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12. Terrestrial Ecology and Nature Conservation

12.1 Introduction

12.1.1 This chapter of the Preliminary Environmental Information (PEI) Report 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).

12.1.2 As the design of the Proposed Development is currently being developed, the process of gathering information and identifying how the environment might be affected by the Scheme is still underway. The information contained within this chapter is therefore preliminary and may be subject to change prior to the production of the full Environmental Statement (ES) which will accompany the DCO application.

12.1.3 The chapter excludes assessment of potential impacts and effects on geological designations and notable geological features (see Chapter 10: Geology, Hydrogeology and Land Contamination), freshwater ecology (see Chapter 13: Aquatic Ecology), marine ecology (see Chapter 14: Marine Ecology and Nature Conservation) and birds (see Chapter 15: Ornithology) (all PEI Report, Volume I).

12.1.4 This chapter is supported by the following technical appendices, provided in (PEI Report, Volume III):

- Appendix 12A: Legislation and Planning Policy;
- Appendix 12B: Ecological Impact Assessment Methods;
- Appendix 12C: Preliminary Ecological Appraisal Report STDC site;
- Appendix 12D: Bat Survey Report;
- Appendix 12E: Reptile Survey Report;
- Appendix 12F: Invertebrate Survey Report;
- Appendix 12G: Water Vole and Otter Survey Report; and
- Appendix 15D: Draft Habitats Regulations Assessment Report.

12.2 Legislation and Planning Policy Context

Legislation

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

- 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; and
- Environmental Protection Act 1990.

12.2.2 Further information on this legislation is provided in Appendix 12A: Legislation and Planning Policy (PEI Report, Volume III).

Planning Policy

12.2.3 The Government's policy for delivery of major energy infrastructure is set out in the following relevant 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 or geological 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 [integral] 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 10 June 2019) are also important and relevant matters. The NPPF sets out the Government's planning policies for England and how these are to be applied, and identifies overarching objectives, including environmental (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 (PEI Report, Volume I).

12.2.6 The Proposed Development includes infrastructure located within the administrative boundaries of Redcar and Cleveland Borough Council and in Stockton on Tees Borough Council. Therefore, the following local planning policies are potentially 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 which 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 which 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 Proposed Development 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: how to review planning applications (Natural England and Defra, 2016);
- 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 (PEI Report, Volume III).

Use of the Rochdale Envelope

12.2.9 In accordance with the Planning Inspectorate (PINS) Advice Note 9 (PINS, 2018), the ES will present 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.

12.2.10 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 the existing infrastructure are ongoing and so for the purpose of this PEI Report, the reasonable worst-case scenario has been assumed. Further information

can be found in Chapter 5: Construction Programme and Management (PEI Report, Volume I).

12.3 Assessment Methodology and Significance Criteria

Impact Assessment and Significance Criteria

12.3.1 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.

12.3.2 The EcIA detailed in this chapter has been undertaken in accordance with best practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2019). Full details of the approach applied are provided in Appendix 12B: Ecological Impact Assessment Methods (PEI Report, Volume III), with an abridged over-view 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 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.

12.3.3 The principal steps involved in the CIEEM approach 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.

12.3.4 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'. CIEEM (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 e.g. by avoiding impacts to ponds and watercourse regardless of whether protected species have recorded.

12.3.5 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 CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (North East);
- County (North Riding of Yorkshire, County Durham);
- Borough (Redcar and Cleveland/ Stockton-on-Tees);
- 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).

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

- Impact – actions resulting in changes to 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.

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

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

12.3.8 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.

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

12.3.10 The CIEEM approach described in Appendix 12B: Ecological Impact Assessment Methods (PEI Report, Volume III) broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology (PEI Report, Volume I). However, the matrix has not been used to classify effects as this would deviate from CIEEM guidance. In order to provide consistency of terminology in the final assessment, the findings of the CIEEM assessment have been translated into the classification of effects scale used in other chapters of the PEI Report as outlined in Table 12-1. The category of 'Negligible' effects, defined in Chapter 2: Assessment Methodology (PEI Report, Volume I) as an "*imperceptible effect to an environmental resource or receptor*", is analogous to the category of 'Neutral' as set out below.

Table 12-1: Relationship Between CIEEM Assessment Terms and those Used in Other PEI Report Chapters

CIEEM assessment terms	Equivalent terminology used in other PEI Report chapters	
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

Extent of Study Area

12.3.11 The study areas used in this assessment were defined with reference to the likely Zone of Influence (ZoI) over which the Proposed Development may have potential to result in significant effects on relevant ecological features, but also with regard to the precautionary principle to ensure sufficient data was gathered to meet worst case needs for impact assessment and ongoing design iterations. These ZoI are feature specific, for example the ZoI for

assessment of potential impacts and effects on reptiles is much less than that for assessment of air quality impacts and effects on nature conservation designations. The feature specific ZoI is identified in the relevant appendices to this chapter within the relevant method statements.

12.3.12 It is important to recognise that the potential ZoI of the Proposed Development may vary over time (e.g. the construction zone of influence may differ from the operational zone of influence, particularly when considering potential air quality impacts and effects) and/ or depending on the individual sensitivities of different ecological features. This has been taken into account in the impact assessment.

12.3.13 The boundary for the Site and methods of construction are subject to ongoing refinement. The final ZoI for the Proposed Development will consider this but for the purposes of the PEI Report, a precautionary approach has been taken to assessing the distance at which potential impacts on ecological features could occur. This takes account of the sensitivity and importance of known features and the level of protection provided by national and international legislation.

Sources of Information

12.3.14 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-12G (PEI Report, Volume III). The approach to baseline development, field surveys and the wider EcIA has been discussed with Natural England and other relevant stakeholders throughout the EIA to-date.

Desk Study

12.3.15 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: Preliminary Ecological Appraisal (PEA) Report (PEI Report, Volume III).

12.3.16 Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the WCA; Schedules 2, and 5 of The Habitat 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 CIEEM (2019) guidance and relevant planning policy.

12.3.17 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. Requirements for the control of such weeds 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

Ecological Feature	Study Area	Data Sources
Multi-Agency Geographic Information for the Countryside (MAGIC) website https://magic.defra.gov.uk/	January 2020	• International and national statutory nature conservation designations within 15 km of the proposed 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/	January 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	January 2020	• Citations for national nature conservation designations: Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) • Details on Local Nature Reserves (LNR)
Environmental Records and Information Centre (ERIC) North-East	March 2018, updated July 2019	• 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	January 2020	• Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of

Ecological Feature	Study Area	Data Sources
		planning policy and assessment of potential protected and notable species constraints.
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*). 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

12.3.18 The scope of works for necessary habitat and protected species surveys was determined through an initial programme (as access became available) of Phase 1 Habitat survey and PEA as described in Appendix 12C: Preliminary Ecological Appraisal Report (PEI Report, Volume III).

12.3.19 The field surveys undertaken to inform the EcIA are summarised in Table 12-3 below. Full details of the scope and methodology for each survey are provided in the relevant technical appendices, which are cross referenced in Table 12-3 as appropriate.

12.3.20 The scope of field surveys undertaken thus far to inform the EcIA is summarised in Table 12-3. Whilst an initial suite of surveys has been undertaken to establish the baseline habitat conditions and potential species constraints, additional terrestrial ecology surveys have been programmed to help refine the impact assessment further. Further information on this is provided in Appendix 12C: Preliminary Ecological Appraisal Report, PEI Report, Volume III).

12.3.21 The outbreak of the coronavirus (COVID-19) pandemic in spring 2020 and the subsequent government advice regarding workplace health and safety requirements has influenced the scope and approach to the ecological surveys planned for 2020. This approach is seen to be consistent with the advice provided by Natural England within their ‘Guidance on implications for Natural England’s development management advice’ (Natural England, 2020). This approach was also discussed on a site-specific basis and

confirmed with Natural England throughout April 2020. A revised plan to undertake targeted surveys was finalised in May 2020 commencing soon after.

12.3.22 Full details of the scope and methodology for each survey will be provided in the relevant technical appendices submitted with the final ES. As part of this any associated survey limitations, including any limitations arising from the coronavirus pandemic, will be identified and reviewed. The terrestrial ecology surveys completed to date are listed in Table 12-3.

12.3.23 Although further surveys are in the process of being undertaken, an appropriately precautionary ecological baseline relevant to the Proposed Development could still be determined at this stage. Information and rationale for surveys scoped out is provided in Appendix 12C: Preliminary Ecological Appraisal Report (PEI Report, Volume III).

Table 12-3: Ecological Field Surveys Completed to Date

Ecological survey	Technical appendix (PEI Report, Volume III)	Survey scope
Preliminary Ecological Appraisal	12C	Proposed Development Site.
Habitat survey	12C	Proposed Development Site, within limits of agreed land access. Supplementary data provided by INCA to address cover gaps in land access. To be updated in 2020 as further land access is agreed.
Preliminary bat roost assessment (buildings and trees)	12D	Seven structures within PCC Site and adjacent land surveyed.
Bat activity survey (walked transects)	12D	Within PCC Site and adjacent land as this is the focus of the permanent land take. To be updated in 2020 with data for adjacent land within Teesmouth and Cleveland Coast SSSI.
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 survey (Habitat Suitability Index and eDNA)	12C	Four ponds within the PCC Site and adjacent land. To be updated in 2020 with data for the Seal Sands area.
Reptile survey	12E	Within PCC Site and adjacent land as this is the focus of the permanent land take. To be updated in 2020 with data for adjacent land within Teesmouth and Cleveland Coast SSSI.
Terrestrial invertebrate survey	12F	Within PCC Site and adjacent land as this is the focus of the permanent land take. To be updated in 2020 with data for adjacent land within Teesmouth and Cleveland Coast SSSI.

12.4 Consultation

12.4.1 Pre-application engagement has been ongoing with Natural England since 2017, as 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); and
- February 2020 (Pre-Application engagement meeting).

12.4.2 An EIA Scoping Opinion was received from the Planning Inspectorate in April 2019. A summary of how comments have been considered and actioned is provided below in Table 12-4.

