of water vole. The potential construction effect on water vole is assessed as negligible (**not significant**).

Badger

~~11.7.71.~~11.7.72. See **ES Volume II Appendix 11D**: Confidential Badger Report (**Application Document Ref. 6.3**). Based on the findings of this report, the potential construction effect on badger is assessed as negligible (**not significant**).

Grass Snake

~~11.7.72.~~11.7.73. Construction works at the Main Site would result in the loss of minor field drains and 10.1ha of species-poor 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 Site, the possibility of occasional and transitory occurrences cannot be discounted, particularly in relation to habitats adjacent to the Stainforth and Keadby Canal (see **ES Volume II Appendix 11C**: Preliminary Ecological Appraisal (**Application Document Ref. 6.3**)).

~~11.7.73.~~11.7.74. 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 Keadby 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.

~~11.7.74.~~11.7.75. 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. This is addressed through the commitment for supervision of site clearance and relevant construction works by an ECoW (see the Impact Avoidance Measures detailed above in Section 11.6). With these embedded mitigation commitments, the potential for reptiles to be killed or injured will be negligible.

~~11.7.75.~~11.7.76. It is assessed that the Proposed Development would not adversely affect the nature conservation status of grass snake, so the effect is assessed as negligible (**not significant**).

Breeding Birds

~~11.7.76.~~11.7.77. 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 **ES Volume II Appendix 11G:** Breeding Bird Survey Report (**Application Document Ref. 6.3**)). In addition, the commitment to provide biodiversity enhancement under the terms of a LBMEP is considered sufficient to compensate for the minor permanent losses of nesting bird habitat (mainly improved grassland but also a small stand of trees) resulting from construction of the Proposed Development.

~~11.7.77.~~11.7.78. The potential effect on breeding birds is assessed as negligible (**not significant**).

Fish

~~11.7.78.~~11.7.79. The relevant potential construction impacts relate to installation of a cofferdam within the Stainforth and Keadby Canal, as described in **ES Volume I Chapter 5**: Construction Programme and Management (**Application Document Ref. 6.2**). The fish species recorded from these watercourses and their ecological requirements are identified in **ES Volume II Appendix 11F:** Aquatic Survey Report (**Application Document Ref. 6.3**). Of these, the fish species requiring specific assessment is European eel, on the basis that it is a species of conservation concern. In addition, as migratory species, the location of the Proposed Development could adversely

affect the ability of eel to access habitats of high functional importance to these species.

~~11.7.79.~~11.7.80. The implications of construction activities for fish habitats has been assessed in relation to the watercourse concerned i.e. the Stainforth and Keadby Canal. As this watercourse is subject to nature conservation designations, this habitat assessment can be found within the impact assessment at paragraphs 11.7.24 – 11.7.26 (Stainforth and Keadby Canal)) and is not repeated here. Instead, the purpose of this section is to assess the potential impact from installation of a cofferdam on individual fish species.

~~11.7.80.~~11.7.81. An adverse effect from underwater sound and vibration on the fish species likely to use the Stainforth and Keadby Canal is not likely on the basis of the precedent established for comparable construction works for the consented Keadby 2 Power Station and also the conclusions of the technical note on underwater sound prepared for the Keady CCS Power Station DCO Application (see Annex F of **ES Volume II Appendix 11F:** Aquatic Survey Report (**Application Document Ref. 6.3**)). It is reasonable to conclude that there is no likelihood of a significant effect on European eel or other fish within the canal given the works for Keadby 2 and Keadby CCS Power Stations were acceptable. It is expected that the same regulatory restrictions/requirements would be applied to the Proposed Development in support of this conclusion.

~~11.7.81.~~11.7.82. Considering the potential for fish species to become trapped within the cofferdam structure at installation and be affected by dewatering. Again, this risk would be appropriately managed to deliver legislative compliance (see Section 11.6) so again an adverse effect on the nature conservation status of fish species is not likely. The required fish protection measures will be set out in a Fish Management Plan and this commitment is captured within the **Outline CEMP** (**Application Document Ref. 7.4**).

~~11.7.82.~~11.7.83. Given these considerations, and while an impact on individual fish cannot be completely discounted, it is considered that piling is not likely to adversely affect the conservation status of fish species. Therefore, the potential construction effect is assessed as negligible (**not significant**).

Aquatic Invertebrates

~~11.7.83.~~11.7.84. Surveys for the Proposed Development have identified a single watercourse supporting a notable assemblage of aquatic invertebrates. This is Drain 1 (Glew Drain) on the northern boundary of the Main Site (see **ES Volume II Appendix 11F:** Aquatic Ecology Survey Report **Application Document Ref. 6.3**) which supports an assemblage of aquatic invertebrates of county value. This drain would be directly affected by construction of a

bridge crossing for the proposed Emergency Vehicle Access Road (see **ES Volume III Figure 3.3:** Indicative Parts of the Plan (**Application Document Ref. 6.4**)).

~~11.7.84.~~11.7.85. The construction disturbance would be small-scale and temporary and is not likely to adversely affect the conservation status of the aquatic invertebrate assemblage associated with Drain 1. Worst-case construction requirements would affect no more than 10 - 15m stretches of drain bank and channel. The worst-case combined habitat loss on Glew Drain would be 15m from a drain that is at least 1.7km long (0.9%). Therefore, assuming a worst-case, greater than 99% of the Glew Drain would remain suitable to support the aquatic invertebrate assemblage.

~~11.7.85.~~11.7.86. The localised and small-scale temporary 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 negligible (**not significant**).

