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9. ECOLOGY

9.1. Introduction

9.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) addresses the potential effects of the Proposed Development on ecology features.

9.1.2 The ecological impact assessment considers:

- The present-day and future baseline conditions during construction and at operation;
- The effects of construction of the Proposed Development on habitats and species, with respect to noise, construction traffic, construction dust, surface water pollution and the Proposed Development footprint;
- The effects of the operation of the Proposed Development on habitats and species with respect to noise, surface water pollution, air quality and visual impacts; and
- The effects of decommissioning of the Proposed Development on habitats and species.

9.1.3 This chapter is supported by the following technical appendices, located in PEIR Volume 3:

- Appendix 9A – Preliminary Ecological Assessment (PEA);
- Appendix 9B – HRA Signposting Report;
- Appendix 9C – Great Crested Newt Survey;
- Appendix 9D – Wintering Bird Survey;
- Appendix 9E – Breeding Bird Survey;
- Appendix 9F – Terrestrial Invertebrate Survey;
- Appendix 9G – Reptile Survey; and
- Appendix 9H – Botanical Survey.

9.2. Legislative and Planning Policy Context

9.2.1 The ecological impact assessment (EcIA) presented in this PEIR 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 the PEA report (Appendix 9A: Preliminary Ecological Appraisal Report (PEI Report Volume III).

Legislative Background

European Legislation

9.2.2 European Union and global biodiversity targets are partly delivered through a range of legislative measures, which place obligations on Member States to protect biodiversity and the natural environment. In relation to wildlife and nature conservation, two key Directives have been adopted by the European Union, namely:

- Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended) (Birds Directive); and
- Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).

9.2.3 These Directives provide for the protection of animal and plant species of European importance and the habitats which support them, particularly through the establishment of a network of protected sites, called Natura 2000.

9.2.4 Further relevant legislation includes Directive 92/43/EEC (Water Framework Directive), under which Member States are required to protect and improve their inland and coastal waters.

National Legislation

9.2.5 The following legislation is considered relevant to the Proposed Development:

- Wildlife and Countryside Act (WCA) 1981;
- Countryside and Rights of Way (CRoW) Act 2000;
- Natural Environment and Rural Communities (NERC) Act 2006;
- The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations);
- Protection of Badgers Act 1992;'
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD); and
- Animal Welfare Act 2006.

Planning Policy Context

National Planning Policy

9.2.6 The overarching National Policy Statement (NPS) for Energy (EN-1) (Ref 9-1) sets out national policy for energy infrastructure. Those parts of the NPS relevant to

biodiversity are detailed in Table 9.1**Error! Reference source not found.**, which includes cross references to where the issues have been addressed in the chapter.

Table 9.1: Summary of NPS Advice Relevant to Biodiversity

Summary of NPS	Consideration within the Chapter
Paragraph 5.3.3 states: *"Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity."*	Section 9.6
Paragraph 5.3.4 states: *"The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests."*	Sections 9.5 and 9.7
Paragraph 5.3.7 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 mitigation and consideration of reasonable alternatives (as set out in Section 4.4 above); where significant harm cannot be avoided, then appropriate compensation measures should be sought."*	Sections 9.5 and 9.7
Paragraph 5.3.18 states*: "The applicant should include appropriate mitigation measures as an integral part of the proposed development. In particular, the applicant should demonstrate that:* *during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;* *during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements;* *habitats will, where practicable, be restored after construction works have finished; and* *opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals."*	Sections 9.5 and 9.7

National Planning Policy Framework

9.2.7 The UK Government has committed to halting the overall decline in biodiversity. Planning requirements in support of this are specified in the National Planning Policy Framework (NPPF, Ref 9-2) published in July 2018.

9.2.8 The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. It specifies the obligations that Local Authorities and the UK Government have regarding

statutory designated sites and protected species under UK and international legislation, and how this is to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.

Local Planning Policy

9.2.9 Local planning policy relevant to ecology and nature conservation is set out in the North Lincolnshire Core Strategy (Ref 9-3, part of the North Lincolnshire Local Development Framework), which was adopted in June 2011 and sets out a long-term vision for managing growth and development in the area up to 2026. Policies CS5, CS16, CS17 relate to the protection of biodiversity resources, the maintenance of wildlife networks and green corridors, and ensuring ecological enhancement through good design.

9.2.10 The North Lincolnshire Core Strategy largely replaced the North Lincolnshire Local Plan, which was adopted in 2003. A new single Local Plan is in the process of being prepared by North Lincolnshire Council to replace the current North Lincolnshire Local Plan, the Core Strategy and the Housing and Employment Land Allocations Development Plan Documents (DPDs). The options are currently out to consultation, with the current timetable for the agreement and adoption of the new Local Plan by 2020. The consultation process has been supported by a Habitats Regulations Assessment document as part of the supporting evidence for the options appraisal stage (Ref 9-4).

Other Guidance

9.2.11 In July 2012, the UK Post-2010 Biodiversity Framework was published (Ref 9-5). This covers the period 2011 - 2020 and forms the UK Government's response to the UN Convention on Biological Diversity held in Nagoya in 2010. Following publication of the Framework, most of the strategic biodiversity work previously enacted under the UK Biodiversity Action Plan (Ref 19-6) was delegated to each of the four countries comprising the United Kingdom of Great Britain and Northern Ireland. The Framework shows how the work of the four UK countries joins up to achieve the international biodiversity targets agreed under the UN Convention, as well those required under the European Union biodiversity strategy.

9.2.12 In England, the strategic approach to be taken in biodiversity planning over the period 2010 to 2020 is set out in 'Biodiversity 2020, A strategy for England's wildlife and ecosystem services' (Ref 9-7). These country strategies replace the UK Biodiversity Action Plan, with the associated lists of priority habitats and species carried over into the newly defined lists of habitats and species of principal importance for nature conservation in England contained within Section 41 of the NERC Act. This latter list encompasses 56 habitats and 943 species.

9.2.13 The Local Biodiversity Action Plan (LBAP) for Lincolnshire (Ref 9-8) is a nature conservation strategy identifying threats to habitats and species within the county

and setting out the actions necessary to conserve them through a series of Habitat Action Plans (HAPs) and Species Action Plans (SAPs).

9.2.14 Standing advice has been published by Natural England and Defra to guide decision-makers on the determination of proposals with the potential to affect designated sites, species and habitats. The guidance sets out responsibilities and minimum requirements for survey and mitigation, including the need to engage with objectives for no net loss of biodiversity and provision of biodiversity net gain.

9.3. Assessment Methodology and Significance Criteria

Assessment Methodology

9.3.1 The EcIA detailed in this PEIR has been undertaken in accordance with best practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM) (Ref 9-9). The aims of the ecological impact assessment are to:

- Identify relevant ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted as a consequence of the Proposed Development;
- Provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development, which 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, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- Set out the steps to be taken to adhere to legal requirements relating to the relevant ecological features concerned.

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

- Ecological features 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;
- The importance of the identified ecological features is evaluated to place their relative biodiversity and nature conservation value into geographic context, and this is used to define the relevant ecological features that need to be considered further within the EcIA process;

- The changes or perturbations predicted to result as a consequence of the Proposed Development (i.e. the potential impacts), and which could potentially affect relevant ecological 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 taken into account;
- The likely effects (beneficial or adverse) on relevant ecological 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 features of nature conservation importance are also included;
- Any residual effects of the Proposed Development are reported; and
- Scope for ecological enhancement is considered.

9.3.3 It is not necessary in the assessment to address all habitats and species with potential to occur in the zone of influence of a proposed development. Instead, the focus should be on those that are 'relevant'. CIEEM guidance makes it 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'. 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.

9.3.4 To support focussed EcIA, there is a need to determine the scale at which the ecological features identified through the desk studies and field surveys undertaken for the Proposed Development are of value. The value of each ecological feature has been defined with reference to the geographical level at which it matters, and the results of this assessment have been used to identify the relevant features requiring impact assessment. The frames of reference used for this assessment, 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 ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (Lincolnshire/ Humberside);
- County (North Lincolnshire);
- District (East Lindsey);

- Local (ecological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and

- Negligible (common and widespread ecological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

9.3.5 All ecological features of Local value and above have been taken forward to impact assessment, and are the 'relevant ecological features' for the purposes of impact assessment.

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

- Impact – actions resulting in changes to an ecological feature. For example, demolition activities leading to the removal of a building utilised as a bat roost; and

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

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

- Beneficial/adverse (i.e. is the change likely to be in accordance with nature conservation objectives and policy):
  - Beneficial (i.e. positive) - a change that improves the quality of the environment, or halts or slows an existing decline in quality (e.g. increasing the extent of a habitat of conservation value); or
  - 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).

Significance Criteria

9.3.8 For each ecological feature only those characteristics relevant to understanding the ecological 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 ecological features, as follows:

- Not significant: No effect on structure and function, or conservation status; and

- Significant: Structure and function, or conservation status is affected.

9.3.9 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).

9.3.10 The CIEEM approach broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology of this PEI Report. However, the matrix has not been used to classify effects, as this deviates 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 this PEI Report as outlined in Table 9.2 below.

Table 9.2: Relating CIEEM Assessment Terms to those used in other PEIR Chapters

Effect classification terminology used in other PEIR 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 District or County level.
Non-significant	Minor beneficial	Beneficial effect on structure/function or conservation status at Site or Local level.
Non-significant	Neutral	No effect on structure/function or conservation status.
Non-significant	Minor adverse	Adverse effect on structure/function or conservation status at Site or Local level.

Effect classification terminology used in other PEIR chapters		Equivalent CIEEM assessment
Significant (adverse)	Moderate adverse	Adverse effect on structure/function or conservation status at District or County level.
	Major adverse	Adverse effect on structure/function or conservation status at Regional, National or International level.

Extent of Study Area

9.3.11 The study areas used in this assessment were defined with reference to the likely zone of influence over which the Proposed Development may have potential to result in significant effects on relevant ecological features.

9.3.12 It is important to recognise that the potential zone of influence of the Proposed Development may vary over time (e.g. the construction zone of influence may differ from the operational zone of influence) and/or depending on the individual sensitivities of different ecological features.

9.3.13 This was taken into account when defining study areas and these are sufficient to address the potential worst case zone of influence of the Proposed Development on the relevant ecological features concerned.

9.3.14 The extent of the study areas applied during the desk study and field surveys are detailed within Table 9.3 and Table 9.4 below, and in Figure 9A.2 (Phase 1 Habitat survey map) of Appendix 9A (PEI Report Volume III).

