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12. Terrestrial Ecology and Nature Conservation

12.1 Introduction

12.1.1 This chapter of the Environmental Statement (ES) identifies the potential impacts and effects on terrestrial ecology and nature conservation that are to be considered as part of the Environmental Impact Assessment (EIA) of the Proposed Development. The assessment has been undertaken in accordance with best practice guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2019) (the CIEEM guidance).

12.1.2 Given the stated terrestrial scope of this chapter it excludes assessment of potential impacts and effects on all geological designations and notable geological features which are covered by other chapters in ES Volume I (Document Ref. 6.2) (see Chapter 10: Geology, Hydrogeology and Contaminated Land), all strictly freshwater designations, habitats, plants, invertebrates and fish (see Chapter 13: Aquatic Ecology), all intertidal and marine designations, habitats and species present below the mean high water spring tideline (see Chapter 14: Marine Ecology and Nature Conservation), and all bird species and ornithological designations (see Chapter 15: Ornithology) (ES Volume I, Document Ref. 6.2).

12.1.3 This chapter is supported by the following technical appendices, provided in (ES Volume III, Document Ref. 6.4):

- Appendix 12A: Legislation and Planning Policy Relevant to Ecology and Nature Conservation;
- Appendix 12B: Ecological Impact Assessment Methods;
- Appendix 12C: Preliminary Ecological Appraisal (PEA) Report;
- Appendix 12D: Bat Survey Report;
- Appendix 12E: Reptile Survey Report;
- Appendix 12F: Invertebrate Survey Report;
- Appendix 12G: Water Vole and Otter Survey Report;
- Appendix 12H: Supplementary Habitat Information Report for Coatham Sands;
- Appendix 12I: Terrestrial Invertebrate Survey Report for Coatham Sands; and
- Appendix 12J: Great Crested Newt Screening Report.

12.1.4 The above appendices contain all of the Figures necessary to understand the findings of the ecological surveys undertaken for the Proposed Development. Other general Figures showing the location and layout of the Proposed Development are provided in ES Volume II (Document Ref 6.3).

12.1.5 This chapter is also supported by the Habitats Regulations Assessment Report (Document Ref. 5.13).

12.2 Legislation and Planning Policy Context

Legislation

12.2.1 The following legislation is relevant to the scope of this chapter and has been taken into account in the assessments where relevant:

- The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations);
- Wildlife and Countryside Act 1981 (as amended) (the WCA);
- The Hedgerow Regulations 1997;
- Countryside and Rights of Way (CRoW) Act 2000;
- Natural Environment and Rural Communities (NERC) Act 2006;
- Protection of Badgers Act 1992;
- Wild Mammals (Protection) Act 1996;
- Environmental Protection Act 1990; and
- Invasive Alien Species (Enforcement and Permitting) Order 2019.

12.2.2 Further information on legislation relevant to terrestrial ecology, and other ecology topics, is provided in Appendix 12A: Legislation and Planning Policy (ES Volume III, Document Ref. 6.4).

Planning Policy

12.2.3 The Government's policy for delivery of major energy infrastructure that is of relevance to this chapter is set out in the following National Policy Statements (NPS):

- Overarching NPS for Energy (EN-1);
- Fossil Fuel Electricity Generating Infrastructure (EN-2); and
- Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4).

12.2.4 Together the above NPS require that, where the development concerned is subject to EIA, the applicant should:

- ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of biodiversity conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (paragraph 5.3.3, NPS EN-1);
- show how the project has taken advantage of opportunities to conserve and enhance biodiversity interests (paragraph 5.3.4, NPS EN-1);
- include appropriate mitigation measures as an integral part of the Proposed Development. Where the applicant cannot demonstrate that appropriate mitigation measures will be put in place then appropriate

requirements should be attached to any consent and/or planning obligations entered into (paragraph 5.3.18 to 19, NPS EN-1);

- take account of likely environmental impacts resulting from air emissions (paragraph 2.5.6, NPS EN-2);
- include an assessment of the biodiversity effects of proposed gas supply pipeline routes and of the main alternative routes considered, and include proposals for reinstatement of the pipeline route as close to its original state as possible (paragraph 2.21.3, NPS EN-4); and
- where the habitat to be crossed contains ancient woodland, trees subject to a Tree Preservation Order, or hedgerows subject to the Hedgerows Regulations 1997, consider whether it would be feasible to use trenchless technologies under the ancient woodland or thrust bore under the protected tree or hedgerow (paragraph 2.21.6, NPS EN-4).

12.2.5 The policies set out in the National Planning Policy Framework (NPPF) (February 2019, updated 19 June 2019) are also important and relevant matters to the Application. The NPPF sets out the Government's planning policies for England and how these are to be applied, and identifies overarching objectives, including environmental objectives (such as protecting and enhancing our natural environment and improving biodiversity). It introduces additional considerations, including definitions of and requirements in relation to, irreplaceable habitats which must be addressed in the development design and assessment process. For additional information, see Chapter 7: Legislative and Planning Policy Context (ES Volume I, Document Ref. 6.2).

12.2.6 The Proposed Development includes infrastructure located within the administrative boundaries of Redcar and Cleveland Borough Council (RCBC) and Stockton-on-Tees Borough Council (STBC). Therefore, the following local planning policies are relevant to the Proposed Development:

- Sustainable Development Policies SD1 and SD4 of the Redcar and Cleveland Local Plan, adopted May 2018. These policies to relate to requirements for sustainable development, respecting and enhancing biodiversity features and protecting the integrity of Natura 2000 sites;
- Local Spatial Strategy Policy LS4 of the Redcar and Cleveland Local Plan, adopted May 2018. The South Tees Spatial Strategy requires measures to protect European sites, to safeguard and improve sites of biodiversity interest particularly along the River Tees and the estuary, and to encourage integrated habitat creation and management;
- Natural Environment Policies N2 and N4 of the Redcar and Cleveland Local Plan, adopted May 2018. These require the protection and enhancement of the Borough's green infrastructure network and green wedges, and biodiversity and geological resources, including avoidance of adverse impacts to internationally and nationally statutory nature conservation designations;
- Sustainable Development Policies SD5 and SD8 of the Stockton-on-Tees Local Plan, adopted January 2019. These set out requirements for

the conservation and enhancement of the natural environment, including designations, green infrastructure, priority habitats, ecological networks, woodland and priority species;

- Natural Environment Policy ENV5 and ENV6 of the Stockton-on-Tees Local Plan, adopted January 2019. These set out requirements for the protection and enhancement of biodiversity, including maximising biodiversity gains within identified Biodiversity Opportunity Areas (BOAs) in the River Tees Corridor and Teesmouth; and
- Development Principle STDC7 of the Redcar and Cleveland South Tees Area Supplementary Planning Document (SPD) adopted May 2018 sets out expectations for natural environment protection and enhancement, including the requirement to comply with Redcar and Cleveland Local Plan Policy N4 (see above).

12.2.7 Additional planning policy and guidance of potential relevance to the scope of this chapter and/or for interpretation of the above planning policy is given in the following documents:

- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Department for Environment, Food and Rural Affairs (Defra), 2011);
- Planning Practice Guidance: Natural Environment (Ministry of Housing, Communities and Local Government, 2019);
- Standing Advice issued by Natural England and Department for Environment, Food and Rural Affairs: Protected species and development (Natural England and Defra, 2020);
- Supplementary Planning Document 1: Sustainable Design Guide (Stockton-on-Tees Borough Council, 2011);
- Tees Valley Green Infrastructure Strategy (Tees Valley Joint Strategy Unit, 2008);
- Redcar and Cleveland's Green Space Strategy 2006-2016 (Redcar and Cleveland Partnership, 2006);
- The Tees Lowlands National Character Area (NCA) Profile (Natural England, 2013);
- A Biodiversity Audit of the North East (Brodin, 2001); and
- Priority Habitats and Species in the Tees Valley (Tees Valley Nature Partnership, 2012).

12.2.8 Further information on this policy and guidance is provided in Appendix 12A: Legislation and Planning Policy (ES Volume III, Document Ref. 6.4).

12.3 Assessment Methodology and Significance Criteria

12.3.1 This section presents the methodology for assessing the impacts of the Proposed Development on terrestrial ecology.

Use of the Rochdale Envelope

12.3.2 In accordance with the Planning Inspectorate (PINS) Advice Note 9 (PINS, 2018), the ES presents a robust yet reasonable worst-case assessment of the potential impacts of the Proposed Development on terrestrial ecology, using Rochdale Envelope principles where a degree of flexibility needs to be maintained for certain aspects of the design.

12.3.3 The exact nature of the Proposed Development and the scope of the necessary construction works is dependent, in some cases, on the condition of existing infrastructure. Investigations into the feasibility of using available existing infrastructure are ongoing and so for the purpose of this ES, the reasonable worst-case scenario has been assumed. Further information can be found in Chapter 5: Construction Programme and Management and Table 4.1 of Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).

Impact Assessment and Significance Criteria

12.3.4 Ecological Impact Assessment (EcIA) is the process of identifying, quantifying and evaluating potential effects of development-related or other proposed actions on habitats, species and ecosystems and forms the ecological component of the wider EIA.

12.3.5 The EcIA detailed in this chapter has been undertaken in accordance with the CIEEM guidance (2019). Full details of the approach applied are provided in Appendix 12B: Ecological Impact Assessment Methods (ES Volume III, Document Ref. 6.4), with an abridged overview provided below. The aims of the ecology assessment are to:

- identify relevant ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted;
- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate a 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 what steps would be taken to adhere to legal requirements relating to the relevant biodiversity and geological features concerned.

12.3.6 The principal steps involved in the CIEEM guidance can be summarised as:

- ecological features that are both present and could 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 nature conservation value into geographic context, and this is used to define the relevant features that need to be considered further within the impact assessment process;
- 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 considered;
- 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; and
- any residual effects of the Proposed Development are reported.

12.3.7 It is not necessary in the assessment to address all habitats and species with potential to occur in the Study Area, and instead the focus should be on those that are 'relevant'. The CIEEM guidance (2019) makes clear that there is no need to "*carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and would 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 throughout the design evolution process, for example by avoiding impacts to ponds and watercourses regardless of whether protected species have been recorded in these water bodies.

12.3.8 To support focussed EcIA, there is a need to determine the scale at which the relevant ecological features, identified through the desk studies and field surveys undertaken for the Proposed Development, are of value. The value of each relevant biodiversity and geological feature has been defined with reference to the geographical scale at which it matters. The frames of reference used for this assessment, and based on the 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 English context relative to Great Britain as a whole);
- Regional (North East);
- County (North Riding of Yorkshire, County Durham);
- Borough (RCBC and STBC);

- Local (biodiversity features that do not meet criteria for valuation at a borough or higher level, but that have sufficient value to merit retention or mitigation e.g. for purposes of ensuring no net loss of biodiversity); and
- Negligible (common and widespread biodiversity 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).

12.3.9 In line with the CIEEM guidance 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 ecological features. 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.

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

- Beneficial (i.e. positive) - a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value;
- Adverse (i.e. negative) - a change that reduces the quality of the environment e.g. destruction of habitat or increased noise disturbance;
- Magnitude - the ‘size’, ‘amount’ or ‘intensity’ of an impact - this is described on a quantitative basis where possible;
- Spatial extent - the spatial or geographical area or distance over which the impact/effect occurs;
- Duration - the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to the relevant biodiversity and geological characteristics, for example 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. whether the impact is 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.

12.3.11 For each ecological feature, only those characteristics relevant to understanding the effect and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant 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.

12.3.12 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).

Table 12-1: Relationship Between CIEEM Assessment Terminology and those Used in Other ES Chapters

CIEEM assessment terminology	Equivalent terminology used in other ES chapters (as set out in Table 2-1 of Chapter 2, ES Volume I, Document Ref. 6.2)	
Beneficial effect on structure/function or conservation status at Regional, National or International level	Significant (beneficial)	Major beneficial
Beneficial effect on structure/function or conservation status at Borough or County level		Moderate beneficial
Beneficial effect on structure/function or conservation status at Site or Local level	Not significant	Minor beneficial
No effect on structure/function or conservation status	Not significant	Neutral
Adverse effect on structure/function or conservation status at Site or Local level	Not significant	Minor adverse
Adverse effect on structure/ function or conservation status at Borough or County level	Significant (adverse)	Moderate adverse
Adverse effect on structure/function or conservation status at Regional, National or International level		Major adverse

12.3.13 The CIEEM guidance described in Appendix 12B: Ecological Impact Assessment Methods (ES Volume III, Document Ref. 6.4) broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology (ES Volume I, Document Ref. 6.2). However, the matrix has not been used to classify effects as this would deviate from CIEEM guidance. In order to provide consistency of terminology in the final assessment, the findings of the CIEEM assessment have been translated into the classification of effects scale used in other chapters of the ES as outlined in Table 12-1. The category of 'Negligible' effects, defined in Chapter 2: Assessment Methodology (ES

Volume I, Document Ref. 6.2) as an "*imperceptible effect to an environmental resource or receptor*", is analogous to the category of 'Neutral' as set out below.

Study Area

12.3.14 The Study Areas originally used to gather baseline data for this assessment, as first introduced in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4), were specified to support collation of sufficient data to meet worst-case data needs for robust ecological impact assessment in accordance with Rochdale Envelope principles. These Study Areas were often relatively precautionary and consequently have gradually been reduced as the design of the Proposed Development has been refined and fixed further.