Invasive Non-native Species of Plants and Animals

~~11.7.86.~~11.7.87. There is limited potential for construction of the Proposed Development to cause the spread of plant and animal INNS. **ES Volume II Appendices 11C :** Preliminary Ecological Appraisal and **11F :** Aquatic Ecology Survey Report (**Application Document Ref. 6.3**) 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 Site prior to construction;
- 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, curly waterweed, zebra mussel and demon shrimp are present within the Stainforth and Keadby Canal. The Canal and River Trust has also identified floating pennywort as a possible constraint (**ES Volume II Appendix 11F:** Aquatic Ecology Survey Report (**Application Document Ref. 6.3**)) at the location of the Proposed Canal Water Intake. These are relevant to the operation of the cooling water intake on the canal, due to the potential to clog screens and pipework.

~~11.7.87.~~11.7.88. There is potential for seeds/ propagules of the above relevant plant INNS (Nuttall's and curly waterweed, floating pennywort and (if it establishes in the future) wall cotoneaster) to be disturbed and transferred to new sites because 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 Site or at distance from the Proposed Development.

~~11.7.88.~~11.7.89. 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.

~~11.7.89.~~11.7.90. 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 is outlined in the **Outline CEMP** (**Application Document Ref. 7.4**) and the **Outline LBMEP Report** (**Application Document Ref. 5.11**) that accompany Application.

~~11.7.90.~~11.7.91. There is a requirement for mitigation to be applied effectively to provide legal compliance (see Section 11.6). 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

~~11.7.91.~~11.7.92. To enable a focussed impact assessment, an initial screening exercise has been completed (refer to **ES Volume II Appendix 11C:** Preliminary Ecology Appraisal (**Application Document Ref. 6.3**)) 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 11.6. 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.

~~11.7.92.~~11.7.93. 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; and

- disturbance impacts - external operational lighting and noise has potential to affect bats where it coincides with their foraging and commuting habitats.

~~11.7.93.~~11.7.94. The potential impacts and resultant effects during the operational phase of the Proposed Development on those ecological features that have been scoped into the impact assessment are considered further below.

Humber Estuary SSSI, SAC, SPA and Ramsar Site - emissions to air and water

~~11.7.94.~~11.7.95. The potential impacts and resultant effects relating to air emissions from the Proposed Development, in combination with background levels (which have been modified to include the future contribution from the Keadby 2 Power Station) on the Humber Estuary designations are assessed in the operational air quality impact assessment provided as **ES Volume II Appendix 8B**: Air Quality Operational Phase (**Application Document Ref. 6.3**).

11.7.96. The assessment of emissions to air has considered the qualifying habitat features within the zone of influence relevant to the operational assessment i.e.:

- estuaries – a composite habitat encompassing the main river channel and the habitats listed below;
- mudflats and sandflats not covered by seawater at low tide – encompassing the marginal mud banks exposed at low tide;
- pioneer saltmarsh;
- upper saltmarsh; and
- common reed vegetation fringing the River Trent.

11.7.97. The qualifying mudflat and river habitats present in the affected area are not sensitive to nitrogen deposition as they do not support vegetation[4].

11.7.98. Two types of saltmarsh vegetation are identified as qualifying features i.e. '*Salicornia* and other annuals colonising mud and sand' pioneer saltmarsh,

[4] Fluvial nitrogen inputs can be related to excessive macroalgal growth in the marine environment but recent Natural England guidance to planners issued in March 2022

and Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) which is upper saltmarsh. The former pioneer saltmarsh vegetation only develops at the lower reaches of saltmarshes, so it is restricted to the main Estuary[5] and does not occur on the River Trent at Keadby and therefore does not require assessment in relation to OE1-5 (although it has been modelled). However, an impact assessment is provided below for the pioneer saltmarsh where it occurs at the main Estuary.

11.7.99. The air quality assessment predicts a worst-case nutrient nitrogen deposition of 0.32 kg N/ha/year at the Humber Estuary designations. Utilising the worst-case precautionary critical load for upper saltmarsh, the nitrogen deposition at OE1-5 equates to 3.2% of the lower critical load of 10kgN/ha/yr. In combination with the background concentrations (which includes Keadby 2), the PCs are 167% and therefore exceed the threshold for insignificance.

11.7.100. APIS indicates that the potential impact from nitrogen on upper saltmarshes relates to the promotion of dominance of grass species to the detriment of the wider flora. However, the precise type of upper saltmarsh for which the Humber Estuary is designated, i.e. the Atlantic salt meadows habitat, shows considerable variation particularly where there are transitions to other habitats and depending on the position within the estuary and the associated tidal regime. Some communities are more species-poor and grassy in character than others, so the response to nitrogen will equally be variable. This is important context for the assessment of impacts. The Environment Agency has mapped the saltmarsh along the River Trent and concluded that the upper saltmarsh is vegetation characterised by "*Festuca rubra, Elytrigia dominant marsh, Bolboschoenus, Juncus dominant marsh*" (Environment Agency, 2014; Hambidge & Phelan, 2014). In other words, vegetation dominated by grasses and grass-like species and ~~is~~ likely to be of low sensitivity to additional nitrogen (as explored in more detail within the **Habitats Regulations Assessment (HRA) Appropriate Assessment Report** (**Application Document Ref. 5.2**)).

11.7.101. The air quality assessment has also considered the potential for air quality impacts to common reed vegetation at Keadby (OE1-5) and other qualifying

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does not identify the Humber Estuary as being an affected European site for which this is a concern, and fluvial and marine sources of nitrogen will dwarf inputs from the atmosphere.