Sources of Information

9.3.15 The ecological baseline has been determined through a combination of desk study and field survey, as summarised below.

Desk Study

9.3.16 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 9.3 and is reported in detail in the Preliminary Ecological Appraisal (PEA) report in Appendix 9A (PEI Report Volume III).

9.3.17 Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the WCA, Schedules 2 and 4 of The Habitats Regulations, and species and habitats of principal importance for nature conservation in England listed under Section 41 (S41) of the NERC Act. Other notable habitats and species have also been considered and assessed on a case by case basis (e.g. those included in national Red Data Books and Lists and within the LBAP (Ref 9-8), but not protected by legislation). This is consistent with the requirements of relevant planning policy.

Table 9.3: Desk Study Area and Data Sources

Ecological Feature	Study Area[1]	Data Sources	Date Accessed
International statutory nature conservation designations (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site)	15km[2]	Multi-Agency Geographic Information for the Countryside (MAGIC) website	November 2017
National statutory nature conservation designations (e.g. Site of Special Scientific Interest (SSSI))	2km	MAGIC website Natural England website	November 2017
Local non-statutory nature conservation designations (e.g. Local Wildlife Sites (LWS))	1km	Greater Lincolnshire Nature Partnership	November 2017
Protected and notable habitats and species	1km	Greater Lincolnshire Nature Partnership	November 2017
Ponds	500m	1:25,000 Ordnance Survey maps Aerial photographs (Google Earth) MAGIC website	November 2017
Wintering birds	Fields to the east of Rosper Road	Able Marine Energy Park Development Consent Order – Environmental Statement (2012) Able UK Marsh Lane Car Storage Area – Ecological Survey reports (Planning ref: PA/2017/2141)	April 2018
Wintering birds	North Killingholme mudflats	British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS) for Sector J	April 2018

Field Surveys

9.3.18 The scope of habitat and protected species survey work considered necessary to inform the EcIA is summarised in Table 9.4. This was determined through a PEA of the Site, as detailed within Appendix 9A: PEA Report (PEI Report Volume III), which also includes the rationale applied when scoping out surveys for certain species or species groups.

9.3.19 The Phase 1 Habitat survey area encompassed all habitats within the Site, as well as land adjacent to the Site within the applicant's control. This included the

[1] See Figure 2 in Appendix 9A: Preliminary Ecological Appraisal (PEI Report Volume III)

[2] Study area for statutory designated sites was increased to 15km due to the requirement to consider air quality impacts

substantial area of brownfield land between the Site and Rosper Road. This was because at the time at which the Phase 1 Habitat survey was undertaken, the location of the Proposed Development within the land under the applicant's control was not defined. This has meant that much of the baseline survey information collected and presented within the PEA is outside the Site boundary, and is not directly relevant to the Proposed Development. This is clarified in the relevant baseline sections of this Chapter.

9.3.20 The southern section of the Site lies within the existing VPI Immingham CHP plant to facilitate the gas and electricity connections to the Proposed Development. These areas are entirely within the operational area of the VPI Immingham CHP plant and comprise only hardstanding and industrial infrastructure. Consequently, no ecology surveys were undertaken in these areas.

9.3.21 In addition to the surveys undertaken by AECOM, an initial walkover of the Site was undertaken in January 2017 by SLR Consulting (SLR) on behalf of the applicant (Ref 9-10), and SLR subsequently commissioned three months of wintering bird surveys undertaken by Graham Catley (Ref 9-11). As with the Phase 1 Habitat survey, the wintering bird survey area encompassed habitat within the Proposed Development boundary and the brownfield land between the Proposed Development and TLOR i.e. the land within the applicant's control.

Table 9.4: Scope and methods of ecological field survey work

Ecological Survey	Study Area[3]	Survey Method	Survey Period
Site walkover and preliminary appraisal	Habitats within and adjacent to the Site boundary	Preliminary appraisal undertaken in accordance with CIEEM 2016.	January 2017
Wintering bird survey	Habitats within and adjacent to the Site boundary.	Monthly walked transect surveys between January and March 2017	January – March 2017
Phase 1 Habitat survey	Habitats within the Site boundary and within 50m of the Site.	All habitats mapped in accordance with JNCC, 2010 (Ref 9-12)	September 2017 and March – May 2018.
Badger survey	Suitable habitat for badger within 100m of the Site, where accessible.	Search of study area for badger field signs including setts, footprints and latrines.	September 2017
Great crested newt survey	Ponds within 250m of the Site.	Habitat Suitability Index (HSI) appraisals of ponds in accordance with Oldham et al. 2000 (Ref 9-13). eDNA sampling undertaken in accordance with DEFRA guidance (Ref 9-14)	April 2018

[3] See Figure 3 in Appendix 9A: Preliminary Ecological Appraisal (PEI Report Volume III)

Ecological Survey	Study Area[3]	Survey Method	Survey Period
Reptile survey	Suitable habitat for reptiles within and adjacent to the Site.	Seven visits in suitable weather conditions using artificial refuges in accordance with standard guidance (Ref 9-15)	April – July 2018
Breeding bird survey	Suitable habitat for breeding birds within and adjacent to the Site.	Five walked transects covering all suitable potential nesting habitats based on standard guidance (Ref 9-16).	April – July 2018
Terrestrial invertebrate survey	All habitat within and adjacent to the Site boundary.	Three visits using various methods based on standard guidance (Ref 9-17).	May – July 2018
Botanical Survey	Habitat within and adjacent to the Site boundary	One visit in suitable weather conditions	15 June 2018

9.3.22 The following ecology surveys were scoped out on the basis of habitat unsuitability following completion of the PEA (further justification is provided in the PEA in Appendix 9A PEI Report Volume III):

- Further wintering bird surveys of the Site (SPA/ Ramsar species) - based on the habitat and topographical context of the Site, it is highly unlikely that the Site would have a specific value for passage and wintering birds associated with the Humber Estuary SPA/ Ramsar. This was confirmed by the wintering bird surveys carried out on the Site in 2017 (Appendix 9D, Volume 3); the only waterfowl species that were recorded were snipe (*Gallinago gallinago*) and woodcock (*Scolopax rusticola*), which do not form part of the SPA/ Ramsar assemblage;

- Wintering bird surveys outside the Site (SPA/ Ramsar species) – fields to the east of Rosper Road have been recorded to support wintering bird species including those for which the SPA/ Ramsar is designated and may therefore be considered to be 'functionally linked' to the SPA/ Ramsar. A review of survey data collected for a planning application on adjacent plots was used, along with monitoring survey data from the fields obtained from the British Trust for Ornithology's annual Wetland Birds Survey (WeBS);

- Bats (roosting) - there is no habitat suitable for roosting bats within or adjacent to the Site boundary;

- Bats (foraging/ commuting) - habitats within the Site boundary are sub-optimal habitat for foraging/ commuting bats, due to its close proximity to the existing VPI Immingham CHP Plant and the expected high levels of nocturnal light emissions in the local area that may deter foraging bats. The habitat on site is also relatively isolated from other suitable bat foraging habitats by the surrounding industrial sites, which includes the VPI Immingham CHP Plant to the south, and Lindsey Oil Refinery to the west and north; and

- White-clawed crayfish (*Austropotamobius pallipes*) – the desk study indicated that this species was not present in the county, and the adjacent field drainage ditch does not provide any suitable habitat for crayfish.

- Aquatic invertebrates – the seasonal nature of the shallow ephemeral waterbodies was concluded unlikely to support any rare or notable species. Surveys for this group of species were therefore not undertaken.

9.3.23 Surveys for the following species will be undertaken prior to construction to determine the requirement for specific construction mitigation:

- Water vole (*Arvicola amphibius*) – the adjacent drainage ditch had been identified as being potentially suitable for this species at the PEA stage. However, the majority of the ditch and its banks will not be directly impacted by the Proposed Development because the gas/ electricity connection to the existing VPI Immingham CHP plant will be via an overbridge pipe-rack. Further inspection of the ditch as part of the 2018 summer surveys found it to be steep-sided and heavily shaded by the bankside hedgerow. As the ditch is in a deep cutting at this location, the shading has resulted in there being no aquatic or marginal vegetation. In addition, the section of ditch adjacent to the Site is relatively isolated from the surrounding ditch network due to the extensive culverted sections at either end (beneath TLOR and Rosper Road, respectively). It is therefore considered that the ditch is of very low suitability for water vole. Potential impacts on water vole associated with the construction of the drainage outfall would be minor and temporary in nature, and will be managed through an appropriate mitigation strategy (either class-licensed Precautionary Working Method Statement or Natural England site-specific licence) if water vole is confirmed as present; and

- Otter (*Lutra lutra*) – the presence of this species on the adjacent ditch is likely to be on a highly occasional and transitory basis only, and therefore the risk of disturbance to the species if present on passage would be negligible. There is no suitable habitat for otter holts or couches (lying-up sites) and therefore there is no risk of the drainage outfall pipe affecting breeding or resting otter. Potential impacts on otter habitats associated with the construction of the drainage outfall would be minor and temporary in nature, and will be managed through appropriate Precautionary Working Method Statement (PWMS) if otter is confirmed as present.

Rochdale Envelope

9.3.24 For the purposes of the ecological impact assessment it is assumed that the majority of the Site 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 in particular its main structures, see Chapter 4: Proposed Development for further information) therefore do not alter the parameters of the assessment of construction (or decommissioning) impacts on ecology, as they are by definition worst-case.

9.3.25 For the assessment of air quality impacts during operation (and thereby the effects reported on ecological receptors in this chapter), the worst-case OCGT configuration

and stack height has been assessed. The assessment of operational impacts presented in this chapter is therefore also based upon a worst-case scenario for Rochdale Envelope parameters.

Limitations

9.3.26 While the Phase 1 Habitat survey was undertaken outside the optimal seasonal period for undertaking botanical surveys, and therefore some species may not have been readily identifiable, this gap was addressed through the undertaking of further botanical surveys in spring/ summer 2018 to establish a detailed botanical baseline for the Site for evaluation against Local Wildlife Site selection criteria. Therefore, for the purposes of scoping up further protected species surveys, the Phase 1 Habitat survey is considered sufficiently robust because an ecological scoping survey is not seasonally restricted.

9.4. Consultation

9.4.1 A precis of comments raised via the formal Scoping Opinion (Appendix 1B: Scoping Opinion in PEI Report Volume III) is summarised in Table 9.5 below.