12.3.15 Accordingly, the aim within this chapter is to define appropriately the extent of the Study Areas so that these accurately reflect the areas within which the Proposed Development could interact with relevant ecological features in a manner sufficient to have an adverse effect (the so called 'Zone of Influence' (ZoI)). This chapter therefore does not need to address any identified ecological features for which there is no likelihood of an adverse effect.

12.3.16 The relevance of each ecological feature identified has been considered on a case by case basis, as first considered in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4) and as finally determined in Table 12-5 of this chapter. This approach has applied professional judgement based on understanding of the ecology and relative sensitivities of the features concerned and the relevant aspects of the Proposed Development that are likely to interact with them. It has also considered relevant good practice guidance, the relative nature conservation importance of the features concerned, and any implications arising from relevant legal protections.

12.3.17 It is important to recognise that the ZoI of the Proposed Development may also vary over time. The construction zone of influence on an ecological feature may be more or less that of the operational ZoI. For example, noise disturbance to species is likely to be more extensive and of higher magnitude during construction. In comparison, operational air quality impacts on habitats are likely to be more extensive than construction air quality impacts. Typically, the ZoI is greatest during construction but there can be significant exceptions to this, particularly when considering potential air quality impacts and effects.

12.3.18 In addition, requirements of regulators and other good practice guidance has also influenced the Study Areas adopted. While these sometimes over-estimate the likely ZoI, they are considered sufficiently precautionary to meet requirements for robust ecological impact assessment. For example, regulators and statutory consultees e.g. the Environment Agency and Natural England require assessment of potential operational air quality impacts and effects on all national and international nature conservation designations within 15 km, but only require assessment of local designations within 2 km. These are therefore the good practice Study Areas adopted within this chapter for nature conservation designations.

Sources of Information

12.3.19 The biodiversity baseline has been determined through a combination of desk study and field survey, as summarised below. The extent of the Study Areas applied during the desk study and field surveys are also identified, with further information provided in Appendices 12C-12I (ES Volume III, Document Ref. 6.4). The approach to baseline development, field surveys and the wider EcIA has been discussed and agreed with Natural England and other relevant stakeholders.

Desk Study

12.3.20 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 12-2 and is described further in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4).

12.3.21 Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the WCA; Schedules 2, and 5 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 habitats and species have also been considered and assessed on a case by case basis, e.g. those included in national, regional or local Red Data Books and Lists but not protected by legislation. This is consistent with the requirements of the CIEEM guidance (2019) and relevant planning policy.

12.3.22 Records of non-native controlled weed species, as listed under Schedule 9 of the WCA, were also collated and have been considered when assessing the potential ecological effects of the Proposed Development. It would not be appropriate to attribute the same weight to these non-native weed species as has been applied to relevant ecological features when determining the likely significant effects of the Proposed Development, as the presence of such species is generally detrimental for ecology, and conversely the removal of such species would usually be considered desirable and beneficial for ecology. The requirements to control such weeds, particularly to prevent further spread, is also driven by the WCA and related legislation. Therefore, while the weed species concerned are not relevant ecological features for the purposes of EcIA, there is still a need to consider them in terms of their potential relevance to delivery of legislative compliance, for their potential to contribute to the amplification of any adverse effects arising from the Proposed Development, or their potential to conflict with objectives for ecological mitigation, compensation and enhancement.

Table 12-2: Desk Study Area and Data Sources

Data Source	Date	Data Obtained
Multi-Agency Geographic Information for the Countryside (MAGIC) website https://magic.defra.gov.uk/	December 2020	• International and national statutory nature conservation designations within 15 km of the Combined Cycle Gas Turbine (CCGT) power station (due to requirements for air quality impact assessment) or otherwise within an Impact Risk Zone (IRZ) identified by Natural England and relevant to the wider Proposed Development (i.e. within an IRZ for 'infrastructure development'); • Local statutory designations and ancient woodlands within 2 km; and • Notable habitats within 1 km.
Joint Nature Conservation Committee (JNCC) Website (UK Protected Sites) http://jncc.defra.gov.uk/	December 2020	• Citations for international nature conservation designations: Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites.
Natural England Website https://designatedsites.naturalengland.org.uk/SiteSearch.aspx	December 2020	• Citations for national nature conservation designations: Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR); and • Details on Local Nature Reserves (LNR)
Environmental Records and Information Centre (ERIC) North-East	March 2018, updated January 2021	• Non-statutory designations within 2 km; • Protected and notable species records within 1 km (records for the last 10 years only); and • Priority habitats within 1 km.
Ordnance Survey 1:25,000 Pathfinder maps and aerial photography	December 2020	Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential protected and notable species constraints.

Data Source	Date	Data Obtained
Tees Valley Nature Partnership Website	January 2020	• General information on Local Biodiversity Action Plan Priority Habitats and Species.
Industry Nature Conservation Association (INCA)	September 2019, April 2020	• Records of notable species; • Advice on relevant protected species e.g. local status of great crested newt (*Triturus cristatus*); and • Reports of previous surveys undertaken on and adjacent to the land required for the Proposed Development.
Environmental Statement for Dogger Bank Teesside A / Sofia Offshore Wind Farm	April 2020	• Records of notable species extracted from the Peak Ecology Ltd (2014) report (ES Chapter 25, Appendix A1, online at https://infrastructure.planninginspectorate.gov.uk/)

Field Surveys

12.3.23 The scope of works for necessary habitat and protected species surveys was determined through an initial programme (as access to land became available) of Phase 1 Habitat survey and PEA as described in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4).

12.3.24 The field surveys undertaken to inform the EcIA are summarised in Table 12-3. Full details of the scope and methods for each survey, along with any associated limitations, are provided in the cross-referenced technical appendices.

Table 12-3: Summary of the Ecological Field Surveys Completed

Ecological survey	Technical appendix (ES Volume III, Document Ref. 6.4)	Survey scope
Preliminary Ecological Appraisal	12C	The Site.
Habitat survey	12C 12H	The Site, within limits of agreed land access. Top-up habitat and botanical survey completed at Coatham Sands (part of Teesmouth and Cleveland Coast SSSI) to inform options appraisal for the CO_2 Export Pipeline.
Preliminary bat roost assessment (buildings and trees)	12D	Relevant structures that will need to be demolished for construction of the PCC Site were surveyed. No requirements for further surveys of structures and trees were identified in relation to the Proposed Development, although some additional structures were surveyed in 2018 prior to selection of the final location for the PCC Site.
Bat activity survey (walked transects)	12D	Within PCC Site and adjacent land as this is the focus of the permanent land take. Within Coatham Sands (part of Teesmouth and Cleveland Coast SSSI) to inform options appraisal for the CO_2 Export Pipeline.
Otter and water vole survey	12G	Five waterbodies within and adjacent to the PCC site: The Fleet, Power Station Pond, Steel House Pond, The Mill Race and Railway Channel.
Great crested newt screening appraisal	12J	Potential waterbodies within 250 m of the Site boundary identified and screened further for their potential to support great crested newt.
Reptile survey	12E	Within PCC Site and adjacent land as this is the focus of the permanent land take. Within Coatham Sands (part of Teesmouth and Cleveland Coast SSSI) to inform options appraisal for the CO_2 Export Pipeline.
Terrestrial invertebrate survey	12F 12I	Within PCC Site and adjacent land as this is the focus of the permanent land take. Within Coatham Sands (part of Teesmouth and Cleveland Coast SSSI) to inform options appraisal for the CO_2 Export Pipeline.

Consultation

12.3.25 Pre-application engagement has been ongoing with Natural England since 2017 (as the primary consultee on ecological and nature conservation matters, and because of the proximity of the Proposed Development to a number of national and international nature conservation designations). This consultation is summarised below:

- July 2017 (Pre-Application engagement meeting);
- September 2017 (Methodology and scope review);
- March 2019 (Pre-Application engagement meeting);
- April 2019 (Pre-Application engagement meeting);
- February 2020 (Pre-Application engagement meeting); and
- July 2020 (Stage 2 consultation – Preliminary Environmental Information (PEI) Report).

12.3.26 Consultation for the Proposed Development has been ongoing and commenced at the EIA Scoping Stage with the preparation of the EIA Scoping Opinion Report which was submitted in February 2019. A Scoping Opinion was received from the Planning Inspectorate in April 2019 (see Appendix 1A in ES Volume III, Document Ref. 6.4).

12.3.27 The Applicants also undertook a formal Section 42 and Section 47 consultation, which commenced at the same time as the publication of the PEI Report in early July 2020 and ended in September 2020. The issues that have been raised through consultation, and how these have been considered and addressed within the design evolution of the Proposed Development and the EIA is set out where relevant within each of the topic chapters in the ES and in Chapter 6: Alternatives and Design Evolution (ES Volume I, Document Ref. 6.2).

12.3.28 Table 12-4 provides a summary of how comments raised to date in relation to terrestrial ecology have been considered and actioned where appropriate.

Table 12-4: Summary of Responses

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
Receptors, PINS Scoping Opinion p 31 The Scoping Report identifies the Teesmouth and Cleveland Coast SPA, SPA extension and Ramsar site as being located in proximity to the Proposed Development. The Inspectorate advises that NE is also proposing to extend the Teesmouth and Cleveland Coast Ramsar site (now a Ramsar extension site) and to enlarge the Teesmouth and Cleveland Coast SSSI. The ES should assess the potential impacts to these sites including the proposed extensions.	These extensions do not relate to the remit of this chapter. Instead, the implications of the relevant extensions are dealt within in Chapter 14: Marine Ecology and Nature Conservation, which assesses impacts and effects on the marine ecology features of these designations, and Chapter 15: Ornithology (ES Volume I, Document Ref. 6.2), which assesses impacts and effects on the relevant bird features. Details of the relevant terrestrial interest features of the Teesmouth and Cleveland Coast SSSI are provided in Appendices 12C, 12H and 12I (ES Volume III, Document Ref. 6.4)

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
Study area, PINS Scoping Opinion p31-32 Paragraph 6.21 of the Scoping Report proposes to assess impacts from emissions to air on statutory designated ecological sites within 15 km of the proposed stacks, which is in line with Environment Agency (EA)/Defra guidance. However, paragraph 6.72 only identifies SSSIs within 5 km of the application site. For the avoidance of doubt, the Inspectorate considers that a study area of 15 km should be applied for all statutory designated sites in line with the EA/Defra guidance. The ES should identify all types of potential impact pathways to ecological receptors, including water, soil and air. The ES should justify the chosen study areas relevant to the ecological impact assessment, with reference to relevant guidance and the extent of the likely impacts. The Applicant should make effort to agree these study areas with relevant consultation bodies.	It is confirmed that this is the approach to be taken. Detailed air quality modelling has been completed and is reported in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2) and its supporting Appendices (ES Volume III, Document Ref. 6.4). The relevant findings of the assessment are presented within this chapter.
National and Local designations, PINS Scoping Opinion p 32 The Scoping Report identifies European sites and SSSIs in proximity to the Proposed Development. However, no National Nature Reserves (NNR) or locally designated ecological sites have been identified. The Inspectorate notes that the Teesmouth NNR, a number of local wildlife sites and the Saltholme Royal Society for the Protection of Birds (RSPB) Reserve are located within or in proximity to the application site. The ES should identify any such sites which could be impacted by the Proposed Development and assess any likely significant effects.	All relevant LNR and NNR are identified, with further information contained within Appendix 12C: PEA (ES Volume III, Document Ref. 6.4).
Baseline surveys, PINS Scoping Opinion p32 It is unclear whether the Extended Phase 1 Habitat Surveys covered the entirety of the application site or just the Main Site [PCC Site]. For the avoidance of doubt, the Inspectorate considers that Phase 1 data should be provided for the entirety of the application site. The coverage of species surveys should be sufficient to support a robust assessment of likely significant effects; survey effort should be clearly explained and justified in the ES.	Extended Phase 1 surveys and any associated constraints and limitations are reported in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4). The coverage of the species surveys, as detailed in Appendices 12C to 12J (also ES Volume III), is seen as sufficient to support a robust precautionary assessment of likely significant effects. The results of these surveys and studies have informed the ecological impact assessment presented in this chapter.
CIEEM Guidelines, PINS Scoping Opinion p34 The Applicant proposes to undertake the ecology assessment in accordance with the 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, January 2019) ('the CIEEM guidelines'). The Inspectorate notes that the CIEEM guidelines were updated in 2019 and advises that the most up-to-date version of the guidelines are utilised in the ES.	This chapter considers the CIEEM guidance 2019 updates, as described in more detail in Appendix 12B: Ecological Impact Assessment Methods (ES Volume III, Document Ref. 6.4).