[5] Mapping showing the location of the relevant saltmarsh habitat can be found at https://environment.data.gov.uk/explore/6da82900-d465-11e4-8cc3-f0def148f590?download=true – the relevant community is coloured red.

reedbed habitats located at the main Humber Estuary (Receptor ID OE32). At both locations the most sensitive qualifying habitats align best with the APIS habitat type of rich fen (albeit this alignment is very precautionary in relation to the riparian common reed vegetation at Keadby). This has a lower critical load of 15kgN/ha/yr. In relation to the riparian common reed vegetation fringing the River Trent at Keadby (OE1-5), the worst-case nitrogen deposition is 2.1% of the critical load. The PEC is 111 and the critical load is exceeded.

11.7.102. The assessment of common reed vegetation against the rich fen habitat type is overly precautionary. Rich fens are wetlands fed by mineral-enriched calcareous waters and where common reed is present it is usually mixed with a variety of other herbaceous species. Whereas the riparian vegetation being assessed fringes a large tidal river (under the UK Habitat Classification this would be 'aquatic marginal vegetation' not 'reedbed') and is inundated during high tides. Common reed is overwhelmingly dominant within this habitat, as is typical for rivers within the tidal influence (as documented on the citation for the Ramsar site designation), to the almost complete exclusion of herbaceous species (as described in paragraph 11C.4.36 of **ES Volume II Appendix 11C - Application Document Ref. 6.3**), and an absence of typical rich fen herbaceous species.

11.7.103. The potential impact of nitrogen deposition on rich fen relates to its role as a fertiliser that promotes the growth of tall, robust vascular plant species including grasses such as common reed, at the expense of more sensitive species. Therefore, in this case the impact would not be realised as this is already, and quite naturally, a species-poor community dominated by common reed. Deposition of nitrogen is therefore not likely to affect the composition, structure or integrity of this habitat, or alter its suitability/functionality to birds. The very small contribution of nitrogen from the Proposed Development is also likely to be outweighed by the removal of nutrients via scour and flushing by the tide.

~~11.7.95.~~11.7.104. The closest mapped occurrence of the pioneer saltmarsh qualifying feature (the most sensitive qualifying habitat in the zone of influence) is more than 9km to the northwest and coincides more closely with the Humber receptor OE32 (refer to **ES Volume II Appendix 8B:** Air Quality Operational Assessment (**Application Document Ref. 6.3**)). This has a PC of 0.09kg N/ha/yr, which represents 0.9% of the lower Critical Load and therefore would be screened as being insignificant. Consequently, at this location there would be no exceedances of the critical load for this, or any other, habitat. ~~This equates to 3.2% of the critical load for upper-mid and mid-low saltmarsh habitats. However, as explained in more detail in the **HRA Appropriate Assessment Report** (**Application Document Ref. 7.12**) and agreed with Natural England for the Keadby CCS Power Station DCO, this type of saltmarsh is not present in the zone of influence for a potential nitrogen impact. Instead, the vegetation closest to the Proposed Development is~~

~~considered to be transitional reedbed which is a species-poor plant community that is not sensitive to additional nitrogen. Further, the qualifying mudflat and estuary habitats present in the affected area are not sensitive to nitrogen deposition as they do not support vegetation[6].~~

~~11.7.96. The SAC qualifying saltmarsh is specifically 'Salicornia and other annuals colonising mud and sand' which is a pioneer community that would occur within the main Humber Estuary area. The community of relevance is therefore only considered to occur at the estuary proper[7], at the mouth of the River Trent. This is closer to the location of the Humber receptor OE32 (refer to **ES Volume II Appendix 8B:** Air Quality Operational Assessment (**Application Document Ref. 6.3**)), which has a PC of 0.09kg N/ha/yr, which represents 0.9% of the Atlantic upper-mid & mid-low salt marshes lower Critical Load and therefore would be screened as being insignificant~~

~~11.7.97.~~11.7.105. ~~So~~Given the foregoing, effects from nutrient nitrogen deposition are predicted to be negligible and **not significant**.

~~11.7.98.~~11.7.106. For all other atmospheric pollutants (NOx, ammonia and acid deposition), the PCs are below the criteria for insignificance or otherwise the critical loads/levels are not predicted to be exceeded at the Humber Estuary designations as a result of the Proposed Development, so the effects are all also predicted to be negligible and **not significant**.

~~11.7.99.~~11.7.107. **ES Volume I Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**) and the related WFD Assessment (**ES Volume II Appendix 12B:** WFD Assessment (**Application Document Ref. 6.3**) both assess the potential water quality impacts and effects on the Humber Estuary designations and their associated species and habitat features of interest. This includes assessment of the impacts of discharging treated effluent to the River Trent via the existing water discharge connection from Keadby 1 Power Station. The assessment includes consideration of potential physico-chemical effects from residual biocides within the cooling

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~~[6] Fluvial nitrogen inputs can be related to excessive macroalgal growth in the marine environment but recent Natural England guidance to planners issued in March 2022 does not identify the Humber Estuary as being an affected European site for which this is a concern, and fluvial and marine sources of nitrogen will dwarf inputs from the atmosphere.~~

~~[7] Mapping showing the location of the relevant saltmarsh habitat can be found at https://environment.data.gov.uk/explore/6da82900-d465-11e4-8cc3-f0def148f590?download=true – the relevant community is coloured red.~~

water blowdown returned and thermal uplift affects due to the increased temperature of the water returned to the River Trent.