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, which now form part of the relevant designations, have been fully considered within the EIA. Aspects of the extended designations which are of relevance to terrestrial ecology are considered within this chapter and the supporting Appendix 12C: Preliminary Ecological Appraisal Report (PEI Report, Volume III). Chapter 15: Ornithology (PEI Report, Volume I) assesses impacts and effects on the bird features of these designations.
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 is ongoing and is reported in Chapter 8: Air Quality (PEI Report, Volume I) and supporting Appendices (PEI Report, Volume III). The outcome of this process will be presented in the final ES. The preliminary findings of the assessment are presented within this chapter.
National and Local designations, PINS Scoping Opinion p 32	All relevant local and national nature reserves have now been identified, with further information

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
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.	contained within Appendix 12C: Preliminary Ecological Appraisal Report (PEI Report, Volume III).
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. 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: Preliminary Ecological Appraisal Report (PEI Report, Volume III). In some limited areas, specific land parcels have been inaccessible (largely, this has been due to access or health and safety reasons, including coronavirus restrictions). In these limited instances, observation and inspection from nearby viewpoints has been used to inform this PEI Report (consistent with Phase 1 habitat survey methods). Survey data has also been supplemented with third party data received from INCA. The coverage of the species surveys is seen as sufficient to support a robust precautionary assessment of likely significant effects however engagement with relevant stakeholders continues. As noted above, ongoing targeted surveys will be undertaken in 2020 to further refine the baseline and will be reported within the ES.
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.	The clarification is noted; this chapter considers the CIEEM 2019 updates.
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 as Chapter 8: Air Quality (PEI Report, Volume I) and supporting appendices which assess the impacts of emissions associated with both construction and operation (PEI Report, Volume III). The findings of these assessments have informed the assessment of effects on nature conservation designations within this chapter.
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).	This will be quantified within the final ES.

Key Issue Raised / By Whom / Page No.	Response and Action, if appropriate
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) have been recorded as encountered during habitat and botanical surveys. Mitigation will be specified as appropriate within the final ES.
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 all habitats will be provided in the final ES.
Supporting data and consultation, Natural England (meeting held 3rd 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 MOU between the EA, NE, MMO and INCA as well as the local authorities and 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 ASAP and shared with NE to agree the need and nature of further survey work. INCA should also be consulted.	All advice provided will be taken into account during the ongoing baseline data gathering process and the impact assessments and associated content presented within the final ES. Habitat survey work is ongoing as land access becomes available and within the constraints imposed by the coronavirus pandemic. Third party data has been obtained from INCA to support provision of a complete habitat baseline.

12.5 Baseline Conditions

Existing Baseline

12.5.1 The terrestrial ecology features (excluding birds and ornithological designations) relevant to the Proposed Development are summarised in this section (Table 12-6). A precautionary approach has been taken when defining the baseline conditions, given not all surveys have been completed. This will be subject to review and update as further information becomes available.

12.5.2 Full details of the findings of desk and field studies, including evaluation of the relevant terrestrial ecological features is provided in Appendices 12C to 12G (PEI Report, Volume III). 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

12.5.3 In accordance with the assessment methods summarised in Section 12.3 and provided in more detail in Appendix 12B: Ecological Impact Assessment Methods (PEI Report, Volume III), relevant terrestrial ecology features are those considered to be of district or higher nature conservation value as well as features of local value only but that are important for purposes of ensuring no net loss of biodiversity.

Table 12-5: Summary 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 this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
International and National Statutory Nature Conservation Designations						
North York Moors SAC	Designated for habitats including: • Northern Atlantic wet heaths with *Erica tetralix*; • European dry heaths; and • Blanket bogs.	Located 11.9 km south east of the PCC.	International, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r
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	International, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r
Teesmouth and Cleveland Coast SSSI	Designated for a variety of terrestrial, marine and ornithological features. Designated interest features potentially relevant to this chapter include nationally important saltmarsh and sand dune habitats, and a diverse assemblage of invertebrates associated with sand dune habitats.	Proposed On-shore CO_2 Export and Water Discharge Corridors are located within the SSSI. The SSSI is located 8 m the north of the PCC.	National, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality Chapter 9: Hydrology and Water Resources Chapter 13: Aquatic Ecology Chapter 14: Marine Ecology Chapter 15: Ornithology	C, O	C
Teesmouth NNR	Designated for the following features relevant to this chapter: invertebrate assemblages, lyme grass moth (*Photedes elymi*), and salt	Located 400 m north of the Gas Connection Corridor and CO_2 Gathering	National, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality Chapter 15: Ornithology	O	n/r

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
	marsh and sand dune plant assemblages. It is also designated for its ornithological features (see Chapter 15: Ornithology), heritage (see Chapter 18: Archaeology and Cultural Heritage) and community value (see Chapter 24: Population and Human Health).	Network. The PCC Site is 2.8 km to the west.		Chapter 18: Archaeology and Cultural Heritage Chapter 23: Population and Human Health		
Lovell Hill Pools SSSI	Designated for its outstanding assemblage of dragonflies and damselflies	Located 6.2 km south-east of PCC	National, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r
Saltburn Gill SSSI	Designated for its mixed deciduous woodland supporting a diverse ground flora.	Located 10.4 km south-east of the PCC.	National, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r
North York Moors SSSI	Designated for a variety of terrestrial and ornithological (see Chapter 15: Ornithology). Designated interest features relevant to this chapter include mire, blanket bog, dry upland heath, wet upland heath and moorland habitats (the North York Moors contains the largest continuous tract of heather moorland in England).	Located 11.9 km south-east.	National, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
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 nationally important numbers of wintering shore birds and breeding little terns.	Located 12.7 km northwest of the PCC.	National, statutory protected	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r
Local Statutory and Non-Statutory Nature Conservation Designations						
Eston Pumping Station LWS	Designated for its mosaic of habitats and borderline neutral urban grasslands.	Within the red line boundary for Connection Corridors but avoided by Proposed Development (no direct effects). Located 1.1 km south of the PCC.	County, non-statutory	Appendix 12C: PEA Chapter 8: Air Quality	O	n/r (avoided by the Proposed Development)
Coatham Marsh LWS	Designated for its saltmarsh, coastal grasslands, flushes, seepages and springs.	Within the red line boundary for Connection Corridors but avoided by Proposed Development (no direct effects). Located 600 m east of the PCC.	County, non-statutory	Appendix 12C: PEA	O	n/r (closest requirement of the Proposed Development is operational use of Northumbrian Water's existing water supply pipeline which is located adjacent to the LWS)

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
Habitats (local or higher value habitats only, and excluding habitats that are reasons for designation of the above nature conservation designations)						
Semi-improved grassland	Variable quality, most is of secondary origin on previously developed land and relatively species-poor. Some contributes to Open Mosaic Habitats.	Widespread within the land required in both boroughs.	Up to Borough, Local Biodiversity action Plan (LBAP)	Appendix 12C: PEA	C, D	C, D
Scrub	Scrub habitats are of recent secondary origin and readily substituted. Comprised of common species, some of planted origin.xtended Red Line Boundary (RLB).	Widespread within the land required in both boroughs.	Local	Appendix 12C: PEA	n/r	C, D
Broad-leaved woodland	Variable quality, some of recent second origin while others are mature.Variable	Localised, but locally extensive within the land required in both boroughs.	Up to Borough, S41, LBAP	Appendix 12C: PEA Reports	n/r	C, D

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
Hedgerows	Species-poor, a scare habitat in this heavily urbanised landscape.	Restricted to the arable fields around Lackenby substation and Lazenby and Kirkleatham.	Borough, S41, LBAP	Appendix 12C: PEA	n/r	C, D
Coastal and floodplain grazing marsh	This habitat is defined by it hydrological and topographical characteristics rather than botanical interest. The majority of sites have low botanical grassland interest, but nevertheless may be important for birds (see Chapter 15: Ornithology).	Very limited overlap with the land required at Seal Sands.	Up to Borough, S41, LBAP	Appendix 12C: PEA	n/r	C, D
Open Mosaic Habitats on Previously Developed Land (OMH)	Intimate mixtures of grassland, ephemeral and scrub communities and standing waters. The quality of the constituent habitats and associated flora (which is determined by local substrate characteristics) is limited and relatively uniform.	Localised, but locally extensive within the land required in both boroughs.	Borough, S41, LBAP	Appendix 12C: PEA	C, D	C, D

Species (excluding freshwater fish and other true aquatics, marine species and birds, see Chapters 13, 14 and 15 respectively for these)

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
Terrestrial invertebrates	-	The invertebrate assemblages of relevance to the Proposed Development are those that support notable species. These are associated with localised areas of notable and/ or scarce habitats, i.e. those of known of high value and designated for invertebrates (Coatham Sands, Teesmouth and Cleveland SSSI), and other notable habitats affected by permanent land-take or substantive temporary effects (relative to total available habitat area).	County, S41, LBAP	Appendix 12C: PEA Appendix 12F: Invertebrate Survey Report	C, D	C, D

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
Great Crested Newt	-	Pending further survey, this species is assumed to occur within the land required at the Seal Sands industrial complex, Stockton-on-Tees.	Up to Regional, legally protected, S41, LBAP	Appendix 12C: PEA	n/r	C, D
Otter	-	Known or likely presence on all watercourses and making use of coastal habitats in both boroughs.	Up to Borough, legally protected, S41	Appendix 12C: PEA Appendix 12G: Otter and Water Vole Survey Report	n/r	C, D

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
Bats	-	High quality habitats present in Coatham Sands (Teesmouth and Cleveland SSSI). Likely to be present elsewhere but Proposed Development will not meaningfully affect habitat quality or availability. One building of up to local suitability will be demolished.	Up to Borough, legally protected, s41, LBAP	Appendix 12C: PEA Appendix 12D: Bat Survey Report	n/r	C, D
Badger	-	-	Up to Local, legally protected	to be confirmed	If relevant this species will be assessed in a standalone confidential report. If relevant this species will be assessed in a standalone confidential report. No setts found to date	

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
Common lizard	-	This species was not found during surveys of PCC site but a small population is present on adjacent land, so it may occur at low density in grassland habitats. Known population at Coatham Sands, survey work is ongoing to determine the status of this species in the land required.	Up to Borough, S41, legally protected	Appendix 12C: PEA Appendix 12F: Reptile Survey Report	C, O, D	C, O, D
Notable flora	Several notable plant species have been recorded from Coatham Sands (Teesmouth and Cleveland Coast SSSI). No other notable species populations are known that are likely to be adversely affected by the Proposed Development.	Surveys are ongoing in the SSSI.	Up to Regional, some Nationally Scarce, S41 and LBAP	Appendix 12C: PEA	n/r	C, O, D

Relevant ecological feature	Description of feature	Relationship to the Proposed Development	Ecological value and status	See related Chapter or Appendix of this PEI Report (Volume I or III)	Relevance to Assessment of the Proposed Development (C = construction, O = operation*, D = decommissioning, n/r = not relevant)	
					PCC	Proposed Connection corridors[1]
Controlled Weed Species	Three terrestrial non-native plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded from land required for the Proposed Development.	Giant hogweed *(Heracleum mantegazzianum)* was found in the vicinity of the PCC. Japanese rose *(Rosa rugosa)*, Himalayan balsam *(Impatiens glandulifera*) were also recorded from land within Redcar and Cleveland. These and other species may occur in Stockton-on-Tees (surveys ongoing).	No value, offence to cause to spread	Appendix 12C: PEA	C, D	C, D

*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 should be assumed than maintenance activities will also not be adverse.