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
Air Quality, PINS Scoping Opinion p35 The assessment of impacts to ecological receptors from changes in air quality should address any likely significant effects from dust and plant during construction and decommissioning, particularly on the designated ecological sites in proximity to the Proposed Development.	The air quality assessment is provided in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2) and supporting appendices which assess the impacts of emissions associated with both construction and operation (Appendices 8A and 8B, ES Volume III, Document Ref. 6.4). The findings of these assessments have informed the assessment of effects on nature conservation designations within this chapter as summarised in Table 12-5.
Habitat gain/loss, PINS Scoping Opinion p35 The ES should identify and quantify all temporary and permanent habitat gains and losses by type (including any functionally linked land).	Information about permanent and temporary habitat losses is provided in this chapter (see Section 12.6: Likely Impacts and Effects). A table summarising permanent habitat losses is provided in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12).
Invasive species, PINS Scoping Opinion p35 Surveys should be undertaken to identify the presence of any invasive species on the application site and any necessary eradication/ control measures detailed in the ES.	The presence of terrestrial Invasive Non-Native Species (INNS) has been recorded as encountered during habitat and botanical surveys. Appropriate mitigation is specified in Section 12.7: Mitigation and Enhancement, with freshwater and marine species dealt with in Chapters 13 and 14 respectively (ES Volume I, Document Ref. 6.2).
Trees and Woodland, PINS Scoping Opinion p35 The Inspectorate notes that there are trees and woodland areas within/adjacent to the application site. The ES should detail any impacts to trees and woodland and describe any mitigation measures proposed. Any likely significant effects should be assessed.	An assessment of impacts and effects on relevant habitats is provided in Section 12.6: Likely Impacts and Effects based on the findings of Appendices 12C and 12H (ES Volume I, Document Ref. 6.2). No loss of mature trees or woodland is considered necessary to permit construction and operation of the Proposed Development.
Supporting data and consultation, Natural England (meeting held 3 April 2019) • NE GIS data is currently being updated and is expected to be available in May • The area of focus for NE is along the 'river channel', north of the A66 (south bank) and the Saltholme area (north bank) that is almost all designated as a SSSI/RSPB reserve. • Biodiversity in the area is subject to a masterplanning approach across the banks of the River Tees involving four local planning authorities • The Tees Estuary Partnership has a memorandum of understanding (MOU) between the EA, NE, MMO and INCA as well as the local authorities and	The advice received has been considered and incorporated as relevant into this ecological impact assessment. The Proposed Development no longer includes an option for the use of open cut methods to cross Teesmouth and Cleveland Coast SSSI. Instead, trenchless methods will be used to bypass the SSSI.

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mapping for opportunities for gain (based on Defra metrics) has been undertaken. • The GI layer for these opportunities is available from INCA. • The South Gare was identified as an area of risk of UXO being present. This drove the Breagh pipeline to be constructed using open cut methods. This was accepted by Natural England on the basis that they had a restoration plan already in place before the works were undertaken. The area is noted to have recovered well. • NE advised that Tees Valley Wildlife Trust operates locally, manages Coatham Marsh and works with INCA. • It was agreed that the Phase 1 of the areas previously not surveyed would be undertaken as soon as possible and shared with NE to agree the need and nature of further survey work. INCA should also be consulted.	
Terrestrial ecology: water dependent habitats and species, Environment Agency, letter response to Stage 2 Consultation dated 30 September 2020 Protected water dependant species and habitats are not fully surveyed. Therefore, no assessment of impacts and mitigation measures have been submitted. As such we cannot comment on the impact of the scheme and will require these to be fully undertaken before the DCO is submitted.	Protected water-dependant species and habitats are not part of the scope of Chapter 12: Terrestrial Ecology. This information is provided in Chapter 13: Aquatic Ecology and Nature conservation (ES Volume I, Document Ref. 6.2). The only exceptions to this are the semi-aquatic species great crested newt, water vole and otter which have been considered and scoped out within this chapter. See Table 12-5.
Terrestrial ecology: water vole, Environment Agency, letter response to Stage 2 Consultation dated 30 September 2020 The Applicant does not appear to be undertaking water vole surveys to land within the Stockton Borough Council area of the development proposal. We would argue that records of water vole are present across the area, in particular around RSPB Saltholme. Surveys are therefore likely required along with other outstanding surveys.	Scoping of requirements for water vole surveys is provided in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4). No impacts on habitats suitable for water vole are anticipated in Stockton-on-Tees due to use of existing infrastructure and watercourse crossing. Consequently, there are no pathways for impact and water voles have been scoped out (Table 12-5).
Terrestrial ecology: impacts on habitats and species, Environment Agency, letter response to Stage 2 Consultation dated 30 September 2020 The project is likely to impact on a number of protected and priority habitats, such as intertidal mudflats or floodplain grazing marsh habitat. If	All habitat and species relevant to the scope of this chapter (terrestrial ecology), as described in Appendices 12C to 12J (ES Volume III, Document Ref. 6.4) have been considered and assessed. Mitigation is specified for all likely significant adverse

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impacts cannot be avoided, then mitigation should be suggested, and only where mitigation can be proved as unsuitable, then compensation; must be presented at the time of submission.	effects. Freshwater and marine habitats and species are addressed within the scope of Chapters 13 and 14 respectively (ES Volume I, Document Ref. 6.2). Intertidal mudflat habitats fall within the scope of the latter chapter.
Terrestrial ecology: invasive species and biosecurity, Environment Agency, letter response to Stage 2 Consultation dated 30 September 2020 The PIER surveys have not highlighted the presence of Japanese Knotweed an Invasive Non-Native Species (INNS). Strict biosecurity measures should be implemented to avoid the importing of non-native invasive species. Equipment, plant and Personal Protective Equipment (PPE) brought to site should be clean and free of material and vegetation. To ensure measures are implemented, it is recommended biosecurity toolbox talks are given to all site staff and rigorous inspections are undertaken of all equipment delivered to site, following the Check Clean and Dry campaign.	The EcIA reflects the current baseline and pathways for impact, including consideration of potential for the spread of terrestrial INNS. The Site boundary identifies all land required for the construction and operation of the Proposed Development, but in some areas existing infrastructure will be relied on and no construction works are proposed. This has informed consideration of the relevant INNS. Relevant biosecurity measures are specified in Section 12.7: Mitigation and Enhancement Measures of this chapter, to address the potential for interaction with terrestrial INNS (good biosecurity presumes risk of presence, rather than targeting measures only at locations of known occurrences). Pre-construction update surveys are proposed to ensure up-to-date information at the time of construction, at which time construction working areas will be much more narrowly defined.
Teesmouth and Cleveland Coast SSSI, Natural England, letter response to Stage 2 Consultation dated 17 September 2020 The proposal will directly impact the Teesmouth and Cleveland Coast SSSI during construction and operation. We note and welcome the commitment to ensure that a fully detailed Environmental Management Plan and Restoration Scheme will be developed and implemented to ensure no long-term detriment to the designated site interest features	No response required.
Protected species, Natural England, letter response to Stage 2 Consultation dated 17 September 2020 Based on the information provided Natural England advises that the proposal has the potential to impact species protected by UK and EU legislation. We note that further species-specific surveys are being undertaken and will be used to inform the EIA, as well as any required protected species licence applications.	All relevant surveys are complete as detailed in Appendices 12C to 12J (ES Volume III, Document Ref. 6.4). Potential impacts on relevant protected species are addressed in Section 12.6: Likely Significant Effect of this chapter.
Woodland, Forestry Commission, letter response to Stage 2 Consultation dated 18 September 2020 Based upon National Forest Inventory figures 2019, Redcar and Cleveland has 12% woodland cover whilst Stockton upon Tees has 6% woodland cover of land in those areas. It would be highly desirable to retain the existing woodland especially as some of	It has been confirmed, following review of the development design and requirements for temporary construction laydown, that all areas of woodland have been avoided and no indirect effects are anticipated. Tree protection measures are included within the

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the Tees Valley area currently has low woodland or tree cover.	Appendix 5A: Framework CEMP (ES Volume III, Document Ref. 6.4).
Teesmouth and Cleveland Coast SSSI, Teesmouth Environmental Trust, email response to Stage 2 Consultation dated 21 July Must minimise potential detrimental effect on the SSSI and any important ecological features.	No construction works are now proposed within the boundary of the SSSI. The SSSI will be bypassed through the use of trenchless construction methods.
North York Moors National Park Authority, letter response to Stage 2 Consultation dated 17 August Alterations in levels of air pollution during construction, operation and decommissioning of the site could impact North York Moors SAC/SPA.	This has been assessed and no significant adverse effects are predicted. Detailed assessment is provided in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2) and its supporting Appendices (ES Volume III, Document Ref. 6.4), and Appendix 15C: LSE Report (PEI Report – not updated).

12.4 Baseline Conditions

Existing Baseline

12.4.1 The terrestrial ecology features relevant to the Proposed Development are summarised in Table 12-5. A precautionary approach has been taken when defining the baseline conditions.

12.4.2 Full details of the findings of desk and field studies, including evaluation of the relevant terrestrial ecological features is provided in Appendices 12C to 12J (ES Volume III, Document Ref. 6.4). These appendices should be referred to where more information is required on the grounds for scoping ecological features in and out of the impact assessment.

12.4.3 In accordance with the assessment methods summarised in Section 12.3: Assessment Methodology and provided in more detail in Appendix 12B: Ecological Impact Assessment Methods (ES Volume III, Document Ref. 6.4), relevant terrestrial ecology features are all of those considered to be of borough or higher nature conservation value, as well as features of local value where they are considered important for purposes of ensuring no net loss of biodiversity.

Table 12-5: Identification of Relevant Terrestrial Biodiversity Features Requiring Further Assessment of Impacts and Effects

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
International and National Statutory Nature Conservation Designations as first identified and screened within Appendix 12C: PEA (ES Volume III Appendices).							
North York Moors SAC	Designated for habitats including: • Northern Atlantic wet heaths with *Erica tetralix*; • European dry heaths; and • Blanket bogs.	Located 12 km south east of the PCC Site.	International, statutory protected	Appendix 12C: PEA; and Chapter 8: Air Quality.	n/r	n/r	Scoped out. The only likely impact at this distance is via emissions to air from the PCC Site. Potential for an impact from nitrogen deposition via emissions to air from the PCC Site. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of other relevant pollutants (NOx and ammonia) would not be exceeded.
Durham Coast SAC	Designated for its 'vegetated sea cliffs of the Atlantic and Baltic coasts' habitat.	Located 14.5 km north west of the PCC Site	International, statutory protected	Appendix 12C: PEA; and Chapter 8: Air Quality.	n/r	n/r	Scoped out. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.
Teesmouth and	Designated interest features potentially relevant to this	The CO_2 Export Pipeline and Water Discharge Connection overlap with the SSSI	National, statutory protected	Appendix 12C: PEA;	C, O, D	n/r	**Scoped in.** Indirect construction and/or operational impacts

[1] For the purposes of this assessment, operational and maintenance activities are considered as part of the 'Operation' category. Routine maintenance activities will be localised (largely restricted to the built footprint of the Proposed Development), small-scale and are likely to be trivial relative to the worst-case construction activities that will represent the peak in human disturbance arising from the Proposed Development. As such, if adverse disturbance effects are not predicted as a result of construction activities, then it is very likely that maintenance activities will also not be adverse.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
Cleveland Coast SSSI	chapter include nationally important saltmarsh and sand dune habitats, and a diverse assemblage of invertebrates associated with sand dune habitats. While not a designated interest feature, open mosaic habitats (OMH) are also considered given their importance to the species interest of the SSSI.	but no construction works are proposed within the SSSI. The SSSI is located 8 m north of the PCC Site.		Appendix 12H: Supplementary Habitat Information; Appendix 12I: Terrestrial Invertebrates; Chapter 8: Air Quality; Chapter 9: Hydrology and Water Resources; Chapter 13: Aquatic Ecology; Chapter 14: Marine Ecology; and Chapter 15: Ornithology.			possible as a result of changes in air quality.
Teesmouth NNR	Encompassed within the boundary of the Teesmouth and Cleveland Coast SSSI. Designated for the following features	Located 700 m north of the Natural Gas Connection Corridor and	National, statutory protected	Appendix 12C: PEA; Chapter 8: Air Quality;	O	n/r	**Scoped in**, due to the need to consider potential air quality impacts (nitrogen deposition) from

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
	relevant to this chapter: invertebrate assemblages, lyme grass moth (*Photedes elymi*), and salt marsh and sand dune plant assemblages.	CO_2 Gathering Network. The PCC Site is 2.8 km to the west.		Chapter 15: Ornithology; Chapter 18: Archaeology and Cultural Heritage; and Chapter 23: Population and Human Health.			the operation of the PCC Site, otherwise too distant and separated from construction at the PCC Site (in Redcar and Cleveland) by estuary of the River Tees. As the NNR is integral to the SSSI, the potential air quality impacts and effects are considered within the assessment provided for the SSSI as a whole.
Lovell Hill Pools SSSI	Designated for its outstanding assemblage of dragonflies and damselflies.	Located 6.3 km south-east of PCC Site.	National, statutory protected	Appendix 12C: PEA; and Chapter 8: Air Quality.	O	n/r	**Scoped in** for purposes of clarity. The assessment of operational emissions of nitrogen deposition was constrained by a