~~11.7.100.~~11.7.108. It is noted that the discharge of treated effluent will require a permit from the Environment Agency, which will control the volumes and rates of abstraction, and the effluent quality and rates of discharged waters considering the requirements to maintain the biodiversity and nature conservation status of the River Trent and the Humber Estuary designations, including WFD objectives. The treated effluent discharge from the Proposed Development will be within the parameters considered and agreed previously when determining the application for the consented Keadby CCS Power Station. The treated effluent 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.

~~11.7.101.~~11.7.109. The Proposed Development will not 'in combination' add to the existing combined baseline water discharge volume and temperature from Keadby 1 and Keadby 2 Power Station. It is anticipated that the volume of discharge from the Proposed Development will be less than 1m^3/s and would discharge intermittently, in combination with the 0.016m^3/s that is discharged from Keadby 2 Power Station. As such it is considered that the Proposed Development will be operating well within the parameters of what was determined to be not significant for Keadby 1 Power Station, where the existing permit (EPR/YP3133LL/V011) allows a maximum daily discharge of 15m^3/s (average of 24-hour period).

~~11.7.102.~~11.7.110. Similarly, there will be no change to the temperature status of the River Trent beyond what is currently permitted. The discharge temperature will continue to comply to the existing absolute temperature discharge limit of 35°C for the cooling water outflow into the K1 cooling water culvert, which has been set as the level need to avoid environmental harm. Keadby CCS Power Station has already been granted an amended environmental permit (EPR/YP3133LLv013) to discharge within these parameters. If the Proposed Development progresses instead of Keadby CCS Power Station it would be able to discharge within the parameter constraints of the existing Keadby 3 permit.

~~11.7.103.~~11.7.111. As such, no adverse effects on the Humber Estuary designations are predicted. The application of existing statutory regulatory regimes and permitting is sufficient to prevent this.

~~11.7.104.~~11.7.112. ~~No other pathways are identified that could result in adverse operational impacts and effects on statutory nature conservation~~

~~designations.~~ The predicted effect ~~on all European sites and statutory nature conservation designations~~ is therefore negligible (**not significant**).

All Other European Sites and National Nature Conservation Designations - emissions to air and water

~~11.7.105.~~11.7.113. The potential impacts and resultant effects relating to air emissions from the Proposed Development, in combination with background levels (which have been modified to include the future contribution from the Keadby 2 Power Station) on the identified SSSIs are assessed in the operational air quality impact assessment provided as **ES Volume II Appendix 8B**: Air Quality Operational Phase (**Application Document Ref. 6.3**).

~~11.7.106.~~11.7.114. The air quality assessment predicts a potential nutrient nitrogen deposition impact at two national nature conservation designations – Crowle Borrow Pit SSSI and Risby Warren SSSI.

~~11.7.107.~~11.7.115. The qualifying broadleaved deciduous wet woodland habitat type at the Crowle Borrow Pits receptor OE6 (refer to **ES Volume II Appendix 8B** (**Application Document Ref. 6.3**)) has a ~~process contribution (PC)~~ PC representing 1.1% of the lower Critical Load value for the worst case operating scenario (100% natural gas firing). Against the upper end of the Critical Load range the PC would represent 0.7%. For the 100% hydrogen firing scenario, which will be the main mode of operation once hydrogen becomes available to the site, the PC reduces to represent 1.0% of the lower Critical Load value. The background deposition at the site is already 284% of the lower Critical Load value. There is no exceedance of the Critical Load in relation to the other qualifying habitat of the SSSI i.e. tall herb fen.

11.7.116. The condition assessment of the wet woodland conducted by Natural England in 2021 provides informative context. It clarifies that this is mature woodland subject to a non-intervention management regime such that the tree cover is dense and the ground flora is typical for eutrophic wet woodland being "*dominated by tussocky sedges alongside some ferns, nettles, ground ivy, water mint, bittersweet.*" The woodland at Crowle Borrow Pit is currently in an unfavourable condition, due to ash dieback and lack of regeneration of trees, which are factors that are unlikely to be related to nitrogen deposition. Reduction in nitrogen levels would not assist tree regeneration as the limiting factor is the lack of open space due to the existing tree cover. Natural England records that trees are not regenerating because "*there is not enough open conditions for seedling growth within the SSSI at present but this will change over time as trees fall and the canopy opens.*"

11.7.117. Being floodplain wet woodland subject to periodic inundation it is likely that inputs of nitrogen from sources other than atmospheric deposition will

dominate, and Natural England has confirmed agreement on this point. As such there would be no likely harm from the additional minor contribution of 0.11kgN/ha/yr from the Proposed Development, particularly in the context of a baseline that is already in marked excess of the Critical Load, with a ground flora characteristic of eutrophic swampy conditions, and with no recorded issues with the condition of the habitat that can be attributed to nitrogen deposition.

~~11.7.108.~~ ~~In addition, the woodland is floodplain wet woodland and the identified ground flora is already, and likely naturally, eutrophic in character.~~Given the foregoing, i~~I~~t is therefore considered that the 1.1% increase associated with the natural gas firing scenario~~,~~ would be unlikely to impact the unfavourable condition of the site~~, given the very high background nitrogen deposition already received by the SSSI. Additionally, air quality is not an identified pressure on this site~~.

~~11.7.109.~~11.7.118. So, effects from nutrient nitrogen deposition at Crowle Borrow Pit SSSI are predicted to be negligible and **not significant**.