Operation (2026)

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

12.5.5 Based on 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.

12.5.6 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[1]. 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.

12.5.7 It is likely that current and former industrial land adjacent to the Site would be released for new development e.g. in accordance with 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.

12.5.8 Counter to this, implementation of planning policy and legal requirements (including anticipated legal requirements to deliver substantive biodiversity enhancement) may mean that future adjacent developments incorporate features of value for biodiversity, resulting in 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.

12.5.9 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.

[1] 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.

Decommissioning (circa 2051)

12.5.10 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 development (see Appendix 9A: Flood Risk Assessment, PEI Report, Volume III), 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, and 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.

12.5.11 The decommissioning baseline is more likely to be influenced by future land-use and nature conservation regimes. The processes identified for operation (above) will continue, with the balance between adverse effects and beneficial habitat improvements unknown and highly speculative. This limits the assumptions that can be made for the purposes of this assessment. However, it should also be noted that the likely zone of influence of decommissioning will be much smaller than operation (air quality effects) and likely construction also. Decommissioning activities will involve removal of above ground infrastructure only and will primarily be located within the built footprint of the Proposed Development rather than within areas of vegetation. Relevant ecological features will therefore be much reduced relative to those relevant at construction and operation.

12.5.12 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.

12.5.13 This is discussed further within Chapter 4: Proposed Development (PEI Report, Volume I).

12.5.14 Responses to consultation on this PEI Report will be used to help inform the consideration of the future baseline for the ES.

12.6 Development Design and Impact Avoidance

12.6.1 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, PEI Volume III) and relevant planning policy.

12.6.2 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 e.g. prevention of surface and ground water pollution, fugitive dust management, noise prevention or amelioration. It must be assumed that measures available to regulators to secure such requirements will be properly applied and enforced by the relevant regulators. Many of the measures required are already committed as set out in the draft Construction Environmental Management Plan (CEMP).

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

12.6.4 As far as practicable, the Proposed Development has sought to avoid nature conservation designations, including Eston Pumping Station LWS which is located within the proposed CO2 Gathering Network and Natural Gas Connection corridors.

12.6.5 Where possible, routing of connection corridors is to utilise existing infrastructure, including the extensive existing network of pipeline racks, to minimise excavations and construction activities required and therefore minimise disturbance to species and habitats present.

12.6.6 In the case of the CO_2 Export Pipeline and in areas where replacement of other connection corridors is required, trenchless technologies will be utilised where possible to minimise effects on habitats and species. In sections where trenchless technologies is not technically feasible, consultation will be undertaken with Natural England to identify an appropriate habitat mitigation plan, the details of which will be submitted with the final ES.

12.6.7 Permanent habitat losses associated with pipelines will be minimised through compliance with the requirements of NPS EN-4. This requires post-construction reinstatement of pipeline routes as close to its original state as possible. While this does not remove the construction impact, it does provide (except for irreplaceable habitats) certainty of reinstatement of habitats back to an appropriate end condition, as a 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 will be submitted with the final ES.

12.6.8 Where the Natural Gas Connection Corridor, Electrical Connection Corridor and CO_2 Gathering Network cross boundaries with hedgerows and trees, their removal would be avoided as far as possible through consideration of micro-siting options e.g. making use of existing hedgerow gaps as far as

possible. Appropriate tree root protection zones will be defined in advance of construction to avoid impacts on retained hedgerows and trees.

12.6.9 An Environmental or Ecological Clerk of Works (ECoW) would be present during construction as appropriate to supervise and instruct implementation of impact avoidance commitments.

12.6.10 The final stack height for the Proposed Development will be determined at the detailed design stage and would be optimised with consideration given to minimisation of ground-level air quality impacts on relevant ecological features. This would be dependent upon the final stack location and building heights for the Proposed Development. At PEI Report stage, dispersion modelling of emissions to air has been undertaken to determine the optimum stack height range through comparison of the maximum impacts at human health and relevant ecological features, to ensure that potential impacts at are minimised and avoided where feasible (see Chapter 8: Air Quality, PEI Report Vol I). This will be refined further for the final ES.

12.6.11 An Indicative Lighting Strategy would be prepared to accompany the DCO application to demonstrate how lighting impacts on sensitive ecological features, including bats, have been considered and addressed in the development design.

12.7 Likely Impacts and Effects

12.7.1 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 12.6 above).

12.7.2 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 legislation and regulatory regimes in place to allow control of this, and the mitigation otherwise committed in Chapter 8: Air Quality and Chapter 9: Hydrology and Water Resources (PEI Report, Volume I).

12.7.3 In making this assessment, regard has been given to other relevant Chapters, specifically Chapter 8: Air Quality and Chapter 9: Hydrology and Water Resources (PEI Report, Volume I). It is not considered necessary in this chapter to replicate the full impact assessment provided in these source chapters. This chapter therefore restricts its scope to the pertinent points, while also signposting the relevant source assessments. 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 draft CEMP.

12.7.4 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

International and National Nature Conservation Designations

12.7.5 Construction of the Proposed Development only has the potential to affect terrestrial features of interest of Teesmouth and Cleveland Coast SSSI within Redcar and Cleveland. Use of the existing network of pipeline racks along wayleaves allows the Proposed Development to avoid construction works that would be likely to affect terrestrial features of interest of the SSSI within Stockton-on-Tees.

12.7.6 Based on consideration of possible impact pathways and the findings of Chapter 8: Air Quality and Chapter 9: Hydrology and Water Resources (PEI Report, Volume I), there are no likely significant direct or indirect construction impacts and effects on any other statutory terrestrial ecology designations.

12.7.7 The relevant part of Teesmouth and Cleveland Coast SSSI is the area known as Coatham Sands (SSSI Unit 28), an extensive area of sand dune habitat representing a complete transition of component habitats from pioneer open dune communities through to more mature dune grassland, dune scrub and dune slack.

12.7.8 Construction dust could reach the SSSI (Chapter 8: Air Quality, PEI Report, Volume I) but as this is also a human health issue it would need to be prevented, and therefore would not occur in practice. Measures to control dust are identified and committed in Chapter 8 and no other adverse air quality impacts are predicted.

12.7.9 Construction of the CO_2 Export Pipeline and the Water Discharge Pipeline across the dunes and Coatham Sands to below Mean Low Water will require excavation of trenches to approximately 1.2 m below ground level. This will 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 and (where necessary) re-planting to the original state as required.

12.7.10 The maximum corridor width required for open cut pipeline construction is 35 m. Therefore, construction of both pipelines may require temporary disturbance and removal of up to 4 ha of sand dune habitat across the full habitat transition from beach to mature habitats adjacent to Teesdale Way, comprising 1.7 ha for the CO_2 Export Pipeline and 2.3 ha for the Water Discharge Pipeline. This represents approximately 3% of the 129 ha of dune

habitat at Coatham Sands and approximately 2.2% of the 184 ha of the sand dune interest feature of the SSSI as a whole (based on habitat areas given in Natural England, 2018).

12.7.11 It is noted that the NPPF has defined sand dunes as an 'irreplaceable' habitat for the purposes of impact assessment and implementation of planning policy. However, in this instance it is considered that the Proposed Development would not result in the loss of sand dune habitats. Instead, the Proposed Development would cause temporary disturbance to part of (up to 3%) a single cohesive sand dune system. The appropriateness of this assumption as a basis for impact assessment will be discussed further with Natural England and confirmed in the final ES.

12.7.12 Natural England considers that the laying of pipelines is an operation of specific concern due to the potential for direct loss of geological, habitats and associated flora/fauna features of interest (Natural England, 2018).

12.7.13 The implications of the required temporary land take for the integrity of the dune habitats requires more detailed assessment with reference to additional survey data. This assessment will be provided in the final ES. However, the magnitude of the impact is not considered likely to affect the integrity of the SSSI as a whole, or the integrity and conservation status of the sand dune system at Coatham Sands. The worst-case habitat disturbance described above indicates that 97% of the SSSI would remain unaffected. In addition, Natural England considers the whole sand dune system to be in favourable condition and therefore localised temporary impacts and effects are unlikely to compromise this or be adverse for the wider integrity of the dune system. The potential for adverse effects on specific component habitats or vegetation communities cannot be fully discounted at this time and further habitat survey is being undertaken in 2020 to permit assessment of this.

12.7.14 As well as temporary land take from sand dune habitats, construction works have the potential to create conditions that may destabilise adjacent areas of dune (e.g. by increasing the potential for blow out of exposed sand through wind disturbance). Similarly, there may be disturbance to ground water regimes and recharge with the implications of this for affected habitats currently uncertain. Sand dune wetland habitats are known to be highly sensitive to relatively minor changes in average hydrological conditions (Curreli *et al*. 2013). However, the sensitivity of wider sand dune vegetation is less certain. While it is known that sand dune water tables can vary substantially from one year to the next, it remains uncertain how quickly sand dune plants respond to changes in hydrology and therefore how sensitive they might be to temporary perturbations in ground water availability e.g. as might result during construction (UK Centre to Ecology and Hydrology, 2016).