Table 9.5. Consultation Summary

Consultee or organisation approached	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
Secretary of State (SoS)	Scoping Opinion July 2018	The Scoping Report proposes to scope out Great Crested Newt surveys at the settling pond for the Lindsey Oil Refinery, 250m from Site Boundary, because the levels of existing contamination making it unsuitable for this species. No information is provided regarding the level of contamination or the suitability of the habitat. Consequently, the Inspectorate has insufficient information to support scoping this waterbody out of the assessment.	

Consultee or organisation approached	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
Secretary of State (SoS)	Scoping Opinion July 2018	An assessment of effects on wintering birds is proposed to be scoped out of the assessment due to the unsuitability of the habitat on the site. The Scoping Report indicates that areas of the site have not yet undergone a Preliminary Ecological Appraisal and the baseline conditions in these areas have not been established. In addition, the Scoping Report does not appear to have considered the potential for indirect effects from the development pertaining to disturbance from noise or visual intrusion. Insufficient information has been provided therefore to support scoping this matter out of the assessment.	There is no suitable habitat for wintering birds on site. This is clarified in the PEA Report (see Section 9.12 in Appendix 9A PEI Report Volume III). Indirect impacts on wintering birds outside the site (in fields on the east side of Rosper Road) have been scoped into the impact assessment
		The Scoping Report indicates that areas of the site have not yet undergone a Preliminary Ecological Appraisal and the baseline conditions in these areas have not been established. The Inspectorate considers therefore that it cannot be concluded that no potential roosting habitat is present within the Site boundary, and on this basis cannot agree to scope this matter out of the assessment.	There is no suitable roosting habitat present within the Site boundary. This is clarified in the PEA Report (see Section 9.12 in Appendix 9A PEI Report Volume III).
		The Inspectorate notes that the habitat present within the main site is not optimal for bat foraging (due to the high levels of nocturnal light emissions from existing developments); however it is not clear that this remains applicable to the gas connection corridor. Therefore insufficient information has been provided to scope impacts on bat foraging and commuting out of the assessment.	The gas connection corridor provides sub-optimal habitat for foraging bats (see Section 9.12 in Appendix 9A (PEI Report Volume 3).

Consultee or organisation approached	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
Secretary of State (SoS)	Scoping Opinion July 2018	The Scoping Report identifies a number of drains adjacent to the Proposed Development that may provide suitable habitat for water vole, known to be present in the wider area. Therefore the Inspectorate considers there is insufficient justification provided in the Scoping Report to support a decision to scope out the need for water vole surveys.	The ditch immediately adjacent to the Proposed Development is of low suitability for water vole (see Sections 9.12 Appendix 9A (PEI Report Volume III)). There are no other ditches or drains relevant to the Proposed Development.
		The Scoping Report defines a study area of 10km from the Proposed Development for SPAs, SACs and Ramsar sites, and 2km for SSSI's "based on the anticipated emissions associated with the development and their likely extent". The Inspectorate notes the Environment Agency's guidance on "Air emission risk assessment for your environmental permit" states that some larger (greater than 50 MW) emitters may be required to screen to 15km for European sites and 10 to 15km for SSSIs. The Inspectorate therefore recommends that the ES contains a robust justification to support the selected study area relevant to the designated ecological sites, with reference to relevant guidance, the extent of the likely impacts, and any agreement reached with relevant consultation bodies.	A 15 km desk study radius has been considered for statutory designated sites in the air quality impact assessment (see Chapter 6: Air Quality).
		The Inspectorate considers that in addition to local, national and international nature conservation designations, the assessment should also consider Sites of Importance for Nature Conservation (SINC), geological sites, the likely impact on the geodiversity interests of such sites, as well as the local Biodiversity Action Plan (BAP).	The SINC designation has been superseded by the LWS designation for locally designated sites in the Greater Lincolnshire region. The local BAP has been referred to where relevant (see Appendix 9A, PEI Report Volume III).

Consultee or organisation approached	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
Secretary of State (SoS	Scoping Opinion July 2018	The ES should clearly distinguish between the measures that are presented as mitigation in response to identified significant effects, and those enhancement measures which the applicant has identified in addition to the necessary mitigation measures. Mitigation measures including any plans should be sufficiently developed and secured in order to provide confidence in the assessment conclusions in the ES.	Mitigation and enhancement are described in Section 9.7
		No surveys for aquatic invertebrates are proposed. The ES should undertake sufficient surveys to establish presence/absence of aquatic invertebrate species where significant effects are likely to occur.	The ponds on site that will be lost are seasonal areas of inundation that dry out annually in early spring. They are therefore of limited value to aquatic invertebrates, and no surveys were considered necessary (because there is no potential for significant effects) (see Section 9.12 in Appendix 9A, PEI Report Volume III).

9.5. Baseline Conditions

Existing Baseline

9.5.1 The ecological baseline relevant to the Proposed Development is summarised below. Further details of the findings of desk and field based studies, including evaluation of the relative nature conservation value of identified ecological features, are provided in the appendices (PEI Report Volume III).

Statutory International Nature Conservation Designations within 15km

9.5.2 The Humber Estuary European Marine Site (EMS) is approximately 1.4 km north-east of the Site. The Humber Estuary EMS is designated as a Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site because of its estuarine and intertidal habitats that support internationally important populations of wintering birds (especially geese, ducks and waders) during the migration periods and in winter. In summer, the Humber Estuary supports important breeding populations of bittern (*Botaurus stellaris*), marsh harrier (*Circus aeruginosus*), avocet (*Recurvirostra avosetta*) and little tern (*Sterna albifrons*). The marine species sea lamprey (*Petromyzon marinus*), river lamprey (*Lampetra fluviatilis*) and grey seal (*Halichoerus grypus*) are also designated features of the SAC.

9.5.3 There are no other international nature conservation designations within a 15km radius of the Site, which is the worst-case zone of influence defined in Table 9.3.

This search radius is sufficient to identify all designations relevant to the assessment of potential air quality impacts.

9.5.4 A signposting report to inform Habitats Regulations Assessment (HRA) screening of the Proposed Development is presented as Appendix 9B (PEI Report Volume III).

Statutory National Nature Conservation Designations within 15km

9.5.5 The Humber Estuary is also designated as a Site of Special Scientific Interest (SSSI), the boundary of which largely overlaps with the SPA, SAC and Ramsar designated site boundaries.

9.5.6 The North Killingholme Haven Pits SSSI, an important high tide roost for wading birds feeding in the Estuary, is approximately 2 km north of the Site.

9.5.7 Two other potentially relevant SSSIs are located within the study area; Swallow Wold SSSI, which is approximately 13 km south of the Site, and Wrawby Moor, which is approximately 15 km south-west of the Site.

9.5.8 Two geological SSSIs were identified within the study area; Kirmington Pits SSSI (approximately 9 km north of the Site) and Kelsey Hill Gravel Pits SSSIs (approximately 11 km north-east of the Site). These SSSIs have been discounted from the ecological impact assessment on the basis that they are not relevant ecological features.

Non-statutory Nature Conservation Designations within 1km

9.5.9 Three non-statutory designations (Local Wildlife Sites (LWSs)) are located within 1km of the Site, as listed below. These are all of County nature conservation value:

- Burkinshaw's Covert LWS – 0.4 km north, comprises woodland and seasonally wet areas;
- Station Road Field LWS – 0.4 km north, predominantly grassland site with some botanical interest and a small area of wetland that supports farmland birds. Ponds on Site supported a GCN population in 2006; and
- Rosper Road Pools LWS – 0.3 km south-east, an artificial flood relief reservoir (now largely overgrown with reeds) designated as supporting breeding, wintering and migrant birds and water vole.

Habitats

9.5.10 The habitats associated with the Proposed Development are summarised below. Full results of the Phase 1 Habitat survey, including a Phase 1 habitat map, are provided in the PEA report (Appendix 9A, PEI Report Volume III). The Proposed Development is set in a landscape dominated by the industrial areas of The Total Lindsey Oil Refinery (TLOR) and the existing VPI Immingham CHP plant, which are to the west and south of the main OCGT Power Station Site respectively. The habitats are described in two areas of the Proposed Development as follows:

- Main OCGT Power Station Site. This is the area to be occupied by the main OCGT power station, and covers approximately 5.79ha of brownfield land between the TLOR car park to the north, Rosper Road to the east and the unnamed drainage ditch to the south; and

- New Gas Pipeline Link[4], Above Ground Installation (AGI) and Construction Laydown Areas. This includes the areas surrounding the existing VPI Immingham CHP plant that are proposed for access roads, temporary construction laydown areas, a new AGI and gas pipeline connection to VPI Immingham CHP plant to power the new OCGT, and is approximately 10 ha in total at this stage of the project development, as two potential options are under consideration.

9.5.11 At the time of the site visit, the main OCGT Power Station Site was dominated by a mosaic of semi-improved neutral grassland and dense scrub that had colonised the previously disturbed ground used for the storage of material cleared from the relatively recently constructed TLOR car park, which lies to the immediate north. Consequently the habitat is undulating with vegetated mounds of rubble/ spoil. The grassland was typified by a rank unmanaged grass dominated sward with locally abundant tufted hair-grass (*Deschampsia cespitosa*) indicating where ground is drainage impeded during the winter. The grassland was species poor and forb species included locally frequent teasel (*Dipsacus fullonum*), colt's-foot and creeping thistle (*Cirsium arvense*), with occasional fleabane (*Pulicaria dysenterica*) and rare wild carrot (*Daucus carota*).

9.5.12 Scattered willow (*Salix* spp.) and bramble (*Rubus fruticosus* agg.) dominated scrub was also present, mainly associated with the tall herb areas. A substantial area of bramble scrub had been previously cleared in the southern part of the Site, resulting in a large area of bare ground.

9.5.13 There were four standing water bodies within the Proposed Development boundary (Ponds 1, 2, 4 and 5). Ponds 1 and 2 were seasonal ponded areas adjacent to Rosper Road, in the brownfield land to the east of the Site. These ponds supported vegetation that indicated they held water for much of the year, although the spring

[4] This is not the gas pipeline route under previous consideration that was included within the SORL, as this has since been deleted from the Proposed Development.

and summer surveys confirmed that they dried out completely by around late May/ early June. Pond 1 supported a high emergent cover of common spike rush (*Eleocharis sp*.) with frequent bulrush (*Typha latifolia*) and rare grey club-rush (*Schoenoplectus tabernaemontani*) whereas Pond 2 was dominated by bulrush. Following a site visit in February 2018, it appeared that the separate 'ponds' identified in early autumn and reported in the PEA combine to form a large area of shallow ponded water throughout the winter and early spring months, covering most of the eastern part of this area where drainage is impeded.