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
							lack of information on relevant critical loads (Appendix 8B, ES Volume III, Document Ref. 6.4). All other relevant pollutants would be below critical levels.
Saltburn Gill SSSI	Designated for its mixed deciduous woodland supporting a diverse ground flora.	Located 10.4 km south-east of the PCC Site.	National, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r	Scoped out. The only likely impact at this distance is via emissions to air from the PCC Site. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.
North York Moors SSSI	Designated interest features relevant to this chapter include mire, blanket bog, dry upland heath, wet upland heath and moorland habitats (the	Located 12 km south-east of the PCC Site.	National, statutory protected	Appendix 12C: PEA; and Chapter 8: Air Quality.	O	n/r	Scoped out. The only likely impact at this distance is via emissions to air from the PCC Site. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
	North York Moors contains the largest continuous tract of heather moorland in England).						nutrient nitrogen) would not be exceeded.
Durham Coast SSSI	Contains most of the para-maritime magnesian limestone vegetation in Britain. The site also contains a species-rich dune system which supports.	Located 12.7 km north-west of the PCC Site.	National, statutory protected	Appendix 12C: PEA; and Chapter 8: Air Quality.	O	n/r	Scoped out. The only likely impact at this distance is via emissions to air from the PCC Site. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.
Relevant Local Statutory and Non-Statutory Nature Conservation Designations as first identified and screened within Appendix 12C: PEA (ES Volume III, Document Ref. 6.4).							
Coatham Marsh LWS	Designated for its saltmarsh, coastal grasslands, flushes, seepages and springs.	Adjacent to Water Connection Corridor. Located 600 m east of the PCC Site.	County, non-statutory	Appendix 12C: PEA; and Chapter 8: Air Quality.	O	n/r	Scoped out. The only likely impact at this distance is via emissions to air from the PCC Site. Appendix 8B (ES Volume III, Document Ref. 6.4) has assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
							There are no proposed construction activities in proximity to the LWS. The only works adjacent to the LWS is the use of the existing Northumbrian Water pipeline as the water supply (Water Connection Corridor).
Eston Pumping Station LWS	Designated for its mosaic of habitats and borderline neutral urban grasslands.	Adjacent to the Connection Corridors. Located 1.4 km south of the PCC Site.	County, non-statutory	Appendix 12C: PEA; and Chapter 8: Air Quality.	O	n/r	Scoped out. Appendices 8A and 8B (ES Volume III, Document Ref. 6.4) have assessed and confirmed that levels/loads of relevant pollutants (NOx, ammonia and nutrient nitrogen) would not be exceeded. The only potentially relevant construction activities nearby relate to the temporary excavation of a 1.2 m deep trench for installation of connections. Otherwise use would be made of existing infrastructure (pipe racks and overhead powerlines). Accordingly, impacts on the LWS from these works are considered unlikely.
All other local designations	Various	None located within the 2 km Study Area set for the operational air quality impact assessment, none	County, statutory and/or non-statutory	Appendix 12C: PEA.	n/r	n/r	Scoped out. No pathway for impacts based on the locations of these local designations as

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
		close enough to experience construction impacts.					clarified in Appendix 12C (ES Volume III, Document Ref. 6.4).
Relevant habitats identified with reference to the information provided in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4). Local or higher value habitats only, excluding habitats that are reasons for designation of the above nature conservation designations.							
Semi-improved grassland	Mainly agricultural grasslands, road verges and rough unmanaged grasslands of secondary origin on previously developed land. Typically, of low botanical interest. Can occur in matrix with higher value OMH.	Widespread within the land required in both boroughs for the PCC Site, temporary laydown areas and below ground connections.	Up to Borough, Local Biodiversity action Plan (LBAP)	Appendix 12C: PEA.	C, D	C	**Scoped in**, potential for permanent losses and temporary habitat disturbances. Assumed that all below ground infrastructure would be left in situ at decommissioning (i.e. no new excavation).
Scrub	Scrub habitats are of recent secondary origin and readily substituted. Comprised of common species,	Occurs locally within the Site boundary on land required in both boroughs for temporary laydown areas	Local	Appendix 12C: PEA.	C, D	C	**Scoped in**, potential for permanent losses and temporary habitat disturbances. Assumed that all below ground

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
	some of planted origin.	and below ground connections.					infrastructure would be left in situ at decommissioning (i.e. no new excavation).
Coastal and floodplain grazing marsh	This habitat is defined by its hydrological and topographical characteristics rather than its botanical interest. The majority of sites have low botanical grassland interest, but nevertheless may be important for birds ((see Chapter 15: Ornithology (ES Volume I, Document Ref. 6.2)).	Very limited overlap with an area within the Site boundary required for temporary construction laydown in Stockton-on-Tees.	Up to Borough, S41, LBAP	Appendix 12C: PEA	n/r	C	**Scoped in** due to localised temporary habitat loss for temporary construction laydown. Impacts otherwise avoided through use of existing infrastructure, particularly the existing network of pipeline racks.
OMH on Previously	Intimate mixtures of grassland, ephemeral and	Within the Site boundary on land required for Natural	Borough, S41, LBAP	Appendix 12C: PEA.	n/a	C	**Scoped in**, potential for temporary habitat disturbances. Assumed that all below ground infrastructure

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
Developed Land	scrub communities. The quality of the constituent habitats and associated flora (which is determined by local substrate characteristics) is limited and relatively uniform across the Site.	Gas Connection in Stockton-on-Tees.					would be left in situ at decommissioning (i.e. no new excavation).
Relevant species - Those protected species and habitats found not to be present are not listed here. Further information is provided in Appendix 12C: PEA (ES Volume III, Document Ref. 6.4). This table excludes freshwater fish, other true aquatic species, marine species and birds (see Chapters 13, 14 and 15 respectively for these, ES Volume I, Document Ref. 6.2).							
Bats	Species and their habitats.	Utilise habitats coinciding with the PCC Site. No meaningful habitat impacts elsewhere.	Local, legally protected, S41, LBAP	Appendix 12C: PEA; and Appendix 12D: Bat Survey Report.	C, O, D	C	**Scoped in**, potential for localised impacts from habitat loss and lighting. Assumed that all below ground infrastructure would be left in situ at decommissioning (i.e. no new excavations).
Common lizard	Species and its habitat. Low population size class in vicinity of the	Residual potential for incidental use of the PCC Site.	Borough, S41, legally protected	Appendix 12C: PEA; and Appendix 12E: Reptile Survey Report.	C, D	C	**Scoped in**, small residual risk associated with vegetation clearance for the PCC Site and connection corridors requiring ground disturbance.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
	PCC Site, but no records from land required for the PCC Site.						
Controlled Weed Species	Terrestrial invasive non-native plant species subject to specific legal provisions.	Giant hogweed was found in the temporary laydown area for the PCC Site. Other species may be present at the time of construction.	No value, offence to cause to spread	Appendix 12C: PEA.	C, D	C	**Scoped in**, potential for localised disturbance and spread during construction. Assumed that all below ground infrastructure would be left in situ at decommissioning (i.e. no new excavations).
Flora	No notable species populations are known that are likely to be adversely affected by the Proposed Development.	n/r	n/r	Appendix 12C: PEA; and Appendix 12H: Supplementary Habitat Information Report for Coatham Sands	n/r	n/r	Scoped out. No notable species identified.
Great crested newt	Species and its habitat.	Potential for presence in connection corridors in Stockton-on-Tees not fully resolved. Not present in South Tees area of Redcar and Cleveland.	Up to Borough, legally protected, S41	Appendix 12C: PEA; and Appendix 12J: Great Crested Newt Screening Report.	n/r	n/r	Scoped out. No pathways for an impact on conservation status (if present) identified in Appendix 12J (ES Volume III, Document Ref. 6.4). Good practice working methods identified that close out the negligible residual risk.

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
Otter	Species and its habitat.	Potential presence along watercourses and in coastal habitats in both boroughs.	Up to Borough, legally protected, S41	Appendix 12C: PEA; and Appendix 12G: Otter and Water Vole Survey Report	n/r	n/r	Scoped out. No impacts to watercourses are anticipated. Watercourses in proximity to potential construction works in Redcar and Cleveland have been surveyed and the species was not found. No watercourses will be affected in Stockton-on-Tees where the only activities near watercourses coincide with locations of existing pipeline racks. Drill entry and exit points, should new Tees crossings be required, are set back from the banks of the river in locations subject to existing industrial usage.
Terrestrial invertebrates	The invertebrate assemblages of relevance to the Proposed Development are those that support notable species. They occur in association with flower-rich grasslands and OMH.	Only substantive habitat loss is at the PCC Site. Also anticipated within OMH disturbed for the Natural Gas Connection in	Up to county S41, LBAP	Appendix 12C: PEA; Appendix 12F: Invertebrate Survey Report; and Appendix 12I: Terrestrial Invertebrate Survey	C, D	C	**Scoped in**, potential for localised permanent and temporary habitat loss/disturbance. Assumed that all below ground infrastructure would be left in situ at decommissioning

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of the ES (Volume I or III)	Relevance to assessment of the Proposed Development (C = construction, O = operation[1], D = decommissioning, n/r = not relevant)		Summary of scoping (signposting to evidence)
					PCC Site	Connection corridors	
		Stockton-on-Tees.		Report for Coatham Sands.			(i.e. no new excavations).
Water vole	Species and its habitat.	Potential presence along watercourses and at margins of large waterbodies.	Up to County, legally protected, S41	Appendix 12C: PEA; and Appendix 12G: Otter and Water Vole Survey Report.	n/r	n/r	Scoped out. Refer to row on otter for reasoning.

Future Baseline

Construction (2022-2026)

12.4.4 The future ecological baseline expected to be present for the period of 2022-2026 is likely to be very similar to the existing baseline. It is unlikely that there would be any substantive increase in semi-natural vegetation on the Site because of the nature of the existing habitats present and existing management.

12.4.5 Semi-natural habitats in association with the Proposed Development are all currently managed to a greater or lesser degree, and this land management is unlikely to change over the short term. All existing habitats are likely to continue to be present, although some minor changes in habitat extent, composition and structure might occur as a result of ecological succession, e.g. the gradual establishment of tree and shrub seedlings within open habitats, and minor changes in the extent and distribution of ruderal vegetation as natural processes move towards grassland. Therefore, the habitats and species present are very unlikely to undergo significant change prior to the period 2022-2026.

12.4.6 Changes in the distribution of some species would be likely to occur in line with changes in habitats as a result of ecological succession or other natural processes, but over the short term any such changes would be relatively minor.

Operation (2026)

12.4.7 The future ecological baseline at the start of operation would not differ substantively from that described above for construction, but change is possible over the anticipated operational life of the Proposed Development to circa 2051 (decommissioning).

12.4.8 Based on the available information, there are no grounds to expect that there would have been any marked change in local land management practice and the habitats by the time of the commencement of operations. The short-term baseline described above for construction is equally applicable to the start of operation.

12.4.9 There are a variety of nature conservation designations in the vicinity of the Site. It is difficult to state with certainty how the nature conservation value of these designations might change over the medium to long term operational period, and this would ultimately depend on long-term management regimes. Natural England currently considers the closest SSSI unit of Teesmouth and Cleveland Coast SSSI (Coatham Sand Dunes) to be in favourable condition, but the interest features of some other units (primarily ornithology related) have been assessed as unfavourable (Natural England, 2018). Factors likely to influence (positively or negatively) the integrity and nature conservation value of designations will depend on the suitability of land management regimes, population pressures (e.g. recreational use of sand dune habitats), and over the longer term climate change and anticipated improvements in air quality as pollutants decrease due to changes in technology and the types of

emissions sources[2]. For national and international designations there will remain a legal obligation to maintain or achieve (where this is failing) favourable condition, so the condition of these designations needs to be assumed to be stable or improving over time.

12.4.10 It is likely that current and former industrial land adjacent to the Site would be released for new development, e.g. in accordance with existing local plans and policy for regeneration of the South Tees Area. The extent of ecologically valuable OMH and grassland habitats may decrease as a result of such development and therefore the relative nature conservation value of remaining areas of semi-natural habitat may therefore increase over time.

12.4.11 Counter to this, implementation of planning policy and legal requirements (including the Redcar and Cleveland South Tees Area SPD and anticipated legal requirements to deliver substantive biodiversity enhancement) should as a minimum ensure no net loss of biodiversity. Additionally, if implemented successfully as intended, it should also mean that future adjacent developments incorporate features of value for biodiversity with potential for small to moderate improvements in the future baseline over the operational life of the Proposed Development, e.g. certain species may colonise or increase in number as a result of such enhancement. Policy STDC7 of the SPD requires measures to protect and enhance the biodiversity of the South Tees area in accordance with the evolving masterplan.

12.4.12 Changes in the distribution of some species would be likely to occur in line with changes in habitats as a result of ecological succession or other natural processes, but over the short term any such changes would be relatively minor.

Decommissioning (circa 2051 – 2066+)

12.4.13 Strategic-level Climate Change Predictions (CCP), including UKCP18 (The Met Office, 2018) indicate that there is potential for sea level rise of up to 300 mm over the lifetime of the Proposed Development (see Appendix 9A: Flood Risk Assessment, ES Volume III, Document Ref. 6.4), and this may have an influence on the sensitivity of habitat and species features present at decommissioning. For example, some coastal features may be adversely affected by increased inundation or erosion, which may increase the significance of any impacts and effects arising from decommissioning. This is most likely to be relevant to marine (Chapter 14) and ornithological (Chapter 15) features. Implications for terrestrial ecology are considered minor given the scale of the predicted sea level rise and within the context of other likely changes in the future baseline.

12.4.14 The decommissioning baseline will be strongly influenced by future land-use and nature conservation regimes affecting adjacent land (as first described above under for operation baseline). The balance between adverse effects and beneficial habitat improvements is unknown. This limits the assumptions that can be made for the purposes of this assessment.