12.7.15 Conversely, in some circumstances disturbance and destabilisation effects might be considered beneficial where dunes have become too stable and immobile, resulting in dominance by rank grassland and other late successional habitats at the expense of habitats suitable for species of more open vegetation (i.e. those species typically of highest nature conservation

concern). It is generally accepted that over recent decades, dunes across north-west Europe have become over-stabilised (UK Centre to Ecology and Hydrology, 2016).

12.7.16 The results of the above habitat disturbances may affect dependent plant and terrestrial invertebrate species and assemblages, and these form part of the designated interest of the SSSI. The scale and significance of any effect will depend on the distribution and abundance of the affected species within the dune system and more widely (where regionally or nationally rare or threatened). Habitat and species survey work is ongoing to permit assessment of this as part of the final ES. However, based on specific surveys for one notable invertebrate species (the Nationally Rare and threatened spider *Silometopus incurvatus*) it is likely that all specialist sand dune species will occur widely across Coatham Sands in association with suitable sand dune habitats. As there are no terrestrial sand dune habitat features within Coatham Sands that are likely to be restricted to the land required for construction, the dependent flora and fauna of the habitats present are also unlikely to be restricted to the land required for construction. Areas of retained habitat within the wider unaffected dune system are likely to be sufficient to maintain species assemblages during construction with no adverse effect on conservation status. On the completion of construction works, habitat reinstatement (through planting or passive processes) will allow habitat to re-establish, and once established these are likely to be re-colonised by notable plants and invertebrates.

12.7.17 Pending further assessment, it is considered that the potential temporary adverse effect on the integrity of the SSSI and the nature conservation status of its sand dune habitats and associated plant and terrestrial invertebrate assemblages will be **significant (moderate adverse)** at up to the county level. This is based on consideration of the magnitude of impact i.e. up to 3% of the sand dune system at Coatham Sands, with 97% remaining unaffected. As Natural England has assessed the whole dune system as being in favourable condition, temporary effects on habitats and species are not considered likely to be significant at the regional or national level.

12.7.18 This initial precautionary conclusion is reached before taking into consideration site-specific mitigation and habitat management measures (an appropriate approach at the PEI stage). Site-specific mitigation is being developed in consultation with Natural England and other stakeholders, as required. This will be provided in the ES submitted with the DCO application.

Local Nature Conservation Designations

12.7.19 Following review of likely impact pathways and the findings of Chapter 8: Air Quality and Chapter 9: Hydrology and Water Resources (PEI Report, Volume I), no likely significant construction impacts and effects are predicted for local nature conservation designations.

12.7.20 While Eston Pumping Station LWS is located within the Site (see Figure 12.1, Appendix 12C: PEA), it will be avoided during construction of the Proposed Development.

12.7.21 While Chapter 8: Air Quality identifies that construction dust could reach Coatham Marsh LWS this is not likely to occur as it is also a human health matter that would need to be prevented. Therefore, it can be assumed that this would be prevented and otherwise controlled through regulatory requirements. Measures to control dust are identified and committed in Chapter 8 and no other adverse air quality impacts on local nature conservation designations are predicted.

Habitats

Semi-improved Grassland

12.7.22 Construction of the PCC in Redcar and Cleveland would lead to a permanent loss of up to 20 ha of secondary semi-improved neutral grassland. Adjacent areas of grassland may also be damaged during construction e.g. due to compaction and disturbance from construction vehicles, and laydown of materials during construction. In comparison with some of the other grasslands in the Site, where management regimes are less favourable, this grassland is of relatively higher nature conservation value (Borough value) due to its botanical diversity and because in places it occurs in matrix with and contributes to OMH. Options to reduce these habitat impacts will be considered further in the final ES.

12.7.23 If a temporary laydown area is established at the location of the Saltholme Substation within Stockton-on-Tees then this will affect grassland considered to be coastal and floodplain grazing marsh, a S41 habitat. Up to 8 ha of grassland will be lost at this location. This grassland is species-poor and is of biodiversity value mainly for its potential importance to birds. However, at this location the quality of the s41 habitat is influenced (reduced) through proximity to the substation and the local road network and other features. Given these factors, this small area is considered to be of local value due to these other influences on the structure and function of the habitat. Options to reduce the habitat impacts will be considered further in the final ES.

12.7.24 Construction of the Natural Gas Connection Corridor and CO_2 Gathering Network in Redcar and Cleveland and Stockton-on-Tees, and the Freshwater Connection Corridor and Electrical Connection Corridor in Redcar and Cleveland, may also result in permanent and temporary losses of secondary semi-improved grassland. At present this cannot be quantified as the design and use of existing infrastructure needs to be considered further. However, permanent losses are likely to be relatively small when compared with the total resource of secondary grassland across the Site and adjacent land. Where possible, existing pipelines and rack systems will be used to avoid new land take. After this has been considered options to restrict works to the more species-poor grasslands, such as the rank unmanaged grassland along the banks of The Fleet, will be considered to avoid affecting grasslands of relatively higher nature conservation value. In some cases, temporary disturbance of grassland habitats during construction may be ecologically beneficial e.g. by re-setting ecological succession back to a more optimal state, or by reinstating areas OMH that have been lost to establishment of rank species-poor grassland.

12.7.25 Impacts and effects on grassland habitats within connection corridors will be assessed in more detail in the final ES. In so doing, an attempt will be made to align connection corridors to accord with the Environment and Biodiversity Strategy and planning policy for the South Tees Area. Local planning policy, including the South Tees Area SPD (adopted May 2018) identifies that the South Tees Area encompasses extensive areas of former industrial land offering opportunities for major employment-generating redevelopment. This policy therefore recognises that some habitat losses are likely to be acceptable as long as significant environmental assets are protected and enhanced wherever possible

12.7.26 On a precautionary basis, until further survey and assessment is completed, it is considered that the combined construction impact on semi-improved grassland habitats, including coastal and floodplain grazing marsh, could result in a significant effect at up to Borough level. Until further design information is available, the potential effect on the conservation status of semi-improved grassland habitats is therefore assessed as **significant (moderate adverse)** at up to the borough level.

Scrub

12.7.27 Construction of the PCC in Redcar and Cleveland would lead to the permanent loss of up to 2 ha of scrub. This scrub is of relatively recent origin, compromised of common plant species, and is primarily of planted origin.

12.7.28 Potential land requirements during construction of the connection corridors in Redcar and Cleveland and Stockton-on-Tees may also require some scrub removal or pruning, but scrub would be avoided where practicable. 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 reported in the final ES. Scrub would be capable of rapid recolonisation through natural processes after construction, unless the land is actively managed to prevent this (which it currently is not). 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.

12.7.29 The combined requirements for scrub removal will reduce the habitat resource within the Site. However, in many cases this would be temporary only as it can be readily reinstated through natural processes or (if required) new plantings. Given the above assessment and because scrub habitats occur widely across the Site and adjacent land, the potential adverse effect on the conservation status of scrub habitats of local value is assessed as **not significant (minor adverse).**

Broad-leaved Woodland

12.7.30 Broad-leaved woodland is present within the Electrical Connection Corridors between Lazenby and Grangetown and Kirkleatham and Dormanstown in Redcar and Cleveland, and the CO_2 Gathering Network in Stockton-on-Tees.

12.7.31 A general design principle of the Proposed Development is that woodland will be avoided as far as practicable during construction, either through route selection or use of trenchless technologies. In very limited circumstances

this may not be practicable, for example if the electrical connections require use of overhead powerlines. But in such circumstances any impact would be localised and relatively small scale e.g. creation of powerline wayleaves functionally comparable to woodland glades or rides. Routes would be selected to avoid losses of veteran and ancient trees, given the requirements of planning policy in relation to such trees.

12.7.32 Therefore, while localised tree losses may be permanent (given losses of mature trees could not be compensated within a reasonable timeframe) the ecological effects on woodland as a habitat (comprising trees and other associated habitat features and flora of value) would be less significant. Nature conservation priorities for woodland often involve opening the canopy or creating glades and rides, so if the affected trees are not of specific nature conservation interest then the opening up of powerline wayleaves is not likely to be adverse for woodland biodiversity. The extent of woodland habitat loss and options for sensitive design will be determined when construction working requirements are finalised and will be reported in the final ES.

12.7.33 Taking the above into account, the potential unavoidable construction impacts on the conservation status of broad-leaved woodland at the local level is assessed as **not significant (minor adverse)**.

Hedgerows

12.7.34 Networks of species-poor hedgerows occur within the Electrical Connection Corridors at Lazenby and Kirkleatham in Redcar and Cleveland. While the construction method, route and orientation of these connection corridors are not finalised, the worst case requirement is localised hedgerow loss (up to 40 m width at each hedgerow location) if the electrical connections are installed underground. Hedgerow gaps would be replanted with native trees and shrubs after construction, in accordance with good practice and NPS requirements for habitat reinstatement. Requirements for localised hedgerow removal and reinstatement will be confirmed in the final ES.

12.7.35 The potential localised and temporary construction impact on a hedgerow network of up to borough value is minimal and unlikely to adversely affect the structure, function or nature conservation status of the wider hedgerow network. The potential effect is therefore assessed as **not significant (minor adverse)**.

Open Mosaic Habitats on Previously Developed Land

12.7.36 Open mosaic habitat is a composite habitat encompassing a number of the identified Phase 1 habitat types (Appendix 12C: Preliminary Ecological Appraisal (PEA) Report, Figure 12C-1), particularly ephemeral/ short perennial in matrix 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 particularly in proximity to the PCC, where there are areas of disturbed and former industrial land, and potentially also in association with the CO_2 Gathering Network in Stockton-on-Tees.