9.5.14 Pond 4 was a seasonal ponded area that had developed on an area of impeded drainage in the central portion of the brownfield land between the Site and Rosper Road. Pond 5 has developed in an abandoned archaeological trial trench in this area, immediately east of the Site. These pools supported no aquatic or marginal vegetation, and were found to be dry by early summer.

9.5.15 There were two other water bodies (ponds) within 250 m of the Site (both to the west of the Site); Ponds 3 and 6. Pond 3 was a large drainage lagoon located to the west of the Site. This is part of the TLOR process facility, and as such has been scoped out of further surveys. Pond 6 had developed in a shallow archaeological trial trench (50m x 2m) that was excavated as part of previous ground investigations on the land. The pond supported no aquatic or marginal vegetation and was turbid.

9.5.16 A substantial drainage ditch runs along the southern edge of the main OCGT power station area (between the main OCGT Power Station Site and the existing VPI Immingham CHP plant to the south), and drains surface water from within TLOR. An outfall into the ditch from the TLOR is present to the west of the Site. A surface water drainage ditch is also present alongside Rosper Road along the eastern boundary of the main OCGT Power Station Site, but was found to be entirely dry at the time of the survey and does not appear to regularly hold water.

9.5.17 The habitat assemblage within the main OCGT Power Station Site is considered to represent an example of the Open Mosaic Habitats (OMH) on Previously Developed Land S41 priority habitat type. OMH is not a discrete habitat that can be mapped for the purposes of Phase 1 Habitat survey, but instead is a matrix derived from a variety of different habitat types and associated habitat and land-use features and characteristics, and edaphic conditions. A detailed botanical survey of the OMH was undertaken in summer 2018, and confirmed that the habitat did not met the criteria for county LWS selection (Appendix 9H: Botanical Survey, PEI Report Volume III). This habitat is therefore evaluated as being of district nature conservation value.

9.5.18 Habitats within the VPI Immingham CHP plant area (within the red line boundary) 'wrap around' the existing plant, which lies to the south of the main OCGT Power Station Site. The majority of the habitats surveyed in this area appeared to have been relatively recently disturbed and were thus of negligible botanical interest. None of the habitats within this area were considered to meet the criteria for classification as OMH priority habitat.

Protected and Notable Species

9.5.19 No protected, rare or notable plant species were identified within the Proposed Development during the Phase 1 Habitat surveys. No invasive, non-native plant species were identified within or directly adjacent to the Proposed Development during the Phase 1 habitat survey or the subsequent botanical survey.

9.5.20 The following protected and notable faunal species were identified in the PEA either as present in association with the Site, or potentially within the zone of influence of the Proposed Development:

- Wintering birds (on Site and in adjacent habitats);
- Breeding birds;
- Great crested newt;
- Reptiles;
- Otter;
- Water vole;
- Terrestrial invertebrates;
- Brown hare; and
- Badger.

Wintering Birds (Site)

9.5.21 Baseline information on wintering birds is presented in Appendix 9D in PEI Report Volume III.

9.5.22 The wintering bird survey of the Main OCGT Power Station Site and the brownfield land to the west (between the Main OCGT Power Station Site and TLOR) recorded only common wintering passerine species. The only waterfowl species that were recorded were snipe (*Gallinago gallinago*) and woodcock (*Scolopax rusticola*), which do not form part of the Humber Estuary SPA/ Ramsar assemblage.

9.5.23 The undulating topography and tall vegetation within the Main OCGT Power Station Site means that it is unsuitable to support aggregations of feeding and roosting/ loafing waders at high tide because there is insufficient 'scanning distance'. Flocks of waders and wildfowl prefer open and shorter-swarded habitat over which they can easily identify and thus escape from predators such as foxes and birds of prey.

9.5.24 There is no suitable habitat for wintering birds in the existing VPI Immingham CHP plant area because it is dominated by the existing operational site, and semi-natural habitat is limited to small strips around the edge of the site. These areas are too small to attract aggregations of passage and overwintering SPA/ Ramsar birds.

9.5.25 The Proposed Development is evaluated to be of negligible ecological value to wintering birds, and this ecological feature is not considered further in this assessment.

Wintering Birds (Rosper Road Fields)

9.5.26 The Proposed Development has the potential to have noise and visual impacts beyond the immediate Site boundary during construction, operation and decommissioning. The fields on the east side of Rosper Road to the Proposed Development (between Rosper Road and the Humber Estuary) have been subject to previous surveys to record wintering and passage waterbirds, because they provide high tide feeding, roosting and loafing habitat for waterbirds that are part of the Humber Estuary SPA/ Ramsar assemblage. These fields can therefore be considered to be 'functionally linked' to the SPA/ Ramsar[5] and within the potential zone of influence of the Proposed Development.

9.5.27 No specific surveys of the Rosper Road fields have been undertaken by AECOM to inform this EcIA. This is because there is a large amount of wintering bird data for the fields from previous surveys, including those undertaken as part of the DCO application for the consented Able Marine Energy Park (AMEP), and annual counts undertaken as part of the BTO WeBS. More recently, a wintering bird desk study exercise was completed by SLR Consulting as part of a planning application for a car storage area off Marsh Lane for Able UK (Ref 9-18; Planning Ref: PA/2017/2141).

9.5.28 The fields immediately east of the Proposed Development are within the boundary of the consented AMEP DCO. These fields have been found to support numbers of feeding curlew in excess of 1% of the five year peak mean Humber Estuary population (this being the threshold for indicating higher value areas around the Estuary), but habitat suitability is influenced by horse grazing and agricultural activities (Ref 9-18). Compensation for the loss of these fields was agreed with North Lincolnshire Council and Natural England to be provided at North Killingholme Marshes ('AMEP Mitigation Area A'), in fields east of Rosper Road to the south and east of the Proposed Development. This forms part of the South Humber Gateway (SHG) mitigation strategy that has been adopted in the Local Plan, which will deliver 80 ha of wet grassland (in four 20 ha blocks) with 150 m surrounding 'buffers' to facilitate HRA compliant development on coastal fields in the South Humber Gateway region.

9.5.29 The proposed Marsh Lane car storage area (Planning Ref: PA/2017/2141) would occupy fields to the south-east of the Site (on the eastern side of Rosper Road), which are currently within the consented AMEP Mitigation Area A. These fields were consented for the creation and management of wet grassland primarily for curlew, to be delivered as compensation for the AMEP development. Since the

[5] Field reference numbers used in this assessment adopt the Humber EDC numbering system for consistency

AMEP DCO was made, a subsequent planning application has been submitted by Able UK to North Lincolnshire Council to relocate Mitigation Area A to the 'Halton Marshes Wet Grassland Scheme (HMWGS)' on the north side of the AMEP development at East Halton Skitter. The HMWGS would deliver a single, larger area of wet grassland (with appropriate buffers) to compensate for the loss of high tide functional habitat in the Rosper Road fields resulting from the AMEP and Able Logistics Park (ALP) consented developments. However, this application has yet to be determined by North Lincolnshire Council, and therefore there remains uncertainty as to where the mitigation areas for the AMEP DCO (consented) and the Marsh Lane car storage area (not consented to date) will be delivered. No reliance has therefore been placed on the delivery of the HMWGS when undertaking this assessment.

9.5.30 The undeveloped arable/ pasture fields between Rosper Road and the Humber Estuary are evaluated as being of County importance to nature conservation, given that they support numbers of curlew in excess of the 1% threshold[6] (of the Humber Estuary population) that are part of the Humber Estuary SPA/ Ramsar/ SSSI.

Wintering Birds (North Killingholme mudflats)

9.5.31 WeBS data obtained for the nearest count sector of the Humber Estuary SPA/ Ramsar site (Sector J) indicated that the mudflats at North Killingholme supported internationally important aggregates of black-tailed godwit (*Limosa limosa*), with numbers typically peaking in August/ September on autumn passage, and in November for the wintering period. The nearest part of the intertidal mudflats on which this species feeds is approximately 1.3 km north-east of the Site. The black-tailed godwit flocks typically roost at high tide in the North Killingholme Haven Pits SSSI, which is approximately 1.9 km north of the Site.

9.5.32 The wintering bird assemblage of North Killingholme mudflats is therefore evaluated as being of International nature conservation value.

Breeding Birds

9.5.33 Breeding bird surveys were completed in spring and summer 2018 (see Appendix 9E: Breeding Birds, PEI Report Volume III).

9.5.34 A total of 22 bird species were recorded within the Proposed Development site, of which 15 species were considered to be probably/ possibly breeding (single territories recorded for each species). Three of these species were S41 Species of Principal Importance: dunnock (*Prunella modularis*), linnet (*Linaria cannabina*) and reed bunting (*Emberiza schoeniclus*). Linnet is also Red List species, and dunnock and reed bunting are also Amber List species. The remaining species were Green List species: blackbird (*Turdus merula*), blackcap (*Sylvia atricapilla*), carrion crow

[6] The 1% threshold is used as a means of identifying 'areas' supporting aggregations of SPA/ Ramsar birds that are considered a notable proportion of the whole Estuary populations(s).

(*Corvus corone*), chaffinch (*Fringilla coelebs*), goldfinch (*Carduelis carduelis*), great tit (*Parus major*), robin (*Erithacus rubecula*), lesser whitethroat (*Sylvia currucla*), wren (*Troglodytes troglodytes*), whitethroat (*Sylvia communis*), red-legged partridge (*Alectoris rufa*) and magpie (*Pica pica*).

9.5.35 These are all common and widespread species, and with the exception of dunnock, reed bunting and linnet breeding numbers are not recorded to be declining in the UK. The small number of birds and limited diversity of species recorded reflected the relatively small size of the Proposed Development site. Habitats within the Proposed Development site also offered relatively limited breeding opportunities, with large areas of bare/ recently cleared ground. Breeding records were largely confined to the scattered areas of scrub, with reed bunting recorded in the wetland area in the east of the Site (associated with Ponds 1 and 2), and the ground nesting species red-legged partridge nesting in the tall grassed sward area towards the centre of the Main OCGT Power Station Site.

9.5.36 The breeding bird assemblage supported by the Proposed Development area is evaluated to be of negligible nature conservation value, and has not been taken forward for ecological impact assessment.

Great Crested Newt

9.5.37 Further details on the GCN survey and pond habitat suitability appraisal are provided in Appendix 9C: Great Crested Newt Survey (PEI Report Volume III):. The pond locations are shown in Figure 3 of Appendix 9A: Preliminary Ecological Appraisal (PEI Report Volume III).