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

12.4.15 Decommissioning activities will involve removal of above ground infrastructure only and will primarily be located within the built footprint of the Proposed Development, i.e. the PCC Site, rather than within areas of vegetation. Consequently, the likely ZoI of decommissioning will be much smaller than that for the operational and construction phases especially in relation to air quality effects. Decommissioning may also proceed to different timeframes within different parts of the Site, and in particular the compressor and CO2 Gathering Network is likely to remain in operation after the PCC Site is decommissioned. Relevant ecological features will therefore depend on the location and timing of the relevant decommissioning activities, and overall will be much reduced relative to those relevant at construction and operation.

12.4.16 Decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of the Proposed Developments closure. A Decommissioning Plan (including Decommissioning Environmental Management Plan (DEMP)) will be produced and agreed with the Environment Agency as part of the Environmental Permitting and site surrender process. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. Ecological surveys will be commissioned as appropriate to inform the scope of the DEMP. This is discussed further within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2).

12.5 Development Design and Impact Avoidance

12.5.1 The design process for the Proposed Development has included consideration of biodiversity constraints and has incorporated, where reasonably practical, measures to avoid and reduce the potential for adverse effects on these, in accordance with the 'mitigation hierarchy' (see Appendix 12B: Ecological Impact Assessment Methods in ES Volume III, Document Ref. 6.4) and relevant planning policy.

12.5.2 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 or operational environmental best practice. Specifically, measures to deliver compliance with industry good practice and environmental protection legislation during both construction and operation can be assumed in accordance with NPS EN-1 paragraph 4.10.3, namely measures in relation to potential for surface and ground water pollution, fugitive dust management, and noise prevention or amelioration. It must be assumed that all measures available to regulators to secure such requirements will be properly applied and enforced by the relevant regulators. Many of the measures required in support of this are already committed as set out in Appendix 5A: Framework CEMP (ES Volume III, Document Ref. 6.4).

12.5.3 Similarly, it must be assumed that all relevant protected species legislation will be complied with, as this is mandatory. However, to assist transparency on what is required and what would be provided, likely measures required to comply with relevant protected species legislation, including attainment of

necessary licences and permits are summarised in Section 12.7: Mitigation and Enhancement Measures of this chapter.

12.5.4 The Proposed Development has avoided works within areas with terrestrial nature conservation designations, including Teesmouth and Cleveland Coast SSSI and Eston Pumping Station LWS. No construction works are required in the SSSI and while there is an overlap with the Site this reflects only use of existing infrastructure or alignment of trenchless construction routes. The LWS is adjacent to the CO_2 Gathering Network and one of the Natural Gas Connection Corridors for the Proposed Development but has been proactively excluded from the Site boundary.

12.5.5 The connection corridors have also been configured to avoid sensitive terrestrial habitats as far as possible, as are the locations proposed for temporary construction laydown. Accordingly, no losses of mature trees or woodland are anticipated. Appropriate tree root protection zones will be defined in advance of construction to avoid impacts on adjacent retained trees.

12.5.6 As far as possible, the routing of connection corridors utilises existing infrastructure, including the extensive existing network of pipeline racks available to accommodate the CO_2 Gathering Network. This approach minimises the excavations and construction activities required and therefore the potential for disturbance of species and habitats. As a direct consequence of this approach, potential impacts on biodiversity in Stockton-on-Tees have been substantively reduced and are minimal.

12.5.7 Where excavations for connections cannot be avoided, then as far as possible the relevant connections share the same construction corridor. Localised disturbances of OMH are considered acceptable given this is consistent with the origin and management needs for this habitat, as explained within the impact assessment section.

12.5.8 Permanent habitat losses associated with pipelines will also be minimised through use of existing rack systems (e.g. as already present at Saltholme and Seal Sands) and compliance with the requirements of paragraph 2.21.3 of NPS EN-4. The latter requires post-construction reinstatement of pipeline routes as close to its original state as possible (if necessary, see Section 12.6: Likely Impacts and Effects, presented for OMH for further comment on this). While this does not remove the construction impact, it does provide certainty of reinstatement of habitats back to an appropriate end condition, as well as a beneficial reduction in the duration and magnitude of the construction effect on habitats and species. A mitigation plan setting out the measures required for each relevant location/habitat is included within the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12).

12.5.9 An Environmental or Ecological Clerk of Works (ECoW) would be present during construction as appropriate to supervise and instruct implementation of impact avoidance commitments. Precautionary working methods will also be adopted to manage any residual risk of protected and invasive species being encountered so as to address residual issues associated with great crested newt and common lizard.

12.5.10 As described in Chapter 8: Air Quality (ES Volume I, Document Ref. 6.2), the final stack height for the Proposed Development has been optimised to minimise ground-level air quality impacts on relevant ecological features.

12.5.11 An Indicative Lighting Strategy (Document Ref. 5.11) has been prepared to accompany the Application to demonstrate how lighting impacts on sensitive ecological features, have been considered to date and will be as the detailed design is progressed.

12.6 Likely Impacts and Effects

12.6.1 This section describes the likely impacts and effects of the Proposed Development on relevant biodiversity features in the absence of any mitigation over and above that which is inherent to the design, or otherwise required for purposes of legislative compliance (as described in Section 12.5 of this chapter).

12.6.2 This assessment takes account of guidance on requirements for assessment given in NPS EN-1 (paragraph 4.10.3). This states: "in considering an application for development consent … focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. … work on the assumption that the relevant pollution control regime and other environmental regulatory regimes, including those on land drainage, water abstraction and biodiversity, will be properly applied and enforced by the relevant regulator." Accordingly, while it remains necessary to assess impacts and effects arising from emissions to air, this is not extended within this chapter to a more speculative assessment of potential pollution sources, given the legislation and regulatory regimes in place to allow control of this, and the mitigation otherwise committed to in Chapter 8: Air Quality and Chapter 9: Hydrology and Water Resources (ES Volume I, Document Ref. 6.2).

12.6.3 In making this assessment, regard has been given to other relevant impact assessment Chapters, specifically Chapter 8: Air Quality and Chapter 9: Hydrology and Water Resources (ES Volume I, Document Ref. 6.2). It is not considered necessary in this chapter to replicate the full detail of the impact assessments provided by these source chapters. This chapter therefore restricts its scope to the pertinent points for terrestrial ecology and biodiversity, while also signposting the relevant source assessments (indeed much of this has already been identified and considered in Table 12-5 above). Where mitigation has been identified as necessary in other chapters to address and remove potential significant adverse effects, then it can be assumed that there is a commitment to provide this mitigation, and that it would be delivered as outlined in the relevant chapter and/or as specified in the Appendix 5A: Framework CEMP (ES Volume III, Document Ref. 6.4).

12.6.4 Relevant biodiversity features are those that are considered to be of biodiversity value at a local or higher geographic level and to have potential to be affected by the Proposed Development, as summarised in Table 12-5 of this chapter.

Construction

Designations

12.6.5 There are no pathways for construction impacts on the relevant designations detailed in Table 12-5, including Teesmouth and Cleveland Coast SSSI. This has been confirmed with reference to the assessments presented in Chapter 8: Air Quality and Chapter 9: Surface Water, Flood Risk and Water Resources (ES Volume I, Document Ref. 6.2).

Habitats

12.6.6 Construction activities would result in the following impacts on habitats, which are assessed in more detail below:

- permanent losses of semi-improved grassland habitat of borough nature conservation value for the construction of the PCC Site;
- temporary losses of additional areas of semi-improved grassland and scrub of local to borough nature conservation value for temporary construction laydown and/or construction corridors; and
- disturbance of OMH habitats of borough nature conservation value for construction of the Natural Gas Connection. It is assumed for purposes of worst-case impact assessment that the impact on OMH could be detrimental. This is not certain and conversely the impact could be beneficial.

12.6.7 As explained below, no likely significant effects on terrestrial habitats are anticipated as a consequence of construction activities.

Semi-improved Grassland

Permanent and temporary losses within the PCC Site

12.6.8 Construction of the PCC Site in Redcar and Cleveland would lead to a permanent loss of up to 17.3 ha of secondary semi-improved neutral grassland. However, this grassland will be compensated within the PCC Site after construction in a manner suitable to achieve a net gain for biodiversity (see Indicative Landscape and Biodiversity Strategy, Document Ref. 5.12).

12.6.9 In addition, a worst-case 12.2 ha of secondary grassland may be lost for the temporary Teesworks Construction and Laydown area. This drought-stressed semi-improved grassland (see Target Notes 1 and 3, Appendix 12C in ES Volume III, Document Ref. 6.4) is considered to be of Borough nature conservation value.

12.6.10 Comparable grassland habitats occur extensively within the former Redcar steelworks site and in the surrounding area (as mapped in Appendix 12C, ES Volume III, Document Ref. 6.4). Consequently, the permanent loss of good quality semi-improved grassland within Redcar and Cleveland is very small and is considered ecologically meaningful at the local level only. Further, the details set out in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12) confirm that sufficient good quality new grassland will be provided within the PCC Site after construction to compensate for the grassland habitat permanently lost during construction of the PCC Site. By

doing so the Proposed Development will achieve no net loss of biodiversity, and in addition also achieve a gain for biodiversity.

12.6.11 All temporary losses of grassland for temporary construction laydown will be reinstated in accordance with the requirements of the relevant landowner (see Chapter 5, ES Volume I, Document Ref. 6.2) and this is considered sufficient to ensure no net loss of biodiversity as a result of requirements for temporary land take during construction.

12.6.12 Grassland of comparable quality to the existing baseline (of relatively species-poor and sub-optimally managed grassland) can be expected to re-establish within five years, with a net gain possible within the PCC Site within 10 years of the habitat creation.

12.6.13 The combined effect of the required permanent and temporary grassland losses within and adjacent to the PCC Site is assessed as not significant (minor adverse).

Temporary requirements for land-take from grassland habitats

12.6.14 The following additional temporary grassland losses are required as follows:

- 1.4 ha for the Saltholme Laydown and Access area, within Stockton-on-Tees. This will affect grassland mapped by Natural England as coastal and floodplain grazing marsh, a S41 habitat. This grassland is species-poor and is of biodiversity value mainly for its potential importance to birds. It is considered to be of local nature conservation value (see below);
- 9.7 ha for the Navigator Terminal Construction and Laydown area, within Stockton-on-Tees. This grassland is of semi-improved sown type and occurs over previously disturbed ground. This grassland is of species-poor semi-improved type and consequently is of up to local nature conservation value;
- 3.1 ha for the Haverton Hill Construction and Laydown area, within Stockton-on-Tees. This grassland is a mixture of species-poor semi-improved agricultural pastures and consequently is of up to local nature conservation value; and
- various small-scale temporary disturbances of improved and poor semi-improved grassland of up to local nature conservation value, primarily road verges, during construction of the buried infrastructure within the Natural Gas Connection Corridor and CO_2 Gathering Network in Redcar and Cleveland and Stockton-on-Tees, and the Water Discharge Connection to Bran Sands Waste Water Treatment Plant and the Electrical Connection to Tod Point Substation in Redcar and Cleveland. Use of existing pipeline rack systems (encompassing most of the CO_2 Gathering Network), sharing of construction corridors, and trenchless construction methods substantially reduces the need for new ground disturbance for these works.

12.6.15 While the Saltholme Laydown and Access area affects coastal and floodplain grazing marsh, the quality of the S41 habitat at this location is influenced (reduced) by its proximity to the existing Saltholme substation and the local

road network, and the relative distance from waterbodies. These factors have a strong bearing on (reduce) the structure and function of the habitat for birds. In the absence of any other features of note from a biodiversity perspective, this grassland is considered to be of local nature conservation value only. The consequences for birds are not relevant to this chapter and instead are addressed in Chapter 15: Ornithology (ES Volume I, Document Ref. 6.2).

12.6.16 In some cases, the temporary disturbances described above are likely to be ecologically beneficial, although reliance is not placed on this for the purposes of this impact assessment. This is because disturbance of grassland habitats can re-set ecological succession (which currently is moving towards rank species-poor grassland and scrub) back to a more optimal state suitable for a greater variety of plants and dependent terrestrial invertebrates. It may also reinstate areas of OMH that have been lost to establishment of rank species-poor grassland.

12.6.17 As only temporary land-take is required, the above grassland areas would be reinstated once the land is no longer needed for temporary laydown. Grasslands of the type affected (i.e. comparable to intensively managed agricultural grasslands) can be readily reinstated after completion and can be expected to re-establish within no more than two growing seasons. Enhancement of these grasslands is not proposed at the time of re-instatement as these grasslands are not within the permanent control of the Applicants, and instead would be returned to the existing landowners. Given this, there is no suitable mechanism to secure the management regimes needed to deliver enhancement.

12.6.18 While committing to the default principle that all grassland areas will need to be reinstated, consideration will be given on a case by case basis (once final construction route alignments have been selected) as to whether reinstatement is essential to meet biodiversity objectives. It may be possible to leave small areas to natural processes to provide small-scale patches of ephemeral vegetation and OMH.

12.6.19 The combined potential temporary effect on the conservation status of the above species-poor grasslands, which are of types that are common in the wider landscape, would be ecologically meaningful at the local level only and consequently is assessed as not significant (minor adverse).

Scrub

12.6.20 Establishment of the temporary Teesworks Construction and Laydown area during construction of the PCC Site in Redcar and Cleveland would lead to the permanent loss of up to 1.7 ha of dense scrub (if this vegetation is still present at the time of construction, given its proximity to demolition and site clearance works proposed by the existing landowner and subject to a separate planning application). This scrub is of relatively recent planted origin and is comprised of common plant species (Target Note 5, Appendix 12C in ES Volume III, Document Ref. 6.4). Accordingly, it has been assessed as having local nature conservation value.