12.7.37 Construction of the PCC would lead to the permanent loss of approximately 18 ha of OMH (see Appendix 12C: PEA, Target Note 2). This example of the habitat is relatively poor quality and was scoped out of terrestrial invertebrate

survey on this basis, being predominantly bare earth and spoil with some areas vegetated with scattered scrub and patches of rough grassland and short perennial/ ephemeral species. This limited area is therefore considered to be of Local value only and the likely effect of its loss is **not significant (minor adverse)**.

12.7.38 Elsewhere OMH occurs within the CO_2 Gathering Network Corridors, Natural Gas Connection Corridors and Electrical Connection Corridors. In these areas the habitat effects would localised and temporary e.g. during installation of buried pipelines. Localised temporary construction disturbances are unlikely to be adverse for OMH as long as the habitat can re-establish (through natural/ passive processes) afterwards. Regular periodic but localised disturbance is essential for maintaining bare ground, disturbed ground and early succession vegetation communities i.e. the primary interest features of OMH. Without such disturbance, OMH is likely to be lost over time to establishment of mature rank grassland and scrub communities. This progressive loss of open habitats to grassland and scrub is evident over most of the Site, except where artificial substrates are locally present and serve to limit the establishment of rank grassland and scrub. Given this, the proposed construction works could be beneficial for OMH where it is being lost to other habitats. Therefore, the wider construction impact of the Proposed Development (away from the PCC) on the structure and function and conservation status of OMH of up to County value is assessed as **not significant (neutral)**.

Species

Terrestrial Invertebrates

12.7.39 Surveys in 2018 recorded a terrestrial invertebrate assemblage of County value within and adjacent to the PCC in Redcar and Cleveland (see Appendix 12F: Invertebrate Survey Report, PEI Report, Volume III). This assemblage was present in association with open habitat features, particularly open short sward grassland, other flower-rich grassland and scrub edge. No meaningful difference was found between the assemblages associated with land required for construction of the PCC and those of adjacent land 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. Given, this the widespread presence of a comparable assemblage in other comparable habitats would be reasonably expected. Therefore, the permanent loss of habitats for construction of the PCC 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. The effect of this habitat loss on terrestrial invertebrates at the local level is therefore assessed as **not significant (minor adverse)**.

12.7.40 Survey work is ongoing in the wider Site and will be reported in the final ES. The terrestrial invertebrate assemblage of Teesmouth and Cleveland Coast SSSI is assessed separately under designations, see above.

12.7.41 It is assumed that there is potential for locally distributed assemblages, each of up to county value, to occur within areas of suitable habitat within the CO_2

Gathering Network Corridor in Stockton-on-Tees. Within this area, habitat impacts will be localised and temporary with worst case construction requirements involving the burial of pipelines and cables through relatively uniform areas of habitat, most of which will be retained unaffected. Terrestrial invertebrate assemblages in retained unaffected habitats would be able to recolonise land disturbed during construction once vegetation re-establishes. Terrestrial invertebrate species and assemblages dependent on OMH and open grassland, typically those of highest nature conservation value due to the scarcity of such habitats, may benefit from construction works due to disturbances of mature species-poor grassland and scrub and the re-setting of habitat succession to an earlier state (see also the related assessment of impacts and effects on OMH, above under Habitats).

12.7.42 Given these considerations, the combined potential local level effects on terrestrial invertebrate assemblages in the wider site is assessed as **not significant (minor adverse)**.

Great Crested Newt

12.7.43 Up to 20 ponds in Stockton-on-Tees potentially suitable to support breeding populations of great crested newt have been identified within 250 m of those parts of the Site where construction works may affect either these ponds or terrestrial habitats suitable for great crested newt. These ponds will be surveyed (subject to agreement of land access with third parties) for the species in spring 2020, with the results reported in the final ES. Surveys and consultation with INCA have confirmed that great crested newt is not a relevant consideration in Redcar and Cleveland.

12.7.44 Currently it is anticipated that all relevant ponds can be avoided during construction. Where (worst case) ponds cannot be avoided and would be lost, relevant construction works would be subject to the prior attainment of a European Protected Species Mitigation Licence (EPSML), and this would include agreement of appropriate mitigation. Relevant construction works could not lawfully proceed without prior attainment of the EPSML and agreed mitigation must be suitable to maintain the favourable nature conservation status of the species. There is sufficient land available within the Site in Stockton-on-Tees to provide mitigation for the loss of great crested newt ponds, where this cannot be avoided. Given this, this is a regulatory matter only and no significant adverse effects are likely, as this is not permitted under relevant legislation.

12.7.45 Great crested newt terrestrial habitats, primarily unmanaged grassland, might also be affected by laydown requirements and construction of a single CO_2 Gathering Network pipeline across the Seal Sands industrial complex. The habitat impacts would be temporary and would affect only a relatively small proportion of the total terrestrial habitat available to the species in the vicinity of the relevant ponds (all of which are located in areas dominated by grassland and other semi-natural habitats). Following construction, suitable habitats can be re-established (either passively or through plantings) and this is otherwise required to meet good practice and comply with NPS EN-4. As stated above, this is a regulatory matter as legal requirements would need to be met during construction and are not optional. Therefore, no

significant adverse effects on great crested newt from temporary losses of terrestrial habitat are likely. For purposes of clarity, the minimum mandatory requirements necessary to ensure legal compliance in relation to great crested newt are summarised in the Mitigation section of this PEI Report.

12.7.46 Due to the nature of the likely construction impacts on great crested newt habitats and the need to meet legal requirements, it can be assumed that the likely effect on great crested newt (if present and regardless of the assessed nature conservation value of the relevant populations) is **not significant (neutral)**.

Otter

12.7.47 This species has been recorded from all of the main watercourses associated with the Site. However, most sections of watercourse coinciding with locations for construction works lack habitat suitable for use by otter for holts and lying-up. The possible exception to this is the banks of the River Tees in Redcar and Cleveland and Stockton-on-Tees, where there may be riverbank structures suitable for use by otter. Surveys are planned for 2020 to investigate this further and will be reported in the final ES.

12.7.48 Should otters use this section of the River Tees then there is only likely to be a maximum of two adult otters present, assuming some overlap in territory e.g. between males and females. Otters are strongly territorial and a typical otter territory comprises upwards of 14 km of contiguous watercourse habitat (Chanin, 2003). Construction requirements for the Proposed Development will only affect a small part of the total habitat available to the species on the banks of the River Tees, at the locations of trenchless technologies start and end points for the Natural Gas Connection pipeline, CO_2 Gathering Network pipeline, and in association with the Water Abstraction. The localised impacts would not affect the conservation status of the species, or deny otter access to foraging habitat. Given the extensive habitat available, the resident otter may choose to avoid areas where construction works are in progress, but there would be no likely implications for their conservation status from doing so. However, the existing baseline conditions of a busy industrial port and industrial complex strongly suggests that any otters present will already be well habituated to human activities, vehicle movements and associated background noise levels.

12.7.49 There would remain potential for conflicts with relevant legislation should otters use bankside habitats or structures for holts or lying-up. This is a regulatory matter and no significant adverse effects are likely if the requirements of the relevant legislation are met. The Proposed Development would be constructed in a manner that complies with all relevant legislation.

12.7.50 Taking the above into account, the construction of the Proposed Development would be unlikely to result in an adverse effect on the conservation status of an otter population associated with the banks of the River Tees of local nature conservation value. The predicted temporary effect is therefore **not significant (neutral)**.

Bats

12.7.51 The PCC site contains one building that requires demolition and which has been assessed as having low suitability for use by roosting bats based on an external inspection only. Further survey work is planned for summer 2020 to further investigate and verify this initial assessment. The results of this survey will be reported in the final ES. No evidence of bats was found in association with this building at the time of survey (**Appendix 12D:** Bat Survey Report). Low suitability means that this building has one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/ or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats, or to be suitable for maternity of hibernation (Collins, 2016). The only bat species recorded during activity surveys in proximity to this building, and therefore the species most likely to make opportunistic use of this building, were common pipistrelle, soprano pipistrelle and noctule. These species are all common and not currently considered threatened.

12.7.52 The loss of low suitability opportunistic roost sites would not reasonably be anticipated to adversely affect the conservation status of any bat species, and certainly not the species recorded during the activity survey. The effect would be at the level of the individual bat that would no longer be able to access the building for opportunistic roosting. On the assumption that roosts are present, relevant construction-related demolition works could not lawfully proceed without prior attainment of an appropriate licence, likely a Bat Low-Impact Class Licence (BLiCL) in this case due to the low suitability of the relevant features. In using this licence, appropriate simple mitigation measures (e.g. provision of bat boxes) would need to be provided to compensate for the loss of opportunistic roosting habitat. There is sufficient land available within the wider Site to provide this habitat mitigation, and such mitigation is common practice and readily implemented. Given this, Natural England would reasonably be expected to grant a licence for the loss of any roosts present. This is therefore a regulatory matter only and no significant adverse effects are likely, as this is not permitted under relevant legislation.

12.7.53 As the majority of construction work is being completed during the day, disruption of foraging behaviour is likely to be minimal. During spring to autumn when bats are active the committed construction hours will largely coincide with daylight hours when bats are in their roosts. Although 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. Such activities will mainly be at the PPC, where bat activity surveys have only recorded very low levels of bat activity (reflecting the exposed location and sub-optimal habitat structure). Construction lighting is therefore very unlikely to impact bat habitat usage, and not to the extent that an adverse effect on conservation status is likely.

12.7.54 Based on the findings of the surveys of the PCC, the permanent habitat losses at this location are not considered likely to be adverse for bats.

Habitat losses are predominantly of exposed areas of open grassland and OMH. Extensive areas of comparable foraging habitat are present on adjacent land for use by the small numbers of bats recorded during surveys. Requirements for landscape screening plantings, to be implemented at the end of the construction phase, can reasonably be expected to improve the quality of foraging habitat for bats around the PCC once these have matured.

12.7.55 Survey work is being undertaken over 2020 to determine levels of bat activity in association with wetland habitats within Coatham Sands, part of Teesmouth and Cleveland Coast SSSI within Redcar and Cleveland. This will be reported in the final ES. Bats are not a designated feature of interest of the SSSI, but it is considered that the habitats present could support notable bat assemblages of up to County value. These habitats will either be removed during construction of the CO_2 Export Pipeline and the Water Discharge Pipeline across the dune system or experience indirect effects as a result of changes in groundwater regimes.