9.5.38 GCN surveys undertaken for the consented AMEP development recorded a medium sized GCN population in two ponds in a field off Station Road ('Pond 12' at TA 167 181 and 'Pond 13' at TA 168 182) (Ref 9-19). These ponds were 0.6 km and 0.7 km north of the Site respectively. A GCN mitigation licence was obtained for the AMEP development (Natural England licence number: 2014-1559-EPS-MIT), which included for the capture and translocation of GCN to a new receptor area comprising six new ponds at 'Mitigation Area B'. This is a small triangular portion of land off Rosper Road adjacent to Chase Hill Wood, approximately 1.5 km north of the Site. The original GCN ponds have been subsequently lost to the AMEP development, translocation of GCN completed and the compensation habitat delivered at Mitigation Area B. However, this information indicated that populations of GCN are known in the wider local area.

9.5.39 Four water bodies were present within the Site boundary (Ponds 1, 2, 4 and 6), and two were identified within 250 m of the Site boundary (Ponds 3 and 6). Of these, Ponds 1 and 2 were subject to an environmental DNA (eDNA) survey in spring 2016 by SLR for the Marsh Lane car storage application (Ref 9-28), which returned a

negative result for GCN[7]. Ponds 4, 5 and 6 were subject to eDNA sampling by AECOM in April 2018, and samples were also taken from Ponds 1 and 2 to update the 2016 survey. The results are given in Table 9-6 below.

9.5.40 Pond 3 is a square water storage lagoon, which is linked to the process facility of TLOR (it is a settling pond for contaminated run-off), and as such is contaminated and thus unsuitable for GCN. This pond was therefore scoped out of further surveys for GCN and was not subject to eDNA sampling.

9.5.41 The eDNA samples were taken by a licensed AECOM ecologist on 16th April 2018, and all samples returned a negative result for GCN. No further consideration is therefore given to GCN in this assessment.

Table 9.6. GCN eDNA Survey Results

Pond Reference	Pond Type	Grid Reference	Distance from Site	HSI Score	eDNA Sampling Result
1	Flooded part of site	TA 167 175	Within Site boundary	Excellent	Negative
2	Flooded part of site	TA 168 174	Within Site boundary	Good	Negative
3	TLOR process lagoon	TA 164 173	70m west	Not surveyed as unsuitable for GCN	
4	Flooded part of the site	TA 166 174	Within Site boundary	Average	Negative
5	Flooded archaeology trial trench	TA 166 174	Within Site boundary	Below average	Negative
6	Flooded archaeology trial trench	TA 165 173	30 m west	Poor	Negative

Reptiles

9.5.42 The habitats within the Site boundary were appraised as being of potential suitability for grass snake (*Natrix natrix*) and common lizard (*Zootoca vivipara*) in the PEA. However, presence/ absence surveys undertaken in spring and summer 2018 did not record any reptiles. Survey results are presented in Appendix 9G: Reptile Survey (PEI Report Volume IIII). On this basis, no further consideration is given to reptiles in this assessment.

[7] N.B. Only one waterbody (P3) is referred to in the SLR report; however the nature of the wetland means that it is difficult to distinguish between specific 'ponds' because the whole area holds standing water.

Otter

9.5.43 The surface water drainage ditch to the south of the Site was heavily shaded and provided poor quality foraging habitat for otter. Given that this species is known to be present in the wider area and Humber Estuary, its occasional presence on passage cannot be ruled out, although the ditch was poorly connected to the wider ditch network and Humber Estuary due to extensive culverting. Passage otter is evaluated as being of negligible nature conservation value, and is not considered further in this assessment.

9.5.44 Legal requirements in respect of this species are considered in the Mitigation section of this Chapter.

Water Vole

9.5.45 The surface water drainage ditch to the south of the Site was heavily shaded, supports virtually no aquatic or marginal plant species and provides poor quality habitat for water vole. The ditch is poorly connected to the wider ditch network, and is a rather isolated stretch located between extensive culverted sections beneath TLOR and Rosper Road respectively. However, given that this species is known to be present on ditches in the wider local area, it may be present on occasion and cannot be ruled out. As discussed above, given the limited potential for impacts on the ditch as a result of the Proposed Development, detailed surveys for the species were scoped out. For the purposes of impact assessment it has been assumed that a water vole population of Local nature conservation value is present in association with the ditch.

9.5.46 Legal requirements in respect of this species are considered in the Mitigation section of this Chapter.

Terrestrial Invertebrates

9.5.47 Ten 'key species' were recorded within the Proposed Development area. These were species listed on the NERC Act S41, Red Data Book (RDB), or those whose conservation status was listed as Nationally Rare, Notable, Threatened or Near Threatened. The key species are listed in Table 9.7. Survey results are presented in Appendix 9F: Terrestrial Invertebrates (PEI Report Volume III).

9.5.48 The terrestrial invertebrate assemblage was assessed as being of County value to nature conservation.

Table 9.7: Key species of Terrestrial Invertebrates Recorded

Order	Family	Species (Scientific Name)	Species (Common Name)	Status
Aranae	Thomsidae	*Xysticus sabulosus*	A crab spider	Nationally scarce (NS)
Coleoptera	Carabidae	*Brachinus crepitans*	A bombardier beetle	NS
Coleoptera	Oedermeridae	*Oedemera viriscens*	A false blister beetle	Nationally Rare

Order	Family	Species (Scientific Name)	Species (Common Name)	Status
				(NR)
Diptera	Dolichpodidae	*Dolichopus migrans*	A dolichopid fly	NR, Vulnerable (VU)
Diptera	Dolichpodidae	*Dolichopus agilis*	A dolichopid fly	NR, VU
Hymenoptera	Nomada	*Nomad fulvicornis*	Fork-jawed nomad bee	RDB3
Hymenoptera	Pompliidae	*Priocnemis schioedtei*	A spider hunting wasp	Nationally Notable (Nb)
Lepidoptera	Erebidae	*Tyria jacobaea*	Cinnabar	S41 (Research only)
Lepidoptera	Lasiocampidae	*Malalacosoma Neustria*	The Lackey	S41 (Research only)
Mollusca	Hygromiidae	*Curnuella virgata*	Vineyard snail	Data Deficient (DD)

Brown Hare

9.5.49 No brown hares (*Lepus europaeus*) were observed on the Site during the course of other ecological surveys. The arable habitats on the east side of Rosper Road do provide suitable habitat for this species, although there were no records of the species in ecology survey reports for the AMEP development (consented) or the Able UK car storage area off Marsh Lane (currently in consultation phase). The habitat within the Site boundary provides limited opportunities for brown hare breeding, with much of the site being marshy/ wet due to impeded grassland. The Site is also relatively isolated within the surrounding industrial area including TLOR to the west and the VPI Immingham CHP plant to the south. On this basis, it is reasonable to assume that brown hare is not resident within the Site boundary, and it is not considered further in this assessment.

Badger

9.5.50 No evidence of badger (*Meles meles*) was identified within the Site boundary. The Site is entirely surrounded by industrial areas associated with TLOR to the north and west, and the VPI Immingham CHP plant to the south, as well as Rosper Road to the east. It is therefore highly unlikely that the species forages on the Site. This species is assumed to be absent from the Site and is therefore not considered further in this assessment.

Summary of Baseline

9.5.51 A summary of the baseline ecology conditions at the Site is provided in Table 9.7 below. As discussed in the methods section, all ecology features valued at local level or above and with the potential to be affected have been taken forward for impact assessment.

Table 9.7. Summary of Baseline Ecology Features

Ecology Feature	Nature Conservation Value	Justification	Taken forward for Assessment?
Humber Estuary SAC/ SPA/ Ramsar/ SSSI	International	Site supports qualifying features under the relevant EC Directives that are of international importance.	Yes – potential for direct and indirect effects on habitats and qualifying features
Burkinshaw's Covert LWS	County	Site meets the criteria for habitats/ features of county importance.	Yes – potential for direct effects on habitats
Station Road Field LWS	County	Site meets the criteria for habitats/ features of county importance.	Yes – potential for direct effects on habitats
Rosper Road Pools LWS	County	Site meets the criteria for habitats/ features of county importance.	Yes – potential for direct effects on habitats
Open Mosaic Habitats on Previously Developed Land (OMH)	District	Habitat does not meet the Lincolnshire LWS selection criteria but is considered to be an example of NERC Act S41 open mosaic priority habitat.	Yes – habitats will be lost to Proposed Development
Ponds	Negligible	The ephemeral waterbodies are seasonal in nature and do not support any protected species of amphibians. They dry out in the summer months, and are in the process of natural succession to permanently dry grassland habitats.	No
Wintering birds (within Proposed Development Boundary)	Negligible	Habitats on site are unsuitable for important aggregations of wintering/ passage birds including those that are the qualifying features of the Humber Estuary SPA/ Ramsar wintering assemblage.	No
Wintering birds (in fields to the East of Rosper Road)	County	Fields support aggregations of wintering birds in excess of 1% of the Humber Estuary SPA/ Ramsar populations	Yes – potential for noise and visual disturbance

Ecology Feature	Nature Conservation Value	Justification	Taken forward for Assessment?
Breeding birds	Negligible	Although surveys are yet to be complete, it is considered unlikely that the habitats present on the site will support anything other than common and widespread breeding bird species.	No
GCN	-	Absent	No
Otter	Negligible	May be present on an occasional and transitory basis in the surface water drainage ditch to the south, but this is not well connected to the surrounding ditch network (and Estuary) due to culverting.	No
Water vole	Local	May be present on drainage ditch but habitat is of poor quality for water vole.	Yes – potential for direct and indirect effects on habitats
Reptiles		Absent	No
Terrestrial invertebrates	County	Ten key species recorded.	Yes – habitats will be lost to Proposed Development. Considered as part of impact assessment on OMH.
Brown hare	-	Absent	No
Badger	-	Absent	No

Future Baseline

No Development (2022)

9.5.52 It is reasonable to assume that over this timeframe, and in the absence of habitat management, the open rank grassland areas will have naturally shifted to a more scrub dominant habitat as the willow continues to establish.

9.5.53 The swamp/ ephemeral pooled areas would be expected to become drier as a result of the accumulation and establishment of emergent/ aquatic plants and the subsequent natural succession of the wetland habitats to grassland. However, over the short timescales considered as part of the future baseline, it is reasonable to conclude that there would not be any substantive changes in the extent of standing water on the Site, or their value to species.

9.6. Development Design and Impact Avoidance

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

9.6.2 The development design and impact avoidance measures have been, or would be, adopted during the construction, operation and decommissioning phases of the Proposed Development. These are set out below.