12.6.21 As the Applicants do not have permanent control over the Teesworks Construction and Laydown area, no scrub replanting is proposed at the location of its original loss. Instead, new scrub plantings will be provided

within the PCC Site, as part of the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12). This Strategy allows for the integration of scrub plantings into the proposed new grassland habitats.

12.6.22 Potential land requirements during construction of the connection corridors in Redcar and Cleveland and Stockton-on-Tees may also require some localised scrub removal or pruning. Currently it is anticipated that any impact on scrub from these construction activities would be very minor, with scrub being avoided as far as practicable. Most of the scrub resource along the connection corridors is associated with the CO_2 Gathering Network, where the existing network of pipeline racks will be used to avoid a need for new land-take. Similarly, scrub also occurs along the margins of existing highways which will be used unaltered by construction traffic.

12.6.23 The extent of scrub habitat loss, all of which is comprised of a limited suite of common tree and shrub species, will be determined when construction working requirements are finalised and will be covered by measures in the final Landscape and Biodiversity Strategy to be secured and agreed as a Requirement in the DCO. In some cases, removal of dense scrub may be ecologically desirable where it allows habitats to be re-set back to an earlier state of higher nature conservation value e.g. open flower-rich grassland or OMH. This will also be considered when identifying requirements for replacement plantings.

12.6.24 Even without replacement plantings along the connection corridors, scrub can be expected to re-establish within 5 to 10-years through natural processes i.e. at a similar rate to that possible through re-planting. This is because insufficient active land management takes place within the relevant land required for the Proposed Development to prevent scrub from re-establishing.

12.6.25 The combined requirements for scrub removal will reduce the habitat resource within the Site. However, in most cases this would be temporary only as it can be readily reinstated through natural processes or (if required) new plantings. Consequently, the potential adverse effect on the conservation status of scrub habitats is ecologically meaningful at the local level only and is therefore assessed as not significant (minor adverse).

Open Mosaic Habitats on Previously Developed Land

12.6.26 OMH is a composite habitat encompassing a number of the identified Phase 1 habitat types (Appendix 12C: PEA ES Volume III, Document Ref. 6.4 Figure 12C-1), particularly patches of ephemeral/short perennial vegetation close association with patches of open and flower-rich grasslands and scrub (the last two habitats not being OMH when present in isolation). It is widespread in Redcar and Cleveland within the South Tees Area, where there are large areas of previously disturbed former industrial land, and is also widespread within the Seal Sands Industrial Complex in Stockton-on-Tees.

12.6.27 Within the Site, OMH only coincides with construction activities along the alignment of the Natural Gas Connection Corridor within the Seal Sands Industrial Complex, Stockton-on-Tees. In this area, OMH occurs along the alignment of the existing railway, and this is also the alignment chosen for the

Natural Gas Connection Corridor. The OMH present, comparable examples of which occur widely to the immediate north of the Site, is considered to be of borough nature conservation value.

12.6.28 Construction works in this area would necessitate temporary ground disturbance only and would be constrained to a corridor approximately 1.4 km long and no more than 35 m wide (approximately 5 ha, out of 308 ha mapped for wider Seal Sands). Construction would involve fencing off the works area, stripping and storing overburden, excavating a trench and storing subsoil, laying and welding pipe sections together at grade level (pipe stringing), laying pipe in the trench, re-instating drainage, and then backfilling subsoil, reinstating overburden. Given the presence of OMH, no sowing would be undertaken and instead reinstatement of vegetation would be left to natural processes. The re-establishment of vegetation consistent with OMH is likely to be well advanced within two to three growing seasons of the original construction disturbance.

12.6.29 Localised temporary construction disturbances of the type proposed are not considered adverse for OMH, as long as the habitat is allowed to re-establish (in this case through natural/ passive processes) afterwards. This is already committed to in order to comply with paragraph 2.21.13 of NPS EN-4.

12.6.30 Regular periodic but localised disturbance is essential for maintaining bare ground and early succession vegetation communities, which are the primary components of OMH. Without such disturbance, OMH is likely to be lost over time to establishment of a mature closed sward of rank grassland and dense scrub communities (as observed during the site walkovers surveys, including along the alignment of the Natural Gas Connection Corridor). Given this, the proposed construction works would not be adverse and over large sections of the route could prove beneficial for OMH and therefore desirable from a nature conservation standpoint. The main uncertainties limiting confidence in the ability of the Proposed Development to achieve a beneficial outcome for OMH relate to the final route selection for the corridor within the broadly defined Site boundary, and the suitability of the substrates underlying these areas for re-establishing OMH. Suitable substrate is well-drained with low nutrient status and little organic matter.

12.6.31 Even adopting the least favourable outcome for the purposes of precautionary assessment, the localised and short-duration temporary impact on the conservation status of OMH is not considered likely to result in an adverse effect. Therefore, the effect is assessed as not significant (neutral).

Species

12.6.32 Construction activities will result in the following impacts on species, which are assessed in more detail below:

- permanent and temporary losses of part of the habitat resource for a terrestrial invertebrate assemblage of county nature conservation value within the PCC Site;

- localised temporary disturbances affecting part of the habitat resource for terrestrial invertebrate assemblages of up to county nature conservation value within construction corridors;
- localised temporary and permanent losses of part of the habitat resource for bat populations of local nature conservation value within the PCC Site, but not of sufficient magnitude to affect wider habitat availability or accessibility; and
- potential for interaction with invasive non-native plant species, although biosecurity measures are committed to manage this risk.

12.6.33 As explained below, no likely significant effects on terrestrial species are anticipated as a consequence of construction activities.

Terrestrial Invertebrates

12.6.34 Surveys in 2018 recorded a terrestrial invertebrate assemblage of County value within and adjacent to the PCC Site in Redcar and Cleveland (see Appendix 12F: Invertebrate Survey Report, ES Volume III, Document Ref. 6.4). This assemblage was associated with open habitat features, particularly open short sward grassland, other flower-rich grassland and scrub edge habitats. No meaningful difference was found between the assemblages associated with land required for construction of the PCC Site and those of adjacent land within the Site, where there would be no permanent land take. In addition, the assemblage was considered to use habitat features similar to those present in the extensive fixed dune system of Coatham Sands immediately north of the PCC Site. Given this, the widespread presence of a comparable assemblage in other comparable grassland and ephemeral habitats within the Study Area and nearby can reasonably be assumed.

12.6.35 In this context, the permanent loss of habitats for construction of the PCC Site (as reported above under ‘semi-improved grassland’ and ‘scrub’) is not likely to impact the conservation status of an assemblage of terrestrial invertebrates that is widespread in comparable habitats in the South Tees Area.

12.6.36 The proposed creation of flower-rich grassland and scrub within the PCC Site and restoration of temporary laydown areas after construction (see Indicative Landscape and Biodiversity Strategy, Document Ref. 5.12) will re-establish comparable habitats to achieve no net habitat loss within the Site and a biodiversity net gain within the PCC Site. This new habitat will be suitable for re-colonisation by terrestrial invertebrates. The effect of the permanent and temporary losses of habitat on terrestrial invertebrates is therefore considered relatively small-scale and short duration. Therefore, it is assessed as not significant (minor adverse).

12.6.37 While specific surveys were not undertaken (as this was not considered necessary or proportionate following review of the construction requirements for the Proposed Development), existing desk study data indicates that there is potential for a terrestrial invertebrate assemblage of up to county value to occur in association with extensive OMH, grassland and scrub along and north of the Natural Gas Connection Corridor in Stockton-on-Tees. Within this area, habitat impacts will be localised and small-scale when compared

against the full extent of comparable suitable habitats for terrestrial invertebrates in this area (as described above under 'Open Mosaic Habitats on Previously Developed Land'). While localised impacts cannot be discounted, the terrestrial invertebrate assemblage will retain access to extensive comparable habitats and, given this, an adverse effect on the conservation status of the assemblage is not likely.

12.6.38 Further, terrestrial invertebrates would be able to recolonise land disturbed by construction works once vegetation has begun to re-establish. This process is likely to be well advanced within two to three growing seasons after the construction disturbance. As noted previously, construction activities could benefit OMH and this in turn would be beneficial for terrestrial invertebrates dependent on this notable habitat. The effect of this temporary habitat loss on terrestrial invertebrates is therefore considered meaningful for nature conservation only within the limits of the Natural Gas Connection Corridor i.e. a local level effect. Therefore, it is assessed as not significant (minor adverse).

Bats

12.6.39 A bat population of local nature conservation value is present in association with the PCC Site, within the borough of Redcar and Cleveland (see Appendix 12D: Bat Survey Report, ES Volume III, Document Ref. 6.4). As the majority of construction work for the PCC Site is being completed during the day, it is not anticipated that there will be any meaningful disruption to bat foraging behaviour. During spring to autumn when bats are active, the committed construction hours will largely coincide with daylight hours (7am to 7pm) when bats are in their roosts. However, there may be limited periods towards the start and end of the season when bats are active during construction hours, or at other times when some construction activities that cannot be stopped are in progress and lighting is present. Given the baseline conditions and the limited potential for lighting to coincide with periods of bat activity, it is very unlikely that construction lighting will impact bat habitat usage.

12.6.40 Furthermore, the Indicative Lighting Strategy (Document Ref. 5.11) commits the Proposed Development to minimising potential adverse lighting effects, the specification for which will be confirmed at detailed design.

12.6.41 Accordingly, an adverse effect on the conservation status of bats is not likely.

12.6.42 Based on the findings of the surveys of the PCC Site, the permanent habitat losses at this location are not considered likely to be adverse for bats. No bat roosts are present within the land required for construction. In terms of foraging habitat, losses are predominantly from exposed areas of open grassland and ephemeral/short perennial habitat. Extensive areas of comparable foraging habitat are present on adjacent land and would remain available for use by the small numbers of bats recorded during surveys (see Appendix 12D: Bat Survey Report, ES Volume III, Document Ref. 6.4).

12.6.43 No other temporary or permanent habitat impacts are predicted that would be likely to adversely affect bats. There are no construction requirements that would substantively remove bat foraging habitats or that would sever or obstruct access to such habitats.

12.6.44 There would be a negligible impact on bats and their habitats as a result of the proposed construction activities. Consequently, the effect on the conservation status of bats from temporary and permanent losses of foraging habitats is assessed as not significant (neutral).

Common Lizard

12.6.45 Surveys did not detect common lizard within the land required for construction of the PCC Site, but did find a small population of common lizard (one individual recorded following a standard programme of presence/absence survey) on adjacent land where habitat conditions are comparable to those within the PCC Site (Appendix 12E: Reptile Survey Report, ES Volume III, Document Ref. 6.4) and INCA (2019). This suggests that there is a residual risk of common lizard being present in small numbers at the time of vegetation clearance, but not sufficient likelihood of presence to make a detailed programme of mitigation mandatory.

12.6.46 Given this, good practice precautionary working methods are proposed during vegetation clearance (see mitigation), and there is sufficient suitable habitat nearby (including Coatham Sands to the north) to accommodate any common lizards displaced by or rescued during construction activities. This precautionary approach is considered sufficient to meet legal and policy requirements. Land used for construction laydown would be reinstated after construction and once established would become available for re-occupation by common lizard. Similarly an extensive and cohesive area of new grassland habitat will be created within the PCC Site (see Indicative Landscape and Biodiversity Strategy, Document Ref. 5.12) and will be suitable for colonisation by common lizard.

12.6.47 No other temporary or permanent habitat impacts are proposed that would be likely to adversely affect the conservation status of common lizard. There are no construction requirements that would substantively remove or degrade the structure and function of common lizard habitats, or that would sever or obstruct access to such habitats. Instead, all that is proposed is the use of temporary connection corridors within extensive areas of suitable habitat, for example for the Natural Gas Connection within the Seal Sands Industrial Complex in Stockton-on-Tees. The rationale applied for the PCC Site, applies to all other areas within the wider Site Boundary where habitats are potentially suitable for common lizard. Appropriate mitigation would be applied as outlined in Section 12.7: Mitigation and Enhancements Measures.

12.6.48 There would be a negligible impact on common lizards and its habitats as a result of the proposed construction activities in at the PCC Site and within the wider Site Boundary. Consequently, the effect on common lizard from construction activities in these areas is assessed as not significant (neutral). This conclusion does not remove the need for precautionary mitigation to ensure legislative and policy compliance. This is specified later in this chapter.

Controlled Weed Species

12.6.49 There is potential for seeds/propagules of the identified controlled weed species present within the land required for the Proposed Development to be disturbed and transferred to new sites as a result of construction activities.

For example, seeds/propagules could be carried on vehicles and machinery to new locations well beyond the location of the Site.

12.6.50 It is not possible to assess the consequences of this for biodiversity as the scale of effect would depend on the number of seeds/propagules dispersed, the ecology of the habitats affected, and the pre-existing status of the relevant controlled weed species in these habitats. This is not considered material to the impact assessment, as it is primarily a matter for legal compliance. It is emphasised that it is an offence under the WCA to cause controlled weed species to spread in the wild, so appropriate working practices will be put in place to deliver legal compliance. This is detailed in Appendix 5A: Framework CEMP (ES Volume III, Document Ref. 6.4) and will be included in the Final CEMP which will include a supporting Invasive Species Management Plan (ISMP).