12.7.56 Chapter 9: Hydrology and Water Resources (PEI Report, Volume I) states that it is not currently known how these wetland habitats are fed, and whether the Proposed Development would impact existing groundwater flow directions or volumes. This will be determined through further hydrological investigation and reported in the ES. Given this uncertainty, it is not known whether the effects of open cut construction measures on wetland habitats would be temporary, or whether there might be a permanent impact on the hydrology and therefore structure and function of existing wetland habitats for bats.

12.7.57 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.

12.7.58 Pending the completion of bat activity surveys at Coatham Sands it is assumed that there is potential for an adverse effect on bats from permanent loss or degradation of foraging habitats that is **significant (moderate adverse)** at the County level.

Common Lizard

12.7.59 Surveys have confirmed the presence of a small population of common lizard (one individual recorded following a standard programme of presence/absence survey) in association with grassland habitats within the PCC and on adjacent land within Redcar and Cleveland (Appendix 12E: Reptile Survey Report, PEI Report, Volume III, and INCA, 2019). The permanent habitat loss required for construction of the PCC is limited and localised in comparison with the full extent of the comparable habitat resource present across surrounding land. Given this, there is sufficient habitat available to common lizard to accommodate the small numbers of individuals that may be displaced from the PCC due to loss of grassland habitats. The committed approach for safeguarding protected species during construction site clearance will ensure that legal requirements for animal welfare are met during construction. Given this, construction of the PCC is

not anticipated to be adverse for the conservation status of a small population of common lizard of local nature conservation value.

12.7.60 Desk study information indicates the presence of a common lizard population in association with Coatham Sands, part of Teesmouth and Cleveland Coast SSSI within Redcar and Cleveland. Common lizard is not a reason for designation of the SSSI. Surveys are being undertaken in 2020 to obtain data on the status of the species in association with habitats that may be affected by the Proposed Development.

12.7.61 Construction of the CO_2 Export Pipeline and the Water Discharge Pipeline across Coatham Sands will require excavation of trenches to approximately 1.2 m below ground level. This will 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 and (where necessary) re-planting to the original state as required. The maximum corridor width required for open cut pipeline construction is 35 m. Therefore, construction of both pipelines may require temporary disturbance and removal of up to 4 ha of common lizard habitat (up to 2.5% of the potential habitat at this location) and might result in the trapping and/or injury of common lizards within construction areas. Given the extent of suitable habitat within Coatham Sands, this temporary habitat loss is unlikely to affect the conservation status of the species because other habitats would remain available in the wider sand dune complex.

12.7.62 Permanent habitat loss for common lizard would not occur, and conditions are likely to start to become suitable for reoccupation by common lizard within 12 months of completion of construction and the committed habitat restoration. Habitat restoration is a requirement of planning policy so would need to form part of the final development design. Therefore, there can be confidence that habitats would be reinstated to a condition suitable for use by common lizard after construction. Most especially, given the affected land is part of a designated SSSI. Common lizard would be a consideration in developing and agreeing the habitat restoration specification with Natural England. This restoration strategy will be provided with the final ES.

12.7.63 The committed approach for safeguarding protected species during construction site clearance will ensure that legal requirements for animal welfare are met during construction.

12.7.64 Pending completion of surveys, it is assumed that Coatham Sands may support a common lizard population of up to County value. However, given the temporary nature of the proposed construction works, and restriction of works to less than 3% of the total sand dune area it is assessed that the potential effect would be at the local level only and **not significant (minor adverse)**.

12.7.65 No other temporary or permanent habitat impacts are predicted that would be likely to adversely affect 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. The rationale applied for the PCC, applies to all other areas of the Site where habitats are potentially suitable for common lizard.

Controlled Weed Species

12.7.66 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.

12.7.67 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 this impact assessment, as it is primarily a matter for legal compliance. It is emphasised that it is an offence to cause controlled weed species to spread in the wild, so appropriate working practices would be put in place to deliver legal compliance. This would be outlined in the outline CEMP and a supporting Invasive Species Management Plan (ISMP) would be provided later if required.

12.7.68 In compliance with legal requirements, effective mitigation would be applied to prevent the spread of propagules of controlled weeds beyond the immediate construction working area. With such measures in place there would be no pathways likely to result in significant adverse effects.

Operation

International and National Nature Conservation Designations

North York Moors SAC and SSSI

12.7.69 The North York Moors SSSI and SAC (also a SPA for bird features only, for assessment of which see Chapter 15: Ornithology and Appendix 15D HRA LSE Screening Report) is located 11.9 km south from the PCC, within the potential ZoI for operational air quality impacts and effects.

12.7.70 The air quality assessment (Appendix 8B: Air Quality – Operational Phase, PEI Report, Volume III) identifies potential for an adverse effect from nutrient nitrogen deposition on the wet and dry heathland habitats for which the SSSI/SAC is designated. Operational stack emissions from the Proposed Development will result in a 0.12 kg N/ha/yr deposition on the North York Moors SSSI/SAC. With reference to this and the minimum critical nitrogen load for the heathland habitat components listed in the Air Pollution IInformation System (APIS) database (10 kg N/ha/yr) this indicates that the Proposed Development would contribute approximately 1.2% of the critical load for wet and dry heaths respectively. Guidance from the Institute of Air Quality Management clarifies that the 1% threshold is not intended to be precise to a set number of decimal places but to the nearest whole number (paragraph 5.5.2.6 of Institute of Air Quality Management, 2020). As such, the 1% threshold for deeming effects insignificant is not breached. There is no potential for an adverse effect on the other designated habitat feature of the SSSI/SAC i.e. blanket bog. While this habitat has a high nitrogen

sensitivity it only occupies a small proportion of the SAC south of Kildale and therefore lies beyond the distance for which the Proposed Development would result in any meaningful nitrogen deposition.

12.7.71 While not an interest feature of the SAC, the SSSI is also designated for its fen, marsh and flush habitats. These habitats are often small-scale but are considered an essential part of the designated moorland habitat interest e.g. for their importance in sustaining rich invertebrate assemblages. The location of these habitats within this large SSSI (44,087 ha) are not mapped in MAGIC, but Natural England has recently commissioned update surveys for alkaline fen and transitional mire habitats (Eades *et al.* 2018) and this is likely to be representative of the locations of this interest feature. Based on this report, the closest fen habitats are located at Low Moor and Scarth Wood Moor. These locations are well beyond the distance required for assessment of air quality impacts and effects, and on this basis no further assessment of fen, marsh and flush habitats is required.

12.7.72 As the nitrogen deposition doses for heathland habitats do not exceed 1% of the critical load for these habitats, there is **no potential for a significant effect** on the integrity of the SSSI/SAC.

Durham Coast SAC and SSSI

12.7.73 Durham Coast SAC (also a SPA and Ramsar site for bird features only and referred to as Northumbria Coast SPA and Ramsar site, for assessment of which see Chapter 15: Ornithology and Appendix 15D HRA LSA Screening Report) is located 14.5 km northwest of the PCC. While the SAC overlaps with the SSSI it does not fully encompass it, such that the SSSI includes additional land located 12.7 km northwest of the PCC.

12.7.74 Durham Coast SAC is not identified on APIS as being sensitive to nitrogen or acid deposition and no critical loads are available for this site on which to base an assessment of the designated vegetated sea cliff habitat interest. However, the closest part of the SAC is located within Units 41 and 43 of the SSSI and is known to support calcareous and dune grasslands. These are also the closest units of the SSSI to the Proposed Development. The APIS habitat Sub-atlantic semi-dry calcareous grassland has therefore been used as the basis for assessment. The interest features of Durham Coast SAC and SSSI are not sensitive to acid deposition according to APIS.

12.7.75 The air quality assessment (Appendix 8B: Air Quality – Operational Phase, PEI Report, Volume III) indicates that nitrogen deposition doses do not exceed 1% of the critical load for calcareous grassland habitats. There is **no potential for a significant effect** on the integrity of the SSSI/SAC.

Teesmouth and Cleveland Coast SSSI (incorporating Teesmouth NNR)

12.7.76 Teesmouth and Cleveland Coast SSSI (also a SPA and Ramsar site for bird features only, for assessment of which see Chapter 15: Ornithology (PEI Report, Volume I) and Appendix 15D: HRA LSA Screening Report (PEI Report, Volume III)) is the closest statutory designation to the Proposed Development, being 8 m north of the PCC. Part of the SSSI is also designated as an NNR for habitats otherwise covered by the SSSI

designation. The NNR is located at greater distance, being 400 m to the north of the PCC.

12.7.77 The air quality assessment (Appendix 8B: Air Quality – Operational Phase, PEI Report, Volume III) identifies a potential significant effect from operation of the PCC.

12.7.78 Nitrogen deposition doses to the sand dunes at the closest point of Teesmouth and Cleveland Coast SSSI (Coatham Sands, known as Site 1000178 South Gare and Coatham Sands in APIS) to the PCC site would be 2.3 kg N/ha/yr. This is a large deposition, equivalent to 29% of the critical load for the most sensitive type of dune system (fixed dune grassland communities, with a minimum critical load of 8 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. Nitrogen doses to the majority of Coatham Sands, the predominant sand dune system in both Redcar and Cleveland and the SSSI (129 ha/ 70% of the total area of 184 ha within the SSSI cited in Natural England, 2018), would be at least 0.25 kg N/ha/yr. While this is much reduced in comparison with the worst-case dose received by the SSSI, it is still equivalent to 3% of the critical load for the relevant habitats. There are no interest features at Coatham Sands that are recorded in APIS as being sensitive to acid deposition.