~~11.7.110.~~11.7.119. The PC of nitrogen at Risby Warren SSSI (receptor OE12) represents 1.3% of the lower Critical Load of 5kgN/ha/yr set for all of the qualifying habitat features of the SSSI (~~for the Inland sanddrift and dune with siliceous grassland habitat type~~with the exception of the lowland dry acid grassland habitat feature. Against the upper Critical Load the PC would represent 0.4%-0.6% (dependent on habitat) and therefore would be significantly less than the 1% screening criteria. For the hydrogen firing scenario, the PC reduces to 1.1% of the lower Critical Load.

11.7.120. The background deposition at Risby Warren is already 350% of the lower Critical Load value for most habitats (excluding the dry acid grassland) and therefore it is highly unlikely that the predicted additional deposition from the Proposed Development would impact the site further, given that it represents only 0.4% of the existing deposition. The most recent condition assessments published by Natural England record that despite the very high background nitrogen deposition, these habitats are otherwise in favourable condition or unfavourable – recovering condition. The historic issues relating to the latter were lack of adequate scrub and bracken control and a lack of optimal grazing pressure, rather than pollution pressures. By addressing these factors the condition of the habitats has been maintained or improved. Consequently, the small additional contribution of the Proposed Development to nitrogen deposition is not likely to be adverse for these habitats.

11.7.121. The PC of nitrogen to the lowland dry acid grassland habitat of Risby Warren SSSI (receptor OE12) represents 1% of the lower Critical Load of 6kgN/ha/yr set for this habitat. Against the upper Critical Load the PC would represent 0.6% and therefore would be significantly less than the 1% screening criteria.

For the hydrogen firing scenario, the PC reduces to below 1% of the lower Critical Load. The background deposition at Risby Warren is already 294% of the lower Critical Load value for this habitat and therefore it is highly unlikely the predicted additional deposition from the Proposed Development would impact the site further, given that worst-case it represents only 0.4% of the existing deposition.

~~11.7.111.~~11.7.122. ~~Further t~~The condition assessment of the SSSI published by Natural England indicates that most types of acid grassland within the SSSI are in unfavourable – recovering condition. The historic issues relating to the latter were lack of adequate scrub and bracken control and a lack of optimal grazing pressure, rather than pollution pressures. By addressing these factors the condition of the habitats has been improved. Consequently, the small additional contribution of the Proposed Development to nitrogen deposition is not likely to be adverse for these habitats. The exception is the lichen-rich element of the acid grassland that was historically present but is concluded as lost within the Natural England condition assessments due to historic and ongoing air pollution (as reflected in the background gross exceedance of the lower Critical Load for nitrogen). ~~the elements of the qualifying feature (lichen heath) of particular sensitivity to nitrogen deposition have already been lost due to the existing baseline load.~~

~~11.7.112.~~11.7.123. Although nitrogen deposition is recognised as a barrier to recovery of the condition of the ~~designated interest (lichen heath/~~lichen-rich dry acid grassland~~,)~~ a significant reduction in nitrogen deposition would be required to recover the interest feature (refer to Annex 8B3 of **ES Volume II Appendix 8B**: Air Quality Operational Phase (**Application Document Ref. 6.3**)), and the impacts associated with the Proposed Development ~~could~~ can be considered inconsequential to this. Mitigation of the small nitrogen contribution from the Proposed Development would achieve no measurable benefit for Risby Warren SSSI or make it any more likely that nitrogen deposition could be reduced to levels below the lower Critical Load. Put simply, existing agricultural and shipping sources of nitrogen preclude this. The published trends within APIS indicate these sources are increasing over time and there is no identified likely mechanism for the substantive reduction of these sources over the operational life of the Proposed Development. Without this, mitigation of the worst-case contribution of 0.06kgN/ha/yr attributable to the Proposed Development is meaningless and distracts from the broader issues that need to be addressed.

~~11.7.113.~~11.7.124. So, effects from nutrient nitrogen deposition at Risby Warren SSSI are predicted to be negligible, as they could not worsen the condition of the qualifying habitat features further and are inconsequential~~trivial~~ to the substantive broader measures needed to recover the acid grassland interest

of the site~~,~~. Therefore the effect is predicted to be negligible and **not significant**.

~~11.7.114.~~11.7.125. The 1% threshold is not exceeded at any other European and nationally designated sites. So, effects from nutrient nitrogen deposition are predicted to be negligible and **not significant**.

11.7.126. A similar rationale can be presented in relation to ammonia levels at Risby Warren SSSI. **ES Volume II Appendix 8B** (**Application Document Ref. 6.3**) predicts a PC of 0.01µg/m3 which represents 1% of the lower Critical Level value for ammonia of 1µg/m3 (which has been used given that lichens are integral to at least some of the qualifying habitat features of the SSSI). However, the background level is already 191% of the lower Critical Level value, with the PEC negligibly increasing this to 192% of the lower Critical Level value. Most of the qualifying habitats of the SSSI are reported to be in favourable or unfavourable – recovering condition despite this (see above), except for the historically occurring lichen-rich dry acid grassland.

11.7.127. It is emphasised that the assessment of ammonia is highly precautionary. Emissions of ammonia would only occur because of the SCR abatement potentially required to meet the BAT-AELs for NOx. For the Proposed Development, the requirement for SCR will depend on the final CCGT selection, and some CCGT Original Equipment Manufacturers have indicated this may not be required. If SCR were needed, it is likely that the actual annual emissions would be less than the 3mg/Nm^3 assessed in the model, which has been demonstrated by the operation of Keadby 2, which to date has measured annual emissions of NH3 below 1mg/Nm^3 compared to the permitted emission limit of 3.8mg/Nm^3. If emission concentrations were <1mg/Nm^3, the actual impact from the Proposed Development would be less than 1% of the critical level for ammonia at Risby Warren SSSI (refer to Annex 8B3 of **ES Volume II Appendix 8B**: Air Quality Operational Phase (**Application Document Ref. 6.3**)).