12.6.51 In compliance with legal requirements, effective mitigation will be applied to prevent the importation, export, or spread within the Site of propagules of controlled weeds beyond the immediate construction working area occupied by these species. With such measures in place there is no potential for an impact on nature conservation from controlled weeds.

Operation

International and National Nature Conservation Designations

12.6.52 Based on the results of the operational air quality impact assessment (Appendix 8B, ES Volume III, Document Ref. 6.4), there is a need to consider potential pathways for an air quality impact from operation of the PCC Site on the following nature conservation designations:

- Teesmouth and Cleveland Coast SSSI – Natural England has been consulted and has confirmed that the potential impact is not likely to produce a significant effect on habitats and dependent species; and
- Lovell Hill Pools SSSI – further review required as air quality impact assessment was not possible, but no likely pathways for impact are identified.

12.6.53 As explained in the section below, no likely significant effects on nature conservation designations are anticipated as a consequence of operation of the PCC Site. For further detailed assessment of the operational impacts on designated sites, refer to the Habitat Regulations Assessment Report (Document Ref. 5.13).

Teesmouth and Cleveland Coast SSSI (incorporating Teesmouth NNR)

12.6.54 The air quality impact assessment (Appendix 8B: Air Quality – Operational Phase, ES Volume III, Document Ref. 6.4) identifies potential for an adverse impact from nutrient nitrogen deposition. Refer to the Habitats Regulations Assessment Report, Document Ref. 5.13.

12.6.55 Background nitrogen deposition doses received by Teesmouth and Cleveland Coast SSSI (Coatham Sands, known as Site 1000178 South Gare and Coatham Sands within the Air Pollution Information System (APIS) is currently 10.2 kg N/ha/yr. In a worst case scenario, the Proposed Development would contribute an additional 0.36 kg N/ha/yr dose to sand

dune habitats located immediately downwind of the PCC Site. This is equivalent to 3.6% of the critical load for the most sensitive type of dune system (calcareous fixed dune grassland communities, with a minimum critical load of 10 kg N/ha/yr) and therefore is at a level that cannot be regarded as insignificant based on advice issued by the Environment Agency and Natural England. Based on the isopleths produced, this dose is received by no more than 6.4 ha of the dune system, which is 3.5% of the 184 ha of dune habitat within the SSSI. A much larger area of the dune system at Coatham Sands would receive a nitrogen dose equivalent to or greater than 1.5% of the critical load i.e. 0.15 kg N/ha/yr. This load would affect an estimated 90 ha of sand dune habitat, approximately 50% of the sand dune habitat in the SSSI.

12.6.56 The identified exceedance alone is insufficient to determine the acceptability (or otherwise) of a project (Natural England, 2018). Instead, the exceedance represents a potential threat to the condition and integrity of the SSSI that should be considered further. In practice, where a designated site is already exceeding a relevant benchmark, the extent to which additional increments on nitrogen deposition would undermine this requires further consideration of whether there is credible evidence that the emissions represent a real risk. This is highly relevant here, as considered further below.

12.6.57 The background nitrogen deposition already exceeds the critical load set for this SSSI, and this exceedance is even greater once the additional large contribution from the recently consented Redcar Energy Centre has been considered. In addition, nitrogen doses were arguably much higher in the past due to Coatham Sands being located immediately downwind of the former Teesside Steelworks, including the former Redcar Blast Furnace (which was the second largest in Europe). Although historic nitrogen deposition data are not available for the full length of time over which the area has been heavily industrialised (since at least 1875), historic deposition rates are likely to have been substantially higher than they are currently. More recently, data for the SSSI in APIS identifies that nitrogen deposition over the period 2005-2013 when the former Teesside Steelworks was operational remained broadly stable at 10-11 kg N/ha/yr. Despite this assumed longstanding historic, and more recent documented, background of elevated nitrogen deposition, a sand dune system of national nature conservation importance has established and been maintained.

12.6.58 Formal condition monitoring by Natural England, which was last completed in 2010 prior to the closure of the former steelworks, confirmed that the SSSI is in ‘favourable condition’. The botanical data collected for the Proposed Development (see Appendix 12H, ES Volume III, Document Ref. 6.4), while not a formal condition survey, strongly indicates that the current condition remains favourable.

12.6.59 Given the above, while the current baseline nitrogen deposition can be considered relatively high, it will still be substantially lower than the long-term historic baseline and is otherwise consistent with what was recorded over the period 2004-2013. So, current nitrogen doses are no more likely to adversely affect the SSSI than the preceding historic dose received from the former steelworks. In this context, the predicted nitrogen dose to the SSSI from the

Proposed Development is very modest and there can be reasonable certainty that it would not undermine conservation objectives.

12.6.60 Prior planning history and precedent adds weight to the above assessment. This was established during determination of the Teesmouth CCPP DCO by the SoS and most recently this was subsequently re-agreed by Natural England during determination of the recently consented Redcar Energy Centre. A much higher exceedance was predicted (RPS, 2020) for the consented Redcar Energy Centre (equivalent to 16% of the critical load, relative to just 3.6% as a result of the Proposed Development). Following review of the air quality impact assessment submitted with the planning application for this prior development, which presented a similar rationale to that provided above, Natural England raised no objection. Therefore, the precedent set for the Redcar Energy Centre indicates (a) that the historic baseline is highly relevant and can be given weight, and (b) that if nitrogen deposition from the Redcar Energy Centre is acceptable then the relatively modest additional contribution from the Proposed Development should also not be a cause for concern.

12.6.61 Placing weight on the location and historic context of the sand dune system at Coatham Sands, it is concluded that there would be no likely significant effect on the integrity of the SSSI as a result of deposition of nutrient nitrogen.

Lovell Hill Pools SSSI

12.6.62 Lovell Hill Pools SSSI is located 6.2 km south-east of the PCC Site and is designated for its outstanding assemblage of dragonflies and damselflies. The air quality impact assessment cannot rule out a potential adverse effect on the SSSI from nutrient nitrogen because the APIS does not provide critical load data to inform air quality modelling and impact assessment.

12.6.63 Natural England has not undertaken a condition assessment of the SSSI since 2009, when it was assessed that the SSSI was in a favourable condition. This assessment notes that at the time of assessment (July 2009) the two main pools were in quite good condition but that there was no aquatic vegetation apparent. The margins of the pools were dominated by bulrush (*Typha* sp.) and rushes (*Juncus* spp.). Marginal vegetation of the type described is common in wetlands and on pond margins, including under eutrophic conditions, so such vegetation is unlikely to be sensitive to nutrient nitrogen and acid deposition.

12.6.64 In addition, for many open freshwater habitats, phosphate is the principal growth limiting nutrient rather than nitrogen, and conservation of such sites often focuses on reducing phosphate levels rather than nitrogen levels. Phosphate does not derive from the atmosphere, so there would be no deposition from operation of the Proposed Development. The importance of phosphate (relative to nitrogen deposition) in limiting the favourable condition of freshwater habitats is reflected in Natural England's '*Views About Management*' for this SSSI, which identifies that the primary issues of concern in relation to off-site land management are water quality (mainly as a result of pollution from direct discharges and also from diffuse sources resulting from land management practices like agriculture in the wider catchment) and water abstraction.

12.6.65 Given the above assessment, the Proposed Development is not considered likely to cause an air quality impact sufficient to affect the habitat quality of Lovell Hill Pools SSSI for aquatic life stages of dragonflies and damselflies. Accordingly, it is considered that there is **no potential for a significant effect** on the integrity of the SSSI or the conservation status of its assemblage of dragonflies and damselflies.

Species

12.6.66 Once operational, the Proposed Development only has potential to interact with protected species within the operational area of the PCC Site. Air quality emissions from the operation of the Proposed Development would not adversely impact important habitats or designated sites (as reported above), there is therefore no pathway for emissions to impact on protected species (refer to Habitats Regulations Assessment Report, Document Ref. 5.13). Maintenance activities elsewhere across the Proposed Development would only occur occasionally and would be of relatively low magnitude. Given this, no likely adverse significant effects from routine maintenance activities are anticipated.

12.6.67 In this context, the only relevant species are considered to be bats, and the only potential impact pathway is through operational external lighting. No likely significant effects on bats from lighting are anticipated for the reasons given in paragraphs 12.6.68 to 12.6.71.

Bats

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

12.6.69 At the location of the PCC Site, surveys recorded only low levels of activity by common bat species (mainly common pipistrelle, but also soprano pipistrelle and noctule). The PCC Site is therefore assessed as having local nature conservation value for bats. The species recorded comprised those more tolerant to artificial lighting. The low bat activity recorded is considered a function of a number of factors, particularly the exposed coastal setting, the relatively poor quality and structure of habitats for bats within the PCC Site, and the extensive availability of comparable or higher quality habitats (including watercourses, coastal wetlands and areas with trees and scrub) in the wider surrounding landscape that are likely to be of equal or greater attractant value to bats. The Site is also an existing industrial site, so is already subject to operational lighting and this is also likely to have influenced the levels of bat activity recorded in association with the PCC Site.

12.6.70 Given the existing baseline, external lighting of the PCC is not likely to affect the conservation status of any bat species. A commitment has been made within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2) to provide a sensitive external lighting scheme taking account of a range of

considerations including requirements of nocturnal species like bats as outlined within the Indicative Lighting Strategy (see Document Ref. 5.11).

12.6.71 Given the existing baseline conditions, the effect on bats from external lighting required for operation of the Proposed Development is assessed as not significant (neutral).

Decommissioning

12.6.72 The potential for adverse decommissioning impacts and effects on relevant terrestrial ecology features is limited by the nature of the proposed decommissioning activities. It is assumed that decommissioning will remove all above ground infrastructure and that buried pipelines etc will be left in situ. Therefore, there will be no requirement to remove or disturb habitats to remove buried infrastructure, and no species associated with these habitats will be affected.

12.6.73 Requirements to remove above ground infrastructure means that decommissioning activities will be predominantly restricted to within the built footprint of the Proposed Development. Therefore, in most cases decommissioning activities will be able to avoid vegetated areas or otherwise would only affect localised areas of vegetation immediately adjacent to built infrastructure. This will limit the potential for impacts and effects on relevant habitats and species, especially in comparison with the construction phase where habitats needed to be cleared to create space to construct the Proposed Development. Where vegetation is affected it is most likely to be soft landscaping planted or otherwise managed within the built layout of the PCC Site. Some of this vegetation could have established a biodiversity value that would need to be addressed and managed appropriately during decommissioning in accordance with planning policy and legislation at that time. The relevant ecological features at the time of decommissioning cannot be identified with confidence at this time, given decommissioning would be undertaken circa 50 years after survey work to establish the pre-construction baseline conditions as reported in this chapter.

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

12.6.75 Decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of closure of the Proposed Development. A DEMP will be produced and agreed with the Environment Agency as part of the Environmental Permitting and site surrender process. The DEMP will consider in detail all potential environmental risks and contain guidance on how risks can be removed, mitigated or managed. Ecological surveys will be commissioned as appropriate to inform the scope of the DEMP. This is discussed further within Chapter 4: Proposed Development (ES Volume I, Document Ref. 6.2). The DEMP will be secured by a Requirement in the DCO.

12.6.76 On this basis, there are no likely significant effects on terrestrial ecology anticipated as a result of the decommissioning phase of the Proposed Development.

12.7 Mitigation and Enhancement Measures

Construction Mitigation

Habitats

12.7.1 Reinstatement of habitats subject to temporary disturbances during construction will be provided, as required by paragraph 2.21.13 of NPS EN-4 and other relevant planning policy, in accordance with the approach set out in Chapter 5: Construction Programme and Management, (ES Volume I, Document Ref. 6.2). The high level measures likely to be required are also described in the Indicative Landscape and Biodiversity Strategy (Document Ref. 5.12).

12.7.2 In specifying final requirements for re-instatement of land, consideration would be given to requirements of landowners, the baseline habitat conditions, and priorities for nature conservation on a location by location basis (including opportunities to secure enhancement). For example, grassland and scrub habitats may not need to be sown or planted if this can be left to natural processes and if it would provide a beneficial opportunity to re-establish OMH in the interim.

Bats

12.7.3 It is currently anticipated that the Applicants will inherit a site that has been cleared of existing buildings and structures by the existing landowner prior to handover.

12.7.4 Should the Applicants be required to demolish any buildings to permit construction of the Proposed Development then the relevant buildings will be reassessed for their suitability for use by roosting bats prior to demolition (the pre-application surveys reported in Appendix 12D, ES Volume III, Document Ref. 6.4, did not find evidence of bat roosts). This assessment, and any follow-on survey requirements to determine presence/absence of bat roosts, would be made by appropriately experienced ecologists at an appropriate time prior to commencement of demolition planning.

12.7.5 If bat roosts are found through the above work, then a Bat Low Impact Class Licence or a European Protected Species Mitigation Licence (depending on the magnitude of the bat constraint identified) would be applied for from Natural England to permit demolition works to proceed. Demolition would only proceed once all necessary licences were in place, and associated mitigation requirements (e.g. provision of replacement roosts) have been met.