12.7.79 According to the most recent condition assessment made by Natural England, the SSSI unit encompassing Coatham Sands is in favourable condition. The predicted nutrient nitrogen deposition is likely to be detrimental because it would increase growth by tall grass species at the expense of less competitive plant species (which are usually those species of greatest nature conservation interest), increased nitrogen leaching, soil acidification and loss of typical lichen species (if present). As a result of these impacts, there may be a shift in vegetation community composition and habitats may become less suitable for certain key species for which the SSSI is designated e.g. notable flora and terrestrial invertebrates. As a worst-case assessment, sensitive vegetation communities and species could be lost or experience decline, with implications for the maintenance of favourable condition.

12.7.80 Pending further air quality and ecological assessment with reference to botanical survey data to be collected in summer 2020 and reported in the final ES, it is assumed that the operation of the PCC has the potential to result in a **significant effect (major adverse)** on the integrity of the SSSI at the National level.

12.7.81 This is an initial preliminary precautionary conclusion. Engineering design, modelling and technical assessment is ongoing and this is likely to necessitate substantive review of the initial assessment of potential air quality impacts and effects. This will be provided in the ES.

Lovell Hill Pools SSSI

12.7.82 Lovell Hill Pools SSSI is located 6.2 km southeast of the PCC and is designated for its outstanding assemblage of dragonflies and damselflies. The air quality assessment (Appendix 8B, PEI Report, Volume III) cannot rule out a potential adverse effect on the SSSI from nutrient nitrogen and

acid deposition because APIS does not assign critical loads to permit air quality modelling and assessment of this.

12.7.83 Natural England has not undertaken a condition assessment of the SSSI since 2009, when it was assessed that the SSSI was in 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.

12.7.84 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 atmosphere.

12.7.85 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.

Saltburn Gill SSSI

12.7.86 Saltburn Gill SSSI is located 10.4 km southeast of the PCC. A potential air quality impact has been identified for this site (Appendix 8B: Air Quality – Operational Phase, PEI Report, Volume III), as nutrient nitrogen deposition from the Proposed Development is 2% of the critical load given in APIS for the relevant broad-leaved mixed and yew woodland interest feature of the SSSI (15 kg N/ha/yr), and the total nitrogen deposition dose at the site would exceed the critical load.

12.7.87 The most recent Natural England condition assessment (July 2009) indicates the SSSI is in favourable condition. While the impact from the Proposed Development is not likely to affect the extent or integrity of the woodland as whole it has potential to influence (alter) the botanical species composition and structure within the ground flora of the woodland with possible implications for maintenance of favourable condition.

12.7.88 The setting of the SSSI can be expected to ameliorate the potential impact to woodland ground flora to some degree, something that has not been considered in the air quality model. APIS advises that "*Woodlands provide a rough surface and tend to intercept larger amounts of both dry deposited nitrogen and orographic deposition than less rough surfaces, e.g. grasslands. This is particularly the case for woodland edges, which experience the highest nitrogen deposition. Thus, there is often a gradient of nitrogen deposition declining from the woodland edge*". This is relevant as the SSSI woodland is encompassed within and buffered by a larger area of woodland that is not subject to the SSSI designation. On the side of the SSSI closest to the Proposed Development, this buffer of surrounding

woodland is upwards of 50 m wide. Given this, nitrogen doses to the SSSI are likely to be lower than modelled, and therefore the model is overly conservative. The effect on woodland ground flora from nitrogen depositon would therefore be reduced and is likely to be localised rather than affecting the integrity of the woodland as a whole.

12.7.89 Taking the above into consideration and pending further assessment, it is considered that the nitrogen deposition dose to woodland plant communities has potential to result in a **significant effect (moderate adverse)** at the Borough to County level.

12.7.90 This is an initial preliminary precautionary conclusion. Engineering design, modelling and technical assessment is ongoing and this is likely to necessitate substantive review of the initial assessment of potential air quality impacts and effects. This will be provided in the ES.

Local Nature Conservation Designations

Eston Pumping Station LWS

12.7.91 Potential air quality impacts (Appendix 8B: Air Quality – Operational Phase, PEI Report, Volume III) have been assessed with reference to the most sensitive habitats with potential to occur (calcareous grassland). This assessment is considered worst case and potentially overly precautionary given the habitat context and current condition of the LWS is poorly understood. The only information available indicates that the LWS is designated for its "*mosaic of habitats and borderline neutral urban grasslands*", and therefore use of worst-case critical loads for calcareous grassland may not be justified. Redcar and Cleveland Council was contacted for further information but was unable to provide further clarification on the habitat conditions present and reasons for designation.

12.7.92 The air quality assessment identifies no potential operational air quality impacts on Eston Pumping Station LWS since total NOx and ammonia concentrations, and nitrogen deposition doses do not exceed the critical level or critical load. There is **no potential for a significant adverse effect**.

Coatham Marsh LWS

12.7.93 This designation is located 600 m east of the PCC. The air quality assessment (Chapter 8: Air Quality, PEI Report, Volume I) identifies a potential air quality impact on at least one of the habitats for which the LWS is designated. This is because nutrient nitrogen dose from the Proposed Development is predicted to considerably exceed 1% of the critical load given in APIS for the most sensitive habitats with potential to occur (calcareous grassland) and with this contribution the total nitrogen deposition rate would achieve 100% of the critical load. This deposition may result in changes to the structure and species composition of some of the habitats for which the site is designated.

12.7.94 Pending further assessment, it is assumed that impacts resulting from deposition of nutrient nitrogen has potential to produce a **significant effect (moderate adverse)** at up to the County level.

12.7.95 This is an initial preliminary precautionary conclusion. Engineering design, modelling and technical assessment is ongoing and this is likely to necessitate substantive review of the initial assessment of potential air quality impacts and effects. This will be provided in the ES.

Species

Bats

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

12.7.97 At the location of the PCC, surveys recorded only low levels of activity by common bat species (mainly common pipistrelle, but also soprano pipistrelle and noctule). 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 land required for the PCC, 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 land required for the PCC.

12.7.98 Given the existing baseline, external lighting of the PCC is not likely to affect the conservation status of any bat species. Indeed, the new landscaping (particularly screening plantings of trees and shrubs) that would accompany the Proposed Development provides an opportunity to improve habitat quality in the local area for foraging bats, and such improvements are likely to outweigh any localised deterrent effect from new lighting. A commitment remains (Chapter 4: Proposed Development, PEI Report, Volume I) to provide a sensitive external lighting scheme with the final ES regardless of the potential implications of lighting at the PCC for bats.

12.7.99 The effect on bats from external lighting required for operation of the Proposed Development is assessed as **not significant (neutral)**.

Decommissioning

12.7.100 The potential for adverse decommissioning impacts and effects on relevant terrestrial ecology features is limited by the nature of the proposed decommissioning activities. Decommissioning will remove all above ground infrastructure, but 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.

This will avoid direct impacts on the sand dune system of Teesmouth and Cleveland Coast SSSI, as well as other habitats of current or potential future biodiversity value.

12.7.101 Requirements to remove above ground infrastructure means that decommissioning activities would be predominantly restricted to within the built footprint of the Proposed Development. Therefore, in most cases decommissioning activities will be able to avoid vegetated areas or otherwise would only affect localised areas of vegetation immediately adjacent to built infrastructure. This would limit the potential for impacts 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 for, or otherwise managed within the context of, the Proposed Development. Some of this vegetation could have established a biodiversity value that would need to be addressed during decommissioning in accordance with planning policy and legislation at that time e.g. for a value for protected species. 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.

12.7.102 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.

12.7.103 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.

12.7.104 This is discussed further within Chapter 4: Proposed Development (PEI Report, Volume I).

12.7.105 On this basis, and at the PEI stage, there are no significant effects anticipated as a result of the decommissioning phase of the Proposed Development.

12.8 Mitigation and Enhancement Measures

Construction Mitigation

Teesmouth and Cleveland Coast SSSI

12.8.1 A habitat reinstatement and aftercare strategy, taking account of the results of surveys being completed in 2020, will be prepared and agreed with Natural England prior to submission of the ES and will set out the measures

required to re-establish habitats to an appropriate condition and maintain populations of relevant species including notable flora, terrestrial invertebrates and common lizard. The overlap with Chapter 15: Ornithology is acknowledged and will be fully addressed by the strategy.

12.8.2 Once agreed, the strategy would be enacted in full. Works would continue until ecological monitoring has demonstrated that the objectives of the strategy have been achieved and this has been signed off with Natural England.

12.8.3 With agreement and implementation of an appropriate strategy it is considered that a permanent adverse effect on the integrity of the SSSI and the conservation status of its dependent species could be avoided. Similar works were approved and are considered (see the consultation response from Natural England in Table 12-4) to have been implemented successfully for a previous scheme known as Breagh Pipeline.

12.8.4 However, before this can be confirmed, further consideration needs to be given to the relative magnitude of the Breagh Pipeline on the SSSI and the comparability of the habitats affected. It is possible that the Breagh Pipeline route was of relatively lower sensitivity than the routes being considered for the Proposed Development. Similarly, aerial imagery indicates that the topography of the dune system along the alignment of the Breagh Pipeline was not reinstated to a condition comparable with the adjacent dune system, and this may be material to habitat reinstatement requirements for the Proposed Development and the feasibility of these requirements.

12.8.5 This will be assessed and confirmed in the ES. Given current uncertainties, an initial preliminary precautionary assumption must be maintained that it may not be possible to mitigate all of the impacts and effects of the Proposed Development on the SSSI and its designated habitat and species interest features.

Habitats

12.8.6 Requirements for reinstatement of habitats subject to temporary disturbances during construction will be identified in the final ES, based on consideration of requirements of landowners, the baseline habitat conditions, and priorities for nature conservation on a location by location basis e.g. grassland and scrub habitats may not need to be reinstated if this can be left to natural processes and if it allows beneficial OMH to be delivered in the interim.

Great Crested Newt

12.8.7 Appropriate, legally compliant, mitigation for great crested newt (if present) will be specified based on the results of the further surveys in 2020 and the final design. This will be provided in the ES.

12.8.8 Where practicable all ponds will be retained. Where losses of ponds supporting great crested newt cannot be avoided then a European Protected Species Mitigation Licence (EPSML) would be obtained to permit this. If necessary, update surveys would be undertaken to obtain current data to support an application for a licence.