11.7.128. Further, as most ammonia emissions come from agricultural sources this is likely to be the prevailing source at the SSSI given it is surrounded by a landscape in agricultural use. Industrial sources within Scunthorpe, which is in closer proximity to the SSSI than the Proposed Development, are also likely to be substantive contributors to the ammonia received at the SSSI. Until these sources of ammonia located closest to the SSSI are addressed, ammonia levels are not likely to fall sufficiently to allow potential for recovery of the lichen-rich dry acid grassland irrespective of any additional contribution from the Proposed Development. The practicality of restoration would also

require a concomitant reduction in nitrogen deposition which, as explained above, is not realistically likely.

11.7.129. So, effects from ammonia at Risby Warren SSSI are predicted to be negligible, as they could not worsen the condition of the lichen-rich dry acid grassland further and are meaningless in the context of the broader measures needed to recover the lichen-rich dry acid grassland, and **not significant**.

11.7.130. The 1% threshold is not exceeded (with respect to the most appropriate Critical Level identified in **ES Volume II Appendix 8B**: Air Quality Operational Phase (**Application Document Ref. 6.3**)) at any other European and nationally designated sites. So, effects from ammonia are predicted to be negligible and **not significant**.

~~11.7.115.~~11.7.131. For all other atmospheric pollutants (NOx~~, ammonia~~ and acid deposition), the PCs are below the criteria for insignificance or otherwise the critical loads/levels are not predicted to be exceeded at any European or nationally designated sites as a result of the Proposed Development, so the effects are all also predicted to be negligible and **not significant**.

Non-Statutory Nature Conservation Designations - emissions to air and water abstractions

~~11.7.116.~~11.7.132. The potential impacts and resultant effects relating to air emissions on the identified relevant LWS within 2km of the Proposed Development are assessed in **ES Volume II Appendix 8B**: Air Quality Operational Phase (**Application Document Ref. 6.3**). This air quality impact assessment indicates potential for an impact from nitrogen deposition at the Keadby Wetlands LWS.

~~11.7.117.~~11.7.133. At the Keadby Wetland LWS, the predicted nitrogen dose is 0.4kgN/ha/yr (4% of the lower critical load) in the context of background deposition (including Keadby 2 Power Station) of 29.5kgN/ha/yr (modified to include the contribution from Keadby 2 Power Station). The background dose is already almost three times higher than the 10kgN/ha/yr critical load set for the most nitrogen sensitive habitats (wet woodland) potentially present. This assessment is likely to be overly precautionary, as the vegetation described on the LWS citation is a '*dense mixture of: willow scrub; other scrub and trees; tall wetland vegetation with much common reed, as well as bulrush, great willowherb and reed canary-grass; and ruderal species such as nettles and thistles*.'

~~11.7.118.~~11.7.134. Further, the citation records vegetation so dense that the LWS '*proved impossible to traverse*.' Therefore the LWS is a closed community of scrub vegetation and robust grass and herb community typical of eutrophic

wetland habitats (as clearly discernible from drone photography collected in June 2024 that is available within the Google Earth website). As such, further additions of nitrogen would not reasonably be expected to be detrimental to the botanical interest of the LWS as the vegetation is already of a wetland type that would be expected under enriched conditions. Consequently, the effect is likely to be negligible and **not significant.**

~~11.7.119.~~11.7.135. All other non-statutory nature conservation designations and potential air quality impacts and effects are scoped out as in all cases the 1% threshold for insignificance is not predicted to be exceeded. So the effect is negligible and **not significant**.

~~11.7.120.~~11.7.136. The abstraction of cooling water from the Stainforth and Keadby Canal LWS will be undertaken in accordance with a water abstraction licence granted by the Environment Agency, which will specify the maximum volumes and rates of abstraction permitted to maintain the biodiversity and nature conservation status of the Stainforth and Keadby Canal LWS. The Keadby 2 Power Station abstraction licence (MD/028/0083/014) was varied in 2022/2023 to include the additional abstraction required for the Keadby 3 CCS Power Station project. As the Proposed Development is an alternative to Keadby 3 CCS Power Station, with a lower cooling water demand, this abstraction licence is anticipated to be re-allocated to the Proposed Development.

~~11.7.121.~~11.7.137. **ES Volume I Chapter 12:** Water Environment and Flood Risk (**Application Document Ref. 6.2**) 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 and no adverse effects on the LWS are predicted. The application of existing statutory regulatory regimes and permitting is sufficient to prevent this.

~~11.7.122.~~11.7.138. No other pathways are identified that could result in adverse impacts and effects on non-statutory nature conservation designations.

Habitats - Acid Grassland Habitats and Open Mosaic Habitats on Previously Developed Land

~~11.7.123.~~11.7.139. The former Keadby Ash Tip contains 7.9ha of unimproved acid grassland habitat and 15.4ha of open mosaic habitats on previously developed land (commonly referred to as ‘OMH’), and these habitats are considered sensitive to potential effects of emissions to air from operation of the Main Site. These habitats have been assessed as having national value

(see **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal (**Application Document Ref. 6.3**).

~~11.7.124.~~11.7.140. Although not afforded any nature conservation designation, to ensure a conservative approach to assessment, the potential impacts and resultant effects relating to air emissions on these habitats has been assessed in **ES Volume II Appendix 8B:** Air Quality Operational Assessment (**Application Document Ref. 6.3**). In all cases, the 1% threshold for insignificance is not predicted to be exceeded, so the effects from NO_x, ammonia, nutrient nitrogen deposition and acid deposition are all anticipated to be negligible.