Construction

9.6.3 The construction phase of the Proposed Development will comply with industry good practice and environmental protection legislation during construction in relation to prevention of surface and ground water pollution, fugitive dust management and noise prevention or amelioration. In support of this, the construction contractor would prepare and implement a Construction Environmental Management Plan (CEMP) detailing all requirements for environmental protection and legal compliance.

9.6.4 To ensure legislative compliance in relation to nesting birds, all clearance of suitable vegetation during site preparation would be undertaken outside the breeding season (typically March-August inclusive for most species), where possible. In situations where this is not possible, an ecologist would check the working area for nests before works commence. If nests were discovered, appropriate mitigation would be implemented to ensure that they are not disturbed or destroyed before any works can commence in that area. This would include imposing exclusion zones between the works and nest(s) and suspending vegetation clearance works within the area until any young had fledged.

9.6.5 Precautionary measures would be implemented to prevent trapping wildlife in construction excavations, in order to ensure compliance with animal welfare legislation. Any excavations deeper than 1m 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 allow animals (e.g. otter) to vacate excavations should they fall in.

9.6.6 Construction temporary lighting would be arranged so that glare is minimised outside the construction site. Measures to minimise the impact of lighting will be detailed in the CEMP.

9.6.7 The drainage network for the Proposed Development will likely require the construction of an outfall pipe (and associated headwall structure) into the drainage ditch to the south of the Proposed Development. A precautionary pre-construction survey of the ditch for water vole and otter will therefore be undertaken at least 3 months prior to the commencement of works to determine whether specific mitigation for this species is required. In the event that water vole presence is confirmed, mitigation will include displacement of the species from the small area to

be affected. It is considered likely that given the minor impacts of the work, this work can proceed under the supervision of a water vole Class Licensed ecologist rather than requiring a site-specific Natural England licence. A Precautionary Working Method Statement (PWMS) would be prepared prior to the commencement of works.

Operation

9.6.8 Lighting impacts beyond the Site boundary would be minimised as far as possible, for example by directing lighting away from adjacent habitats, in accordance with the lighting design for the scheme.

9.6.9 Air impacts on designated sites will be minimised through the use of appropriate stack heights to aid dispersion of pollutants and emissions monitoring to demonstrate continued compliance with emission limit values set by the Environment Agency.

9.6.10 Surface water discharge would be attenuated to green-field run-off rates and therefore there would be no changes in the flow rate within the adjacent drainage ditch. There is therefore no potential for adverse operational effects on the ditch habitats and the species it may support (otter and water vole).

Decommissioning

9.6.11 Further site surveys would be undertaken in advance of decommissioning works, to determine the status of protected species and to evaluate the habitats present that may be impacted. Relevant avoidance and mitigation measures would be specified and implemented with reference to the findings of the above surveys.

9.6.12 The following measures would be implemented as appropriate:

- Survey findings and associated mitigation requirements would be discussed and agreed with stakeholders as required prior to the start of works;
- Relevant stand-off working distances would be identified by the project ecologist and implemented to avoid effects, where practicable;
- All necessary protected species licences would be obtained to derogate unavoidable impacts on relevant protected species. Mitigation and monitoring would be implemented in accordance with the requirements of the relevant licences;
- Works would be planned to avoid key risk periods (seasons) where appropriate and practicable; and
- Relevant works would be undertaken under the supervision of an Ecological Clerk of Works to deliver compliance with relevant legislation and approved mitigation.

9.7. Likely Impacts and Effects

Construction

9.7.1 This section describes the impacts and potential effects during the construction phase of the Proposed Development on relevant ecological features in the absence of any mitigation, over and above that which is inherent to the design and can therefore be considered 'embedded mitigation'.

9.7.2 To enable a focussed impact assessment, screening was undertaken of potential impacts of the construction phase that are likely to result in adverse or beneficial effects on relevant ecological features and that require further impact assessment. The relevant impacts are taken forward in the more detailed impact assessment that follows. Those impacts that are considered unlikely to result in effects are scoped out and not considered further.

9.7.3 The following broad categories of impact and their potential effects on ecological features were used for the purposes of the screening exercise:

- Habitat loss - clearance or damage of habitat to facilitate construction, resulting in temporary or permanent reduction in habitat extent and potential direct and indirect effects on associated species; and

- Disturbance - increased levels of disturbance (noise, vibration, lighting), potentially resulting in adverse effects on protected and notable species.

9.7.4 The following potential source-receptor pathways have been screened out of the impact assessment in respect of the Humber Estuary designated site:

- Noise/ visual disturbance to qualifying breeding bird species (bittern, marsh harrier, avocet and little tern) - there is no suitable habitat for the qualifying species of breeding birds within the potential zone of influence of noise and visual disturbance arising from the construction of the Proposed Development. There is therefore no pathway by which these features could be affected by the Proposed Development;

- Noise/ visual disturbance to qualifying wintering bird species feeding on mudflats within the Humber Estuary SPA/ Ramsar – the nearest mudflats are approximately 1.3 km away from the Proposed Development, and at this distance any construction noise would reasonably attenuate to within ambient levels. Visual impacts would also not occur given the distances involved; and

- Air quality impacts on intertidal and subtidal habitats – intertidal habitats are not susceptible to the effects of changes in air quality arising from construction (through dust deposition and smothering of habitats) because of their regular tidal inundation. Subtidal habitats have similarly been scoped out.

9.7.5 In addition, air quality impacts on statutory and non-statutory designated sites arising from dust deposition were scoped out because all sites are beyond the zone of influence in which dust deposition during construction would be predicted with the

implementation of best practice construction methods to minimise fugitive dust emissions.

9.7.6 Impacts during the construction period that have potential to result in significant effects on relevant ecological features, and which were screened into the impact assessment are considered further below:

- Potential effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI (potential changes in air quality as a result of dust deposition on terrestrial habitats), noise and visual disturbance and surface water pollution);
- Potential effects on North Killingholme Haven Pits SSSI (potential noise and visual disturbance);
- Potential effects on Local Wildlife Sites (potential changes in air quality as a result of dust deposition);
- Loss of open mosaic habitat; and
- Potential effects on water vole (loss/ damage to habitat, noise and visual disturbance).

Potential Effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI

Noise and Visual Disturbance to Qualifying Wintering Bird Assemblage

9.7.7 Assessment of the potential for noise disturbance to waterbirds roosting/ loafing/ foraging in the fields on the east side of Rosper Road is presented in the noise impact assessment (Chapter 8: Noise and Vibration). A qualitative soundscape assessment of ambient sources of noise currently experienced by waterbirds feeding, loafing and roosting on the fields east of Rosper Road was undertaken by an AECOM noise specialist on 20th July 2018.

9.7.8 The fields are surrounded by industrial development, with the AMEP car storage area to the north, a fuel bunkering facility to the east (between the fields and the Estuary), and a bulk handling facility to the south and east (between the fields and the Estuary). Further east along the estuary frontage are oil tanker jetties (including Humber International Terminal). Rosper Road forms the western boundary of the fields.

9.7.9 The soundscape within the Rosper Road fields has contributions from several sources:

- Ships – both those moored on jetties serving the various port operations along the river and those moving along the river itself. The sources of this sound included the ship's engines and the operations associated with loading and offloading of bulk materials and vehicles. The engine sound was typical of large diesel engines and at some locations included an audible low frequency tonal element. This sound was most significant along the north eastern edge of the study area closest to the river;

- Bulk handling facility - this included transient noise from material movements and steady noise from conveyors. This sound was most significant at the eastern corner of the study area;
- Vehicle movements on Rosper Road – this was a busy road with HGV and car movements principally serving the car import/export areas. This was the dominant source of ambient (average) sound (L_{Aeq}) in the western parts of the study area near Rosper Road;
- Vehicle movements on the AMEP car import/export site – this sound was transient in nature and was present along the north western edge of the study area;
- Immingham VPI CHP plant – operational noise from equipment including fan sound, stack sound etc. This was the dominant source of background (underlying) sound in the parts of the study area close to Rosper Road, but was not audible above the ship and bulk handling sound along the eastern edge; and
- TLOR – operational noise from the oil refinery including periodic loud sirens, which were audible at most locations surrounding the Rosper Road fields.

9.7.10 It was also noted that lighting to some parts of the car import/export areas appeared to be provided by diesel powered lighting towers. These were not operating during the soundscape survey (which was undertaken in the daytime) but it is likely that they will operate at night. The resulting sound would be expected to be audible at the northern corner of the Rosper Road fields i.e. those closest to the AMEP development.

9.7.11 There is a rail line running along the north eastern edge of the Rosper Road fields. There were no rail movements on the line during the soundscape assessment. It is however, understood that the line is still in occasional use.

9.7.12 The measured sound levels across the Rosper Road fields ranged from 61 dB L_{Aeq} and 51 dB L_{AF90} along Rosper Road to 48 dB L_{Aeq} and 43/46 dB L_{AF90} along the eastern edge. These are daytime levels and the L_{Aeq} (ambient) values include contributions from some sources that are likely to be less significant at night. The L_{AF90} (background) values were dominated by steady sources which are likely to be present during the day and night.

9.7.13 None of the construction activities will generate noise that would be discernible above the ambient noise environment of the industrial sites surrounding the Rosper Road fields. It is therefore reasonable to conclude that construction activities will not result in any displacement or disturbance of birds from the Rosper Road fields. Noise disturbance associated with the construction of the Proposed Development is therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar.

9.7.14 Construction of the Proposed Development may require the use of piling techniques. Should piling be required, an assessment of the likely impact on birds will be

undertaken and presented in the Ecological Impact Assessment, along with any mitigation requirements.

Visual Disturbance to Qualifying Wintering Bird Assemblage

9.7.15 The nature and scale of the construction activities associated with the Proposed Development are not significantly different from any ongoing industrial activities within the area surrounding the Rosper Road fields. This includes ongoing construction activities in the AMEP DCO site to the north, and the Immingham VPI CHP plant to the west of Rosper Road. It is reasonable to assume that the plant, machinery, vehicles and structures used during construction will not result in any material change in the built environment surrounding the Rosper Road fields.

9.7.16 Visual impacts on waterbirds feeding, roosting and loafing in the Rosper Road fields are therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar.

Surface Water Pollution to Habitats Supporting Marine Species

9.7.17 Potential pollution (with sediment or contaminants) arising from surface water run-off from within the Site during construction will be controlled through the adoption of best practice construction methods to meet environmental requirements. Impacts to the adjacent drainage ditch as part of the surface water drainage network for the Proposed Development will be similarly controlled. These measures will be detailed in the CEMP.