12.8.9 In the absence of pond loss, an adverse effect on the conservation status of great crested newts is unlikely. Only a very small proportion of available terrestrial habitat would be disturbed during construction, the effects of this would be temporary, and habitats would be reinstated on completion of construction works. However, the welfare requirements of great crested newt would still need to be met to ensure legal compliance. Given this, all construction works affecting terrestrial habitats suitable for great crested newt would be subject to a Precautionary Working Method Statement (PWMS) approach supervised by an ECoW.

12.8.10 A draft PWMS will be provided with the ES. This would be reviewed, updated and agreed with stakeholders prior to the start of construction.

Otter

12.8.11 It is not certain that works cannot be timed to avoid the season when otters are most likely to be resident along the relevant section of the River Tees. Therefore, pending the results of further survey, it is considered that there is potential for riverbank otter holts and lying-up sites to be present at the time of construction. The following mitigation would be employed to address this risk:

- Structures and habitats potentially suitable for otter holts or for lying-up would be re-surveyed prior to the start of construction, to allow appropriate mitigation to be specified and agreed in advance of construction works starting. Where feasible this survey would be undertaken at least 6 months prior to the start of construction, to provide sufficient lead-in time in the event that a EPSML is required; and
- Even should a licence not be required, all construction works on the banks of the River Tees would be completed under Precautionary Working Method Statement (PWMS), the requirements of which would be specified by an appropriately experienced ecologist. All relevant works would be supervised by an ECoW.

Bats

12.8.12 All buildings requiring construction-related demolition works would be reassessed for their suitability for use by roosting bats. 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.

12.8.13 If bat roosts are found through the above work, then a BLiCL or EPSML would be applied for from Natural England to permit demolition works to proceed. Demolition would only proceed once all necessary licences are in place, and associated mitigation requirements (e.g. provision of replacement roosts) have been met.

Common lizard

12.8.14 Only a very small proportion of available common lizard habitat would be disturbed during construction, the effects of this would be temporary, and habitats would be reinstated on completion of construction works. However, the welfare requirements of common lizard would still need to be met to ensure legal compliance. Given this, all construction works affecting habitats

suitable for common lizard would be subject to a Precautionary Working Method Statement (PWMS) approach supervised by an ECoW.

12.8.15 A draft PWMS will be provided with the ES. This would be reviewed, updated and agreed with stakeholders prior to the start of construction.

General Animal Welfare during Construction

12.8.16 Construction excavations have potential to trap wildlife and may result in offences under animal welfare legislation. All excavations associated with both the PCC and the connection corridors that are deeper than 1 m would be covered overnight, or where this is not practicable, a means of escape would be fitted e.g. battered soil slope or scaffold plank, to provide an escape route should any animals (e.g. badger, otter, brown hare, hedgehog) stray into the construction site and fall into an excavation.

Invasive Species Management

12.8.17 An ISMP would be prepared to accompany the CEMP and would be agreed with relevant stakeholders. The ISMP would specify the measures and supervision necessary during construction to prevent the spread of the controlled weed species to new locations. An invasive non-native plant survey would be undertaken prior to construction to determine the current location and extent of invasive plant stands, and to inform specification of the ISMP.

Operation Mitigation

Emissions

12.8.18 Engineering design, modelling and technical assessment is ongoing to identify technological solutions that would minimise operational emissions at source and by so doing mitigate the potential for adverse effects on nature conservation designations. Once this process is exhausted, ecological mitigation options will be identified through consultation with relevant stakeholders e.g. options to offset increased nutrient deposition through enhanced habitat management regimes. This will be provided in the ES.

Decommissioning Mitigation

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

Enhancement

12.8.20 An outline Landscape and Biodiversity Strategy would be developed in consultation with stakeholders and provided with the final ES. This would set out biodiversity enhancement proposals and the habitat management prescriptions necessary to deliver these.

Ecological Monitoring

12.8.21 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 construction phase would be set out in the CEMP. In particular, an Ecological Clerk of Works would be employed to oversee the delivery of all necessary mitigation, including any mitigation to be completed under protected species mitigation licences.

12.8.22 Monitoring may also be necessary for a certain period during operation to confirm successful establishment and management of habitats reinstated or enhanced during/after construction. As a minimum, such monitoring would be undertaken within Teesmouth and Cleveland Coast SSSI if open cut construction methods are used to cross the SSSI. Monitoring requirements would be discussed and agreed with relevant stakeholders and would be specified in the outline Landscape and Biodiversity Strategy submitted with the ES.

12.9 Residual Effects

Construction and Decommissioning

Teesmouth and Cleveland Coast SSSI

12.9.1 Pending consultation and agreement with Natural England that all relevant temporary construction impacts and effects on the SSSI can be mitigated, and that such mitigation is technically feasible, it remains necessary to maintain an initial preliminary precautionary assumption that there is potential for a **significant (moderate adverse)** residual effect on the integrity of the SSSI and the conservation status of designated habitat and species interest features. This will be reviewed, and the assessment confirmed in the ES.

Grassland Habitats

12.9.2 While the details of the mitigation measures to be provided to address localised permanent losses of grassland requires further specification (this will be provided in the ES) the composition of the affected grasslands and their secondary origins indicates that mitigation is feasible in a reasonable timeframe (5 to 10 years) and that there can be confidence in its successful delivery. In addition, wider commitments to provide biodiversity enhancement can also deliver habitat gains suitable to offset any localised permanent losses of grassland.

12.9.3 With the committed mitigation, the worst-case residual effect on grassland habitats is assessed as **not significant (neutral)**.

Potential Bat Assemblage at Coatham Sands

12.9.4 Pending completion of surveys in September 2020, it is assumed that there is potential for a foraging bat assemblage of up to county value to occur in association with the complex of wetland habitats present at Coatham Sands. Maintenance of this assemblage would require maintenance of suitable habitat conditions, and this in turn is likely to be dependent on the

maintenance of suitable ground water regimes. The implications of potential open cut methods during construction of the CO_2 Export Pipeline and the Water Discharge Pipeline on ground water regimes within Coatham Sands is subject to ongoing hydrological assessment and will be reported in the ES.

12.9.5 Chapter 9: Hydrology and Water Resources (PEI Report, Volume I) states that it is not currently known how these wetland habitats are fed, and whether the Proposed Development would impact existing groundwater flow directions or volumes. This will be determined through further hydrological investigation and reported in the ES. Given this uncertainty, it is not known whether the effects of open cut construction measures on wetland habitats would be temporary, or whether there might be a permanent impact on the hydrology and therefore structure and function of existing wetland habitats for bats

12.9.6 Pending the completion of bat activity surveys at Coatham Sands and further hydrological assessment it is assumed that there is potential for an adverse residual effect on bats from permanent loss or degradation of foraging habitats that is **significant (moderate adverse)** at the County level. This is an initial preliminary precautionary conclusion and is subject to further review and confirmation. This will be provided in the ES.

Operation

12.9.7 Pending further engineering design, modelling and technical assessment it is considered that there is potential for the following nature conservation designations to experience significant adverse air quality effects as a result of operation of the Proposed Development:

- Teesmouth and Cleveland Coast SSSI (major adverse)
- Saltburn Gill SSSI (moderate adverse); and
- Coatham Marsh LWS (moderate adverse).

12.9.8 This is an initial preliminary precautionary conclusion. Engineering design, modelling and technical assessment is ongoing and this is likely to necessitate substantive review of the initial assessment of potential air quality impacts and effects. This will be provided in the ES which will accompany the DCO application.

12.9.9 No other significant residual operational effects are predicted as a result of operation of the Proposed Development.

12.10 Limitations or Difficulties

12.10.1 Baseline conditions and relevant ecological features have been determined using appropriate methods. Further baseline surveys are required for certain habitats and species in Spring/Summer 2020 (as identified in Appendix 12C: Preliminary Ecological Appraisal report, PEI Report, Volume III) in order to collect data to complete the assessment of likely impacts and effects of the Proposed Development. This work would be completed to allow relevant survey data and assessment to be provided with the ES. Where some surveys have not been completed it has been necessary to assume that

certain protected species are present and that these populations are of the maximum likely nature conservation value.

12.10.2 For the purposes of this assessment and pending further information on the layout of the PCC, it is assumed that all semi-natural habitats present within the PCC would be lost during construction.

12.10.3 In contrast, the connection corridors have been broadly defined to allow flexibility on the selection of final connection routes and methods. 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 e.g. use of existing pipeline racks to prevent new land take. The parameters for this are defined in Chapter 4: Proposed Development and Chapter 5: Construction and Management (PEI Report, Volume I). 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. The parameters for and extent of habitat reinstatement requires further design and agreement and will be provided in the final ES.

12.10.4 The preliminary stack height assessment indicates that there is potential for significant operational air quality impacts at some designated sites. In this assessment, worst-case assumptions have been made (see section 12.2.11 regarding use of the Rochdale Envelope) based on available information. As engineering design, modelling and technical assessment is ongoing, this is likely to necessitate substantive review of the initial assessment of potential air quality impacts and effects. This will be provided in the ES.

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

12.11 Conclusions

12.11.1 Pending further assessment to be provided in the ES, there is potential for significant adverse effects on the following ecological features:

- Teesmouth and Cleveland Coast SSSI - major adverse effect due to temporary habitat loss and disturbance during construction and nutrient nitrogen deposition during operation;
- Saltburn Gill SSSI - moderate effect due to nutrient nitrogen deposition during operation;
- Coatham Marsh LWS - moderate adverse effect due to nutrient nitrogen deposition during operation; and
- Potential bat assemblage at Coatham Sands – moderate adverse effect due to losses of optimal foraging habitats (wetland habitats).

12.11.2 Engagement is ongoing with Natural England in relation to requirements to reduce construction impacts on Teesmouth and Cleveland Coast SSSI and

to restore habitats to ensure no permanent effect on the integrity of the SSSI and its sand dune habitats.

12.11.3 No other terrestrial ecological features are likely to experience adverse residual effects as a result of construction, operation and decommissioning of the Proposed Development. Opportunities to secure benefits for biodiversity as a direct consequence of the Proposed Development will be considered further and reported in the ES.

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