~~11.7.125.~~11.7.141. The predicted effect on these habitats of national nature conservation value is therefore negligible (**not significant**).

Species - Fish

~~11.7.126.~~11.7.142. 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 and the Stainforth and Keadby Canal. Any future 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 and agreed previously with the MMO, maintenance activities are not likely to result in significant adverse effects on fish.

~~11.7.127.~~11.7.143. A WFD Assessment has been prepared for the Proposed Development and is included in **ES Volume II Appendix 12B:** WFD (**Application Document Ref. 6.3**). 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.

~~11.7.128.~~11.7.144. 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/ or 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, and comparable to those already in operation at the Keadby 1 Power Station. Given this, water abstraction and discharge for the Proposed Development is not considered likely to have a significant effect on fish or their habitats.

~~11.7.129.~~11.7.145. The potential for fish entrainment and impingement will be controlled through the committed eel screens the design parameters for which need to be agreed with the Environment Agency (the regulator) to protect all species of fish, including sensitive life stages of European eel and lamprey species. As such, this is a matter that does not require further assessment. The committed design measures combined with statutory regulatory regimes are considered appropriate to avoid significant adverse effects on fish from entrainment and impingement.

~~11.7.130.~~11.7.146. Biocides will 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 needs to be considered in relation to their potential to affect fish. It is considered that correct application of existing statutory regulatory regimes 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 treated effluent to the River Trent 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. Discharges will be similar or lower than those from the operational Keadby 1 power station. The treated effluent 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.

~~11.7.131.~~11.7.147. Effluent will be treated and mixed with the treated effluent from the existing Keadby 2 Power Station at source and then will enter the existing Keadby 1 Power Station cooling water discharge pipeline via which it will ultimately discharge to the River Trent through the existing operational outfall structure. The temperature of the final effluent discharge and its implications for the temperature of the River Trent is considered in **ES Volume I Chapter 12**: Water Environment and Flood Risk (**Application Document Ref. 6.2**). There will be no change to the temperature status of the River Trent beyond what is currently permitted. The discharge temperature will continue comply to the existing absolute temperature discharge limit of 35°C for the cooling water outflow into the K1 cooling water culvert, which has been set as the level need to avoid environmental harm. Keadby CCS Power Station has already been granted an amended environmental permit (EPR/YP3133LLv013) to discharge within these parameters. If the Proposed Development progresses instead of Keadby CCS Power Station it would be

able to discharge within the parameter constraints of the existing Keadby CCS permit.

~~11.7.132.~~11.7.148. Given the above, thermal impacts from the discharge of treated effluent are not likely to have an adverse effect on the conservation status of fish or other aquatic species using the River Trent.

~~11.7.133.~~11.7.149. Given the above, it is concluded 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 negligible (**not significant**).

Bats

~~11.7.134.~~11.7.150. 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.

~~11.7.135.~~11.7.151. At the location of the Main Site, surveys in 2017 and 2020 recorded only very low levels of activity by common bat species (see Annexes 4 and 5 of **ES Volume II Appendix 11C:** Preliminary Ecological Appraisal **Application Document Ref. 6.3**). 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 when compared with the extensive availability of suitable habitats in the wider landscape.

~~11.7.136.~~11.7.152. As described in **ES Volume I Chapter 4**: Proposed Development (**Application Document Ref. 6.2**), an **Outline Lighting Strategy** accompanies the Application (**Application Document Ref. 5.11**), setting out how lighting impacts on sensitive ecological receptors, including those habitats used by bats, have been considered and addressed.

~~11.7.137.~~11.7.153. 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 negligible (**not significant**).

Terrestrial Invertebrates

~~11.7.138.~~11.7.154. Air quality impacts have been assessed in **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**), 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 negligible (**not significant**).

Flora

~~11.7.139.~~11.7.155. Air quality impacts have been assessed in **ES Volume I Chapter 8:** Air Quality (**Application Document Ref. 6.2**), 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 of national value. 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 negligible (**not significant**).

Invasive Non-native Species of Plants and Animals

~~11.7.140.~~11.7.156. 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 via the Canal Water Abstraction from the Stainforth and Keadby Canal, which after operational use would then be routed to the existing water discharge connection from Keadby 1 Power Station to the River Trent.

~~11.7.141.~~11.7.157. The potential for aquatic plant INNS (see **ES Volume II Appendices 11C:** Preliminary Ecological Appraisal and **11F**: Aquatic Ecology Survey Report (**Application Document Ref. 6.3**) to be drawn into the water supply via the Canal Water Abstraction will be managed 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). Screens will provide an obstruction for aquatic plant INNS at source.

~~11.7.142.~~11.7.158. 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 Nuttall's waterweed within the Trent catchment (Stroh *et al.*, 2023), there are also numerous existing upstream sources for the relevant plant INNS along the River Trent.

~~11.7.143.~~11.7.159. A similar rationale can be presented for the aquatic animal INNS (zebra mussel and demon shrimp, see **ES Volume II Appendix 11F:** Aquatic Ecology Survey Report (**Application Document Ref. 6.3**) 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.

~~11.7.144.~~11.7.160. Irrespective of the existing pathways which may exist via watercourse connections, it is 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 routine operational preventative maintenance measures will remove this potential pathway for spread.

~~11.7.145.~~11.7.161. No likely significant impacts and effects from plant and animal INNS are therefore anticipated as a result of operation of the Proposed Development.