9.7.18 It is reasonable to conclude that, with these measures in place, there is no surface water pathway by which the Proposed Development could impact on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI designated habitats, and the ecology features they support (sea lamprey, river lamprey and grey seal).

Potential Effects on North Killingholme Haven Pits SSSI

Noise and Visual Disturbance to Wintering Bird Assemblage

9.7.19 Given the distance between the Proposed Development and SSSI, and the intervening industrial areas (including the car storage areas at Able's Humber Port), it is reasonable to assume that noise and visual disturbance arising from the construction of the Site would not affect the wintering bird assemblage.

Potential Effects on Local Wildlife Sites

9.7.20 There is no potential for adverse effects to the three LWSs identified within the potential zone of influence of the Proposed Development; Burkinshaw's Covert, Station Road Field and Rosper Road Pools. Embedded mitigation for the construction phase will ensure that there is no potential for dust smothering to vegetation as a result of fugitive dust emissions. Similarly, there is no potential for light spillage onto the woodland habitat to the north associated with Burkinshaw's Covert LWS, which may support nocturnal foraging species such as owls and badgers, given that it is 0.4 km from the Site boundary.

9.7.21 There is no hydrological connectivity between the Site and Rosper Road Pools LWS, which lies on the opposite side of Rosper Road to the Site. There are therefore no pathways by which the water quality or hydrological regime of the LWS could be affected by the construction of the Proposed Development.

Loss of OMH

9.7.22 Construction of the Proposed Development would result in the permanent and irreversible loss of approximately 0.75 ha of OMH, which is evaluated as being of district nature conservation value both in terms of its habitats and its assemblage of terrestrial invertebrates.

9.7.23 This habitat type readily establishes on former development land, or land which has otherwise been disturbed. It is a naturally transitional habitat, and in the absence of management or further disturbance, it is reasonable to assume that over time it would eventually succeed to scrubland and thus decline in botanical value (although not over the timeframe considered for the future baseline in this assessment). The loss of 0.75 ha of the County value OMH priority habitat (and the terrestrial invertebrate assemblage it supports) is assessed as minor adverse in the absence of mitigation, which is not significant.

Potential Effects on Water Vole

Loss/ Damage to Habitat

9.7.24 There will be direct impacts on the ditch running along the southern boundary of the Site that may support water vole, as a result of the construction of a drainage outfall as part of the surface water drainage network for the Proposed Development. The exact location of the outfall is yet to be determined, but regardless the impacts on the ditch banks would be expected to be negligible in magnitude and affect only a short stretch of the ditch (c. 2 – 3 m). Any minor habitat losses associated with the ditch would not reasonably be expected to adversely affect water vole given the embedded mitigation proposed in the event that the species is present. The effect is therefore assessed as neutral and not significant.

Noise and Visual Disturbance

9.7.25 There is the potential for noise/ visual disturbance during the construction phase. However, given the industrial nature of the surrounding land use which includes the existing VPI Immingham CHP plant and TLOR, it is reasonable to assume that water voles resident on ditches in this area would be habituated to current operational activity. It is assessed that construction noise would give rise to neutral effects on water voles.

Operation

9.7.26 This section describes the impacts and potential effects during the operational phase of the Proposed Development on relevant ecological features, in the absence of any mitigation over and above that which is inherent to the design.

9.7.27 The following potential source-receptor pathways have been scoped out of the impact assessment in respect of the Humber Estuary designated site:

- Noise/ visual disturbance to qualifying breeding bird species (bittern, marsh harrier, avocet and little tern). There is no suitable habitat for the qualifying species of breeding birds within the potential zone of influence of noise and visual disturbance arising from the operation of the Proposed Development. There is therefore no pathway by which these features could be affected by the Proposed Development;

- Noise and visual disturbance to qualifying wintering bird species feeding on mudflats. The nearest mudflats are approximately 1.5 km away from the Proposed Development, and at this distance any operational noise would reasonably attenuate to within ambient levels. Visual impacts would also not occur given the distances involved; and

- Air quality impacts on intertidal and subtidal habitats. Intertidal habitats are not susceptible to the effects of changes in air quality (e.g. deposition of nitrogen) because of their regular tidal inundation. Subtidal habitats have similarly been scoped out.

9.7.28 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, through increased nitrogen and acid deposition; and

- Disturbance impacts. Increased levels of disturbance (noise, vibration, artificial lighting), potentially resulting in adverse effects on ecological features.

Potential Effects on Humber Estuary SAC/ SPA/ Ramsar/ SSSI

Air Quality Impacts on Habitats

9.7.29 An air quality impact assessment has been undertaken and is presented in Chapter 6: Air Quality. The proposed stack height assessed is considered to be the lowest stack height that would be applied to the plant (45m above ground level), and therefore would result in the worst case impacts. If higher stack heights are employed in the final design, these will improve the dispersion of emissions and therefore reduce the impacts over those presented in this assessment.

9.7.30 There are two measures of particular relevance in when considering the potential for significant effects on habitats to result from changes in air quality arising from the Proposed Development. The first is the concentration of oxides of nitrogen (NO_x) in the atmosphere. The main importance is as a source of nitrogen (N), which is then deposited on adjacent habitats either directly (known as dry deposition, including directly onto the plants themselves) or washed out in rainfall (known as wet deposition). The deposited nitrogen can then have a range of effects, primarily growth stimulation or inhibition, but also biochemical and physiological effects such as changes to chlorophyll content. NO_x may also have some effects which are un-

related to its role in total nitrogen intake (such as the acidity of the gas potentially affecting lipid biosynthesis) but the evidence for these effects is limited and they do not appear to occur until high annual concentrations of NO_x are reached.

9.7.31 The guideline atmospheric concentration of NO_x advocated by Government for the protection of vegetation is 30 micrograms per cubic metre (μgm^{-3}), known as the Critical Level (Ref 9-20). This is driven by the role of NO_x in N deposition and in particular in growth stimulation and inhibition. If the total NO_x concentration in a given area is below the critical level, it is unlikely that N deposition will be an issue, unless there are other sources of nitrogen (e.g. ammonia). If it is above the critical level then local N deposition from NO_x could be an issue and should be investigated.

9.7.32 The second important metric is a direct determination of the rate of the resulting N deposition, which is habitat specific because different habitats have varying tolerance to nitrogen. For many habitats there are measurable effects in the form of published dose-response relationships for N deposition, which do not exist for NO_x. Unlike NO_x, the N deposition rate below which current evidence suggests that effects should not arise is different for each habitat. The rate (known as the Critical Load) is provided on the UK Air Pollution Information System website (www.apis.ac.uk) and is expressed as a quantity (kilograms) of nitrogen over a given area (hectare) per year (kg N/ha/yr). More recently, there has also been research compiled that investigates N dose-response relationships in a range of habitats (Ref 9-20).

9.7.33 For completeness, rates of acid deposition were also calculated. Acid deposition derives from both sulphur and nitrogen. It is expressed in terms of kiloequivalents (keq) per hectare per year. The thresholds against which acid deposition is assessed are referred to as the Critical Load Function.

9.7.34 The air quality impact assessment has concluded that the process contribution resulting from the maximum annual mean NO_x emissions from the stack is 0.3% of the critical level for the Humber Estuary SAC/ SPA/ Ramsar. This is therefore well below the 1% screening threshold at which an adverse effect on the designated habitats (and therefore the species they support) may occur. It is therefore assessed that NOx emissions from the Proposed Development will result in a neutral effect on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI that is not significant.

9.7.35 The air quality impact assessment has concluded that the annual N deposition rate (kg N/Ha/year) would be substantially below 1% of the critical load (<0.1%), and therefore well below the 1% screening threshold at which adverse effects on habitats may occur. It is therefore assessed that N deposition resulting from the Proposed Development will result in a neutral effect on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI that is not significant.

9.7.36 For acid deposition (keq/Ha/year), similarly the air quality impact assessment identified that there would be no significant effects on the identified designated habitat types in the Humber Estuary (acid grassland, calcareous grassland and dwarf shrub heath). The process contribution of sulphur deposition is expected to be negligible because the emissions of SO2 from natural gas combustion are negligible.

Surface Water Pollution to Habitats Supporting Marine Species

9.7.37 Potential pollution (sediment or contaminants) arising from surface water run-off from within the Site during operation will be controlled through the drainage design. This is set out in Chapter 13: Surface Water, Flood Risk and Drainage.

9.7.38 There is therefore no surface water pathway by which the Proposed Development could impact on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI designated habitats, and the ecology features they support (sea lamprey, river lamprey and grey seal).

Noise Disturbance to Qualifying Wintering Bird Assemblage

9.7.39 The nature and scale of the Proposed Development is similar to the surrounding industrial areas, which includes TLOR and the existing VPI Immingham CHP plant. It is therefore reasonable to assume that any SPA/ Ramsar waterbirds roosting/ loafing/ foraging in fields on the east side of Rosper Road are habituated to the industrial nature (and its associated noise and visual impact from chimney stacks, pipe racks, buildings etc.) of the surrounding area such that they would not be adversely affected.

9.7.40 Although no baseline noise monitoring was undertaken in the fields on the east side of Rosper Road, a noise specialist visited the site in July 2018 to undertake a qualitative appraisal of the baseline noise environment, to enable the noise modelling to be placed into context with its surrounds. Ambient noise measurements were also made. Key sources of current noise to the Rosper Road fields arise from shipping activity in the estuary, rail freight movements on the rail line, the coal handling facility and various sirens and engine humming from the surrounding industrial environment e.g. from the existing VPI Immingham CHP plant, which is to the south-west of the fields, and TLOR further to the west (see paragraphs above in construction noise assessment).

9.7.41 Noise modelling has been undertaken for the operational phase of the Proposed Development (see Chapter 8: Noise and Vibration). A noise contour plot for operational noise has been provided , and confirms that that noise levels arising from the operation of the Proposed Development will have attenuated to below 50 dB L_{Aeq} across the majority of the fields, with only the most western edge (along the boundary to Rosper Road) experiencing worst case operational noise levels of 57 dB L_{Aeq}. The plant sound level along the eastern edge of the fields will be below 40 dB L_{Aeq}. These levels are well within the ambient range of noise levels across these fields, which was between 61 dB L_{Aeq} and 51 dB L_{AF90} along Rosper Road at the closest point of the field nearest to the Proposed Development, to 48 dB LAeq and 43/46 dB L_{AF90} along the eastern edge.