Common lizard

12.7.6 While common lizard was not recorded during surveys of the PCC Site, it is considered that there remains a low residual risk of common lizard being present at construction. This residual risk justifies adoption of precautionary

working methods. The following general measures would be provided to address this:

- a tool box talk would be given to clarify the legal protections afforded and to reinforce the role of the ECoW in leading on the measures required to deliver compliance with the relevant legislation;
- arisings from vegetation clearance and construction material will not be stored in a manner that might risk them being used as a place of refuge by common lizard. The ECoW will confirm requirements for risk avoidance once working areas are defined;
- construction working areas will be appraised by the ECoW for their potential to support common lizard and working requirements advised case by case;
- vegetation disturbance and removal will be undertaken from mid-April to October to coincide with the period when common lizard is likely to be active and able to disperse away from works areas;
- removal of areas of suitable dense vegetation will involve incremental strimming to allow opportunity to find and displace/capture any common lizards present;
- any common lizards found within construction areas will be removed by an ecologist to a nearby place of safety outside construction areas. The ECoW will attend site prepared for the potential for these species to occur, and will have a suitable means to transport any reptiles found (e.g. bucket with sealable lid); and
- a record will be kept on the numbers and locations of reptiles found during the restoration works.

General Animal Welfare during Construction

12.7.7 Construction excavations have the potential to trap wildlife and may result in offences under animal welfare legislation (as listed in Appendix 12A in ES Volume III, Document Ref. 6.4). All excavations associated with both the PCC Site and the connection corridors would be covered overnight, or where this is not practicable, a means of escape would be fitted e.g. battered soil slope or scaffold plank, to provide an escape route should any animals stray into the construction site and fall into an excavation.

Invasive Species Management

12.7.8 An invasive non-native plant survey will be undertaken prior to construction to re-determine the current location and extent of invasive plant stands and, based on this, confirm the need for and detail of the ISMP. If required, the ISMP will be prepared to accompany the Final CEMP and would be agreed with relevant stakeholders. The ISMP will specify the measures and supervision necessary during construction to prevent the spread of the relevant controlled weed species to new locations.

Operation Mitigation

12.7.9 Given the findings of the above impact assessment, mitigation measures are not considered necessary during operation of the Proposed Development.

Compliance with relevant permits (to be agreed with relevant regulators post-consent) and Requirements as set out in the draft DCO, will be sufficient to manage the potential for adverse environmental and ecological effects.

Decommissioning Mitigation

12.7.10 Any necessary mitigation requirements would be determined and agreed at a future date prior to decommissioning. As part of this process, the Applicants would provide a DEMP. Relevant habitat and protected species surveys would be undertaken to inform the specification of relevant working methods and mitigation in the DEMP. This is discussed further within Chapter 4: Proposed Development (ES Volume I, Document Ref 6.2).

Enhancement

12.7.11 An Indicative Landscape and Biodiversity Strategy has been prepared and submitted with the Application (Document Ref. 5.12). This sets out the approach to site appropriate landscape and biodiversity mitigation and enhancement. It also confirms that the proposed enhancement measures are suitable to achieve no net loss and a gain in biodiversity within the PCC Site.

12.7.12 The committed biodiversity enhancement measures that comprise the majority of the Strategy and that have relevance to this chapter are:

- Extensive creation and favourable aftercare of species-rich native grassland suitable to compensate for losses at construction and achieve a net gain for biodiversity.
- Provision of scattered native scrub within the proposed grassland areas to further enhance the grassland and its associated biodiversity value.
- Provision of a stormwater attenuation pond or wetland (depending on reliability of water supply and further design considerations) which will be designed to .achieve ancillary gains for biodiversity.

12.7.13 While not a formal part of the Indicative Strategy it is also identified that should ornamental plantings be proposed as part of the final design, e.g. within car parks and around reception buildings, then these can also be specified to provide benefits for biodiversity. Any such provision of additional biodiversity enhancement features will be detailed in the final Strategy to be agreed later during discharge of the relevant Requirement in the draft DCO.

Ecological Monitoring

12.7.14 The measures proposed to avoid and reduce, where possible, significant adverse effects on ecological features are set out above. Monitoring requirements to track compliance with these commitments during the construction phase will be set out in the Final CEMP. In particular, an ECoW would be employed to oversee the delivery of all necessary mitigation, including precautionary working methods for common lizard and compliance with the ISMP.

12.7.15 Habitat monitoring may also be needed for a defined period during operation to measure and confirm successful establishment and management of the committed measures. The need for such monitoring will depend on the final selection of construction locations and methods, and therefore this will be

detailed in the final Landscape and Biodiversity Strategy which will be agreed later during discharge of the relevant Requirement in the DCO.

12.8 Limitations or Difficulties

12.8.1 Baseline conditions and relevant ecological features have been determined using appropriate methods. All habitats and species have been valued in accordance with the precautionary principle, i.e. the maximum likely nature conservation value has been applied based on the information available to inform decision-making on this.

12.8.2 For the purposes of worst-case assessment and pending further information on the layout of the PCC Site and temporary construction laydown areas, it has been assumed that all semi-natural habitats present in these areas would be lost during construction. The only exceptions to this are where clarifications have been provided. For example, it has been confirmed that all woodlands present in temporary construction laydown areas will be retained.

12.8.3 In contrast, the connection corridors have been broadly defined to allow flexibility on the selection of final connection routes and methods. In almost all cases, final construction corridors will be of no greater than 35 m width, so consequently would be much narrower than the land allowed for within the Site boundary. Therefore, it is not reasonable to assume that all habitats within the construction corridors would be lost, but it is necessary to assume that any habitats located within these corridors might be affected, except where committed otherwise through use of existing pipeline racks to prevent new land take, as is the case for most of the CO_2 Gathering Network. The parameters for this are defined in Chapter 4: Proposed Development and Chapter 5: Construction Programme and Management (ES Volume I, Document Ref. 6.2), and the Figures associated with these chapters (ES Volume II, Document Ref 6.3). In most cases, habitat losses and disturbance would be temporary, with appropriate habitat reinstatement at the end of construction to meet good practice and requirements of planning policy.

12.8.4 Where the assessment of impacts from the construction/operation of the Proposed Development is subject to worst-case assumptions or is subject to limitations associated with ongoing modelling or ground investigations, this has been made clear in the text in the relevant sections of this chapter.

12.9 Cumulative Effects

12.9.1 Potential pathways for a cumulative effect relate to:

- Operational air quality impacts from the PCC Site and other developments on important habitats (nature conservation designations); and
- Combined losses of terrestrial habitats within the South Tees Area due to construction of the PCC Site and surrounding developments.

12.9.2 No other relevant pathways are identified that are likely to produce a significant cumulative effect on the ecological features covered by this chapter.

12.9.3 The air quality impact assessment informing this EcIA has considered a baseline encompassing existing operational developments. However, several additional schemes have been identified that are not addressed in this assessment. The potential for these additional schemes to have a cumulative operational air quality effect on nature conservation designations has therefore been assessed (see Appendix 8B, ES Volume III, Document Ref 6.4). This assessment confirms no cumulative effect from emissions of NOx, ammonia and acid deposition.

12.9.4 The air quality impact assessment identifies potential for a cumulative effect from deposition of nutrient nitrogen on the relevant habitats of Teesmouth and Cleveland Coast SSSI. However, the assessment presented in Section 12.6 for the Proposed Development in isolation is equally relevant and applicable to consideration of the potential cumulative effect. The historic baseline nitrogen dose to the SSSI prior to closure of the former Redcar Steelworks can be assumed to be very high but this did not prevent the establishment and maintenance of nationally important sand dune habitats within the SSSI. Given this, the much lower cumulative nitrogen dose received from other developments following closure of the former steelworks should also not conflict with the conservation objectives set for the SSSI. Put simply, the beneficial impact on background air quality from closure of the former steelworks outweighs the comparatively small exceedance of emissions by the Proposed Development in combination with other developments. This principle was established previously during determination of the Teesmouth CCPP DCO by the SoS and was subsequently re-agreed by Natural England during determination of the recently consented Redcar Energy Centre. So, given the comparably low additional nitrogen dose from the Proposed Development, it is reasonable to rely on this established principle here. Therefore, the cumulative air quality effect is assessed as not significant.

12.9.5 The only other potential pathway for a potentially significant cumulative effect is through habitat loss and land-take for the Proposed Development and other schemes within the former Redcar Steelworks. The landowner (South Tees Development Corporation (STDC)) is advancing a number of schemes that would affect land adjacent to and surrounding the Proposed Development. The combined area of land encompassed by these schemes is much larger than the land permanently required for the Proposed Development. The contribution of the Proposed Development to the combined effect is therefore relatively small, and it is possible to achieve sufficient habitat compensation within the PCC Site to fully compensate for the permanent habitat losses at construction of the PCC Site and an additional biodiversity gain (see Section 12.7).

12.9.6 The proposed new habitats are consistent with the existing baseline conditions and are suitable to sustain the terrestrial species recorded using the PCC Site (bats and terrestrial invertebrates). The Proposed Development is therefore compliant with planning policy for the South Tees Area (see Appendix 12A, ES Volume III, Document Ref. 6.4) requiring no net loss and enhancement of biodiversity. Given this, the Proposed Development will not contribute to biodiversity losses from other development proposals in the local area. It is noted that these third-party developments are similarly

committed to achieving no net loss in accordance with the Teesworks masterplan. No adverse cumulative effects are therefore predicted for habitats or terrestrial species.

12.10 Residual Effects and Conclusions

12.10.1 With implementation of appropriate mitigation and monitoring, following discussion and agreement with relevant stakeholders, there would be no likely significant effects on terrestrial ecology.

12.10.2 No terrestrial ecological features are likely to experience adverse residual effects as a result of construction, operation and decommissioning of the Proposed Development.

12.10.3 Proposals suitable to achieve benefits for biodiversity as a direct consequence of the Proposed Development are described and demonstrated within the Indicative Landscape and Biodiversity Strategy submitted with the Application (Document Ref. 5.12).

12.11 References

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

Countryside and Rights of Way Act 2000 (as amended) (c. 37). London: The Stationery Office.

Department for Environment, Food and Rural Affairs (Defra) (2011). *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* [Online]. Version 1. published August 2011, revised December 2019. Available from: https://www.gov.uk/government/statistics/england-biodiversity-indicators.

Department for Environment, Food and Rural Affairs (Defra) (n.d.). *Multi-Agency Geographic Information for the Countryside (MAGIC)* [Online]. Available from: https://magic.defra.gov.uk/MagicMap.aspx.

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

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

Department of Energy and Climate Change (2011). *National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4).* London: The Stationery Office.

INCA (2019). *Reptile Mitigation Strategy Report* ID INCA 201931. Redcar: INCA.

Institute of Air Quality Management (2020). *A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites, Version 1.1*

[Online]. Available from: https://iagm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf.

Ministry of Housing, Communities and Local Government (2019). *National Planning Policy Framework.* London: Her Majesty's Stationery Office.

Natural England (2013). *Tees Lowlands Natural Character Area Profile* [Online]. Available from: http://publications.naturalengland.org.uk/publication/9860030?category=587130.

Natural England (2018). *Teesmouth and Cleveland Coast SSSI, Supporting Information, A supplement to the notification document* [Online]. Available from: https://consult.defra.gov.uk/natural-england-marine/teesmouth-and-cleveland-coast-potential-sp/supporting_documents/Teesmouth%20and%20Cleveland%20Coast%20SSSI%20%20Supporting%20information.pdf.

Natural England and Defra (2016). *Protected species: how to review planning applications* [Online]. Available from: https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications.

Natural England (2016) *Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance*. Natural England Commissioned Reports, Number 210.

Natural Environment and Rural Communities Act 2006 (c. 16). London: The Stationery Office.

Planning Inspectorate (2012*). Advice Note 9: Rochdale Envelope. Version 2,* republished April 2012. Bristol: The Planning Inspectorate.

Protection of Badgers Act 1992 (c. 51). London: The Stationery Office.

Redcar and Cleveland Borough Council (2018) *Redcar and Cleveland Local Plan. Published May 2018* [Online]. Available from: https://www.redcar-cleveland.gov.uk/resident/planning-and-building/strategic%20planning/Documents/Local%20Plan%20Adopted%20May%202018.pdf

RPS (2020) *Redcar Energy Centre Environmental Statement Appendix 7.3: Habitats Regulations Assessment*. Report prepared for Redcar Holdings Limited.

Stockton-on-Tees Borough Council (2019) *Stockton-on-Tees Local Plan* [Online]. Published January 2019. Available from: https://www.stockton.gov.uk/media/1585775/localplanmainreportcontents.pdf.

Tees Valley Joint Strategy Unit (2008) *Tees Valley Green Infrastructure Strategy* [Online]. Available from: https://www.middlesbrough.gov.uk/sites/default/files/PlanLib-TV_Green_Infrastructure_Strategy.pdf.

The Conservation of Habitats and Species Regulations 2017 (as amended) (SI 2017/1072). London: The Stationery Office.

The Hedgerow Regulations 1997 (SI 1997/1160). London: The Stationery Office.

The Met Office (2018). *UK Climate Projections (UKCP) User Interface* [Online] Available at: https://ukclimateprojections-ui.metoffice.gov.uk/ [Accessed: 10/12/2019].

UK Centre for Ecology and Hydrology (2016) *Understanding sand dunes* [Online]. Available from: https://www.ceh.ac.uk/our-science/projects/sand-dunes.

Wildlife and Countryside Act 1981 (as amended) (c. 69). London: The Stationery Office.