Decommissioning

~~11.7.146.~~11.7.162. 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 **ES Volume I Chapter 4**: The Proposed Development (**Application Document Ref. 6.2.4**), 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.

~~11.7.147.~~11.7.163. Requirements to remove above ground infrastructure means that decommissioning activities would be predominantly restricted to within the built footprint of the Proposed Development. Where vegetation is affected, it is most likely to be soft landscaping planted within the built layout of the Main Site. Some of this vegetation could have established a biodiversity value that would need to be addressed and managed appropriately during decommissioning in accordance with planning policy and legislation at that time e.g. use by nesting birds.

~~11.7.148.~~11.7.164. As described in Section 11.6, 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. Protected species and INNS surveys will be commissioned as appropriate to inform the scope of the DEMP. This is discussed further within **ES Volume I Chapter 4**: Proposed Development (**Application Document Ref. 6.2.4**). The DEMP will be secured by a Requirement in the **Draft DCO** (**Application Document Ref. 3.1**).

~~11.7.149.~~11.7.165. On this basis, no significant adverse effects are anticipated as a result of the decommissioning of the Proposed Development.

11.8. Mitigation, Monitoring and Enhancement Measures

Construction Mitigation

11.8.1. The assessment as presented herein indicates that the Proposed Development is not likely to generate any significant adverse effects on most habitats and species during construction.

11.8.2. Section 11.6 described the embedded mitigation measures that would be undertaken to avoid adverse direct effects on all other habitats and species and to achieve legal compliance. These measures are incorporated into the **Outline CEMP** (**Application Document Ref. 7.4**), and they are also carried over into the **Outline LBMEP Report** (**Application Document Ref. 5.11**), final versions of which will be secured by requirements in the **Draft DCO** (**Application Document Ref. 3.1**). In summary, these include:

- A Water Vole Impact Avoidance 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.

- 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 required for construction of the Canal Water Abstraction on the Stainforth and Keadby Canal.
- 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.

11.8.3. A INNS desk study and survey will be undertaken prior to construction to determine the current location and extent of plant INNS, and to inform specification of the ISMP. The ISMP would specify the measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations (refer to Section 11.6 for the full detail).

Operation Mitigation

11.8.4. No mitigation measures are considered necessary during operation of the Proposed Development. Compliance with relevant permits (to be agreed with relevant regulators post-consent) and Requirements as set out in the draft DCO submitted with the Application (**Application Document Ref. 3.1**) are considered appropriate to manage the potential for adverse environmental and ecological effects.

Decommissioning Mitigation

11.8.5. 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 **ES Volume I Chapter 4**: Proposed Development (**Application Document Ref. 6.2.4**)

Enhancement/ Biodiversity Net Gain

11.8.6. The **Outline LBMEP Report** (**Application Document Ref. 5.11**) sets out the biodiversity enhancement proposals and the habitat management and monitoring proposed to deliver these. It will also confirm that the proposed enhancement measures are suitable to achieve no net loss and a net gain in biodiversity within the Site. It is proposed that submission and approval of the

final LBMEP will be secured by a Requirement of the **Draft DCO** (**Application Document Ref. 3.1**).

11.8.7. It is demonstrated in the Outline LBMEP that the above measures are suitable to achieve a gain for biodiversity in accordance with the relevant planning policy (there is no legislative regime applicable to NSIPs at the current time and this will not come into force before May 2026).

Monitoring

11.8.8. 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 the construction phase will be set out in the final CEMP. In particular, an ECoW would be employed to oversee the delivery of all necessary mitigation, including any mitigation to be completed under relevant species mitigation licences.

11.8.9. Habitat monitoring will be needed for a defined period during operation to measure and confirm successful establishment and management of the committed measures. The need for such monitoring will depend on the final selection of construction locations and methods, and therefore this will be detailed in the final LBMEP which will be secured as a Requirement of the **Draft DCO (Application Document 3.1)**.

11.8.10. The anticipated requirements for post-construction monitoring of the establishment of landscape and biodiversity enhancement measures are outlined in the **Outline LBMEP Report** (**Application Document Ref. 5.13**).

11.9. Limitations or Difficulties

11.9.1. Baseline conditions and relevant biodiversity and nature conservation features have been determined using appropriate methods in accordance with the approach agreed during scoping and subsequent engagement with stakeholders.

11.9.2. Where surveys have not been possible or work was ongoing at the time of preparation of the EcIA for the Application, then an appropriate precautionary (worst-case) assessment has been made with reference to the data collected for the Keadby CCS Power Station DCO.

11.9.3. All habitats and species have been valued in accordance with the precautionary principle, i.e. the maximum likely nature conservation value

has been applied based on the information available to inform decision-making on this.

11.9.4. For the purposes of worst-case assessment and pending further information on the layout of the Main Site (including ancillary facilities) and temporary construction laydown areas, it has been assumed that all semi-natural habitats present within the Main Site would be lost during construction. Unless stated otherwise, elsewhere within the Site, it is assumed that only temporary ground disturbances will be required, e.g. for laying of pipelines and cables, followed by appropriate reinstatement of affected areas of vegetation.

11.10. Summary of Likely Significant Residual Effects

11.10.1. It has been possible to design and position the Proposed Development with reference to the existing baseline conditions and through so doing avoid potential pathways for impact. As a consequence, no significant adverse residual construction, operation or decommissioning effects are anticipated as a result of construction of the Proposed Development.

11.10.2. Proposals suitable to achieve benefits for biodiversity as a direct consequence of the Proposed Development will be described and demonstrated within the **Outline LBMEP Report** that accompanies the Application (**Application Document 5.11**).

11.11. References

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