9.7.42 On this basis, it is reasonable to conclude that operational noise arising from the Proposed Development will not result in any increase in the baseline noise levels experienced by waterbirds that may be using the fields east of Rosper Road across the high tide period.

9.7.43 Noise and visual disturbance associated with the operation of the Proposed Development is therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar.

Visual Disturbance to Qualifying Wintering Bird Assemblage

9.7.44 The nature and scale of the Proposed Development are not significantly different from any existing industrial sites within the area surrounding the Rosper Road fields, which include the existing VPI Immingham CHP plant and TLOR to the west of Rosper Road. It is reasonable to assume that the structures in place during operation will not result in any material change in the built environment surrounding the Rosper Road fields. Visual impacts on waterbirds feeding, roosting and loafing in the Rosper Road fields are therefore assessed as giving rise to a neutral effect on the qualifying wintering bird assemblage of the Humber Estuary SPA/ Ramsar.

Potential Effects on North Killingholme Haven Pits SSSI

Noise and Visual Disturbance to Wintering Bird Assemblage

9.7.45 Given the distance between the Proposed Development and SSSI, and the intervening industrial areas (including the car storage areas at Able's Humber Port), it is reasonable to assume that noise and visual disturbance arising from the operation of the Site would not affect the wintering bird assemblage.

Air Quality Impacts on Habitats

9.7.46 The air quality impact assessment has concluded that the process contribution resulting from the maximum annual mean NO_x emissions from the stack is 0.2% of the critical level for North Killingholme Haven Pits SSSI. Similarly, the annual N deposition rate is substantially below the 1% of the critical load. The emissions therefore do not exceed the 1% threshold at which an adverse effect on the SSSI designated habitats (and therefore the species they support) may occur. The habitats are not susceptible to acid deposition and therefore no assessment of this metric was undertaken.

9.7.47 It is assessed that NO_x emissions and N deposition to the SSSI arising from the Proposed Development will result in a neutral effect on the North Killingholme Haven Pits SSSI, which is not significant.

Potential Effects on Local Wildlife Sites

Air Quality Impacts on Habitats

9.7.48 The air quality impact assessment has considered potential air quality impacts arising from acid and nitrogen deposition from the stacks on the non-statutory sites identified within 1 km of the Site, although there are no baseline data for these sites as there are for the statutory designated sites. Various assumptions on the habitat types have therefore been made to inform the modelling process.

9.7.49 The closest LWS to the Proposed Development is Burkinshaw's Covert LWS is approximately 0.3 km north of the Site. The air quality impact assessment has concluded that even at the closest LWS receptor, the Proposed Development gives

rise to a maximum of 0.1% of the annual mean critical level for atmospheric NOx. This is assessed as an imperceptible change in the Predicted Environmental Concentration (PEC) and therefore the effect on the LWS habitats is assessed as neutral and not significant. For all other LWSs, the magnitude of change in atmospheric NO_x emissions is significantly lower (0.1% or below) and thus also assessed as resulting in a neutral effect on LWS habitats.

9.7.50 For N and acid deposition, no critical loads are defined for the LWS habitat types, and therefore no assessment of these metrics has been possible.

Potential Effects on Water Vole

9.7.51 There will be no direct impacts to the ditch running along the southern boundary of the OCGT Power Station Site that may support water vole.

9.7.52 There is the potential for noise/ visual disturbance during the operational phase. However, given the industrial nature of the surrounding land use which includes the existing VPI Immingham CHP plant and TLOR, it is reasonable to assume that water voles resident on ditches in this area would be habituated to current operational activity. It is assessed that operational noise would give rise to neutral effects on water voles.

9.7.53 Embedded mitigation in the drainage design to control surface water run-off during operation will ensure that there is negligible potential for any pollution to habitats that may be used by foraging/ passage water vole. Similarly, discharge will be attenuated on site to greenfield run-off rates, and therefore there is no potential for any impacts on the water levels within the ditch.

Decommissioning

9.7.54 Impacts associated with the decommissioning phase of the Proposed Development are likely to be of a similar nature to those associated with the construction phase and as a result the potential effects on ecological features are not anticipated to differ significantly from those predicted at construction. The extent of habitat loss that is likely to be required during decommissioning is likely to be much less than at construction, and the resulting effects on ecological features are therefore likely to be reduced. As described above, appropriate pre-works surveys and mitigation or impact avoidance measures will be implemented for the decommissioning phase as necessary.

9.8. Mitigation and Enhancement Measures

9.8.1 Should the pre-construction survey for water vole identify the presence of this species, either a PWMS (implemented under the Natural England class licence system) would be prepared or Natural England site-specific licence obtained, whichever is considered necessary to achieve legislative compliance in respect of this species. Given the limited impacts of the construction of the outfall and headwall in terms of magnitude and duration, it is reasonable to expect that mitigation can be implemented through a class-licensed PWMS rather than triggering the requirement for a site-specific Natural England licence, but this would be reviewed following the survey. Mitigation will involve the displacement of water

voles (at an appropriate time of year) from the affected section of bank, and micro-siting of the outfall to minimise impacts on existing burrows.

9.8.2 Mitigation for the loss of terrestrial invertebrate habitat on the Site will be delivered through the creation and management of areas of species-rich wildflower grassland in undeveloped areas of the Site.

9.8.3 In addition, the following habitat enhancements are proposed to meet the requirements of the NPPF:

- Creation of log pile refuges in undeveloped parts of the Site (in the southern parts of the Main OCGT Power Station Site close to the ditch corridor) to create ecological niches for reptiles, amphibians and terrestrial invertebrates.
- Installation of bird nest boxes on buildings.
- Planting of native species of trees and berry-bearing shrubs to provide nesting opportunities for breeding birds, and sources of food for overwintering and passage birds.

9.8.4 A Biodiversity Enhancement and Management Plan (BEMP) will be prepared and agreed with the local planning authority prior to the commencement of works, which will be in accordance with the framework BEMP that will accompany the DCO application. The BEMP will include details on:

- Protected species mitigation;
- The location and planting specifications for habitat enhancements;
- The location and construction specifications for log pile refuges and bird nest boxes;
- Long-term management of the habitats;
- Any post-construction protected species monitoring (if required); and
- Timetables and responsibilities for undertaking the above tasks.

9.9. Limitation or Difficulties

9.9.1 No limitations to the collection of survey data have been identified.

9.10. Residual Effects and Conclusions

9.10.1 The Proposed Development will result in no significant effects on qualifying wintering bird species of the Humber Estuary SPA/ Ramsar as a result of noise or visual disturbance to functionally linked habitat adjacent to the Site. There will be no adverse air quality or surface water quality effects on any statutory or non-statutory designation.

9.10.2 The loss of the County value terrestrial invertebrate habitat within the Proposed Development site will be offset by the creation and management of areas of species-rich wildflower grassland. Once established, the new areas of grassland will mitigate the impact of habitat loss at the County level, but will not fully offset the habitat areas lost within the site (by virtue of the amount of area required for the Proposed Development). The residual effect on terrestrial invertebrates is therefore assessed as minor adverse, significant at the local level only.

9.10.3 No significant effects on other ecology features have been identified.

9.11. References

Ref 9-1 Department for Energy and Climate Change (2011) *National Policy Statement for Energy (EN-1).*

Ref 9-2 Department for Communities and Local Government (2012) *National Planning Policy Framework.*

Ref 9-3 North Lincolnshire Council (2011) *North Lincolnshire Local Development Framework - Core Strategy Adopted June 2011.*

Ref 9-4 JBA Consulting (2018) *North Lincolnshire Local Plan Issues & Options – Habitats Regulations Assessment Screening Report January 2018*. Prepared on behalf of North Lincolnshire Council by JBA Consulting, Doncaster.

Ref 9-5 Joint Nature Conservation Committee and Defra (2012) *UK Post-2010 Biodiversity Framework.*

Ref 9-6 Joint Nature Conservation Committee (1994) *UK Biodiversity Action Plan.*

Ref 9-7 Department for Environment, Food and Rural Affairs (2011) *Biodiversity 2020, A Strategy for England's Wildlife and Ecosystem Services.*

Ref 9-8 Lincolnshire Biodiversity Partnership (2011). *Lincolnshire Biodiversity Action Plan*.

Ref 9-9 CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, second Edition*. Chartered Institute of Ecology and Environmental Management, Winchester.

Ref 9-10 SLR Consulting Ltd (2017) VPI Immingham Site Walkover – Phase 3 Consultancy Services. Prepared on behalf of VPI Immingham Ltd by SLR Consulting Ltd.

Ref 9-11 Catley, G. P. (2017) *Winter bird survey of designated land at North Killingholme January – March 2017*. Report prepared for VPI Immingham LLP.

Ref 9-12 Joint Nature Conservation Committee (JNCC) (2010) *Handbook for Phase 1 habitat survey – a technique for environmental audit*. JNCC, Peterborough

Ref 9-13 Oldham, R.S., Keeble, J., Awan, M.J.S. & Jeffcote, M. (2000) *Evaluating the suitability of habitat for the Great Crested Newt* (Triturus cristatus). Herpetological Journal 10 (4), 143 – 155.

Ref 9-14 Briggs, J., Ewald, N., Valentini, A., Gaboriaund, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. & Dunn, F. (2014) *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field*

and laboratory sampling of great crested newt (Triturus cristatus) *environmental DNA*. Freshwater Habitats Trust, Oxford

Ref 9-15 Froglife (1999) *Froglife Advice Sheet 10: reptile survey*. Froglife, Halesworth.

Ref 9-16 Marchant, J.H. (1983). *British Trust for Ornithology (BTO) Common Birds Census Instructions*. BTO, Tring.

Ref 9-17 Drake, C. M., Lott, D. A., Alexander, K. N. A., and Webb, J. (2007). Surveying terrestrial and freshwater invertebrates for conservation evaluation. Natural England Research

Ref 9-18 SLR Consulting Limited (2017) *Marsh Lane Car Storage Facility: Environmental Statement – Chapter 8 Ecology*. Prepared on behalf of Able Humber Ports Limited by SLR Consulting Ltd.

Ref 9-19 Able UK Ltd (2012) *Able Marine Energy Park Environmental Statement: Chapter 11 – Terrestrial Ecology and Birds*. Prepared for Able UK Ltd by Environmental Resources Management.

Ref 9-20 Hall, J., Bealey, B. & Wadsworth, R. (2006) *Assessing the risks of air pollution impacts to the condition of Areas/ Sites of Special Scientific Interest in the UK*. JNCC, Peterborough.