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13. Aquatic Ecology

13.1 Introduction

13.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects on the Proposed Development on aquatic ecology features.

13.1.2 This initial aquatic ecology assessment of likely significant effects considers:

- the present-day and future baseline conditions within the Site;
- the predicted temporary effects of construction of the Proposed Development on habitats and species, with respect to construction traffic, construction dust and the Proposed Development;
- the predicted permanent / long-term effects of the operation and maintenance of the Proposed Development on habitats and species; and
- the potential effects of decommissioning of the Proposed Development on habitats and species.

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

- Appendix 13A – Aquatic Ecology Planning Policy and Legislation;
- Appendix 13B – Aquatic Ecology Impact Assessment Methodology;
- Appendix 13C – Aquatic Desk Based Assessment.

13.2 Legislation and Planning Policy Context

13.2.1 This initial assessment of likely significant effects had been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. A summary of these are provided below, and further details are included in Appendix 13A: Aquatic Ecology Planning Policy and Legislation (PEI Report, Volume III).

Legislative Background

13.2.2 The following legislation is considered relevant to the Proposed Development in relation to aquatic ecology interest features:

- The Water Framework Directive (WFD; EC Directive 2000/60/EC);
- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- Ramsar The Convention on Wetlands;
- The Conservation of Habitat and Species Regulations 2017 (the Habitats Regulation);

- Natural Environment and Rural Communities (NERC) Act 2006 (as amended);
- The Bern Convention (1979);
- The Marine and Coastal Access Act (2009);
- The Salmon and Freshwater Fisheries Act (1975); and
- The Eels (England and Wales) Regulations 2009.

National Planning Policy

13.2.3 The overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011) sets out national policy for energy infrastructure. Part 5.3 relates to biodiversity and states that where development is subject to Environmental Impact Assessment (EIA), the Environmental Statement (ES) should clearly set out the effects on internationally, nationally and locally designated nature conservation sites, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. It also requires that the applicant shows how the project has taken advantage of opportunities to conserve and enhance biodiversity.

13.2.4 The UK Government has committed to halting the overall decline in biodiversity. Planning policy support for this is set out in the National Planning Policy Framework (NPPF) published by the Ministry for Housing, Communities and Local Government in February 2019. While the NPPF does not directly apply to nationally significant infrastructure projects (NSIPs), such as the Proposed Development, it may be a relevant factor in their determination. The forthcoming Environment Bill will mandate biodiversity net gain for development (housing and commercial) but NSIPs will remain out of the scope for mandatory net gain in this Bill.

13.2.5 The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. It specifies the obligations that Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation, and how this is to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where an impact is unavoidable, compensation may be required.

Local Development Plan Policy

13.2.6 Local planning policy relevant to ecology and nature conservation is set out in the Redcar and Cleveland Local Plan (2018) and Stockton-on-Tees Local Plan (2019) which set out a long-term vision for managing growth and development in the area.

13.2.7 Policy N4 (Biodiversity and Geodiversity) of the Redcar and Cleveland Local Plan (2018) relates to the protection of statutory and non-statutory

designated sites, biodiversity features and the Redcar and Cleveland Borough's ecological network. The policy also sets out protection of ecological features of value as wildlife corridors and other habitat networks such as river corridors. The River Tees and neighbourhood water courses provide an important role as wildlife corridors. The biodiversity and habitat of water courses should be maintained and enhanced, and opportunities sought to improve the water environment.

13.2.8 Policy ENV5 of the Stockton-on-Tees Local Plan aims to preserve, protect and enhance ecological networks, biodiversity and geodiversity within the Borough of Stockton-on-Tees. The policy promotes restoring and recreating priority habitats and the recovery of priority species.

Other Guidance

13.2.9 In July 2012, the UK Post-2010 Biodiversity Framework was published by the Joint Nature Conservation Committee and the Department for the Environment, Food and Rural Affairs (Defra). This covers the period from 2011 to 2020 and forms the UK Government's response to the UN Convention on Biological Diversity held in Nagoya in 2010. Following publication of the Framework, most of the strategic biodiversity work previously enacted under the UK Biodiversity Action Plan was delegated to each of the four countries comprising the United Kingdom of Great Britain and Northern Ireland. The Framework shows how the work of the four UK countries joins up to achieve the international biodiversity targets agreed under the UN Convention, as well those required under the European Union biodiversity strategy.

13.2.10 In England, the strategic approach to be taken in biodiversity planning over the period from 2010 to 2020 is set out in '*Biodiversity 2020, A strategy for England's wildlife and ecosystem services*' (Defra, 2011). These country strategies replace the UK Biodiversity Action Plan, with the associated lists of priority habitats and species carried over into the newly defined lists of habitats and species of principal importance for nature conservation in England listed pursuant to Section 41 of the NERC Act. This latter list encompasses 56 habitats and 943 species.

13.2.11 The Tees Valley Biodiversity Action Plan provides information on the local biodiversity action plan priority habitats and species across both Stockton-on-Tees and Redcar and Cleveland. The BAP targets priority aquatic habitats such as ponds, lakes, reservoirs, rivers and streams. These aquatic environments have the potential to provide important habitat for priority species including water violet (*Hottonia palustris),* bullhead (*Cottus gobio*), salmon (*Salmo salar*), brown trout (*Salmo trutta*), European eel (*Anguilla anguilla*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*).

13.2.12 Standing advice has been published by Natural England and Defra to guide decision-makers on the determination of proposals with the potential to affect designated sites, species and habitats. This advice is available from a number of sources, including within the citations for individual designated sites and via Natural England's 'Designated Sites System' – DSS (Natural England, 2020). The guidance sets out responsibilities and minimum

requirements for survey and mitigation, including the need to engage with objectives for no net loss of biodiversity and provision of biodiversity net gain.

13.3 Assessment Methodology and Significance Criteria

Use of the Rochdale Envelope

13.3.1 The construction details of some components of the Proposed Development have not been established. In order to ensure a robust assessment of the likely significant environmental effects of the Proposed Development, the PEI Report is being undertaken adopting the principles of the 'Rochdale Envelope'.

13.3.2 This involves assessing the maximum (or where relevant, minimum) parameters for the elements where flexibility needs to be retained (building dimensions for example). Justification for the need to retain flexibility in certain parameters is also outlined in this chapter and in Chapter 6: Need, Alternatives and Design Evolution (PEI Report, Volume I).

Construction Scenario – Worst Case

13.3.3 The construction of one power and capture train, and all connection corridors, followed by the immediate and sequential build of the remaining trains comprise the peak construction period and have the potential for the greatest magnitude of change to aquatic habitats and species.

13.3.4 The timing and duration of construction has the potential to impact on aquatic habitat and species as they have important seasonal preferences for sensitive life stages.

13.3.5 As a worst-case, the use of open-cut trench construction rather than trenchless technologies, is assumed to be adopted to install the Abstraction and Discharge Corridors and the CO_2 Export Pipeline through Coatham Dunes and Coatham Sands and other areas within the proposed Site boundary. This would comprise the worst case scenario for aquatic habitats and species resulting in temporary habitat disturbance.

Operational Scenario – Worst Case

13.3.6 The worst-case scenario is the operation of all three power and capture trains of the Proposed Development that has the potential to have the greatest magnitude of change to aquatic habitats and species.

Decommissioning Scenario – Worst Case

13.3.7 It is assumed that pipeline structures will be left *in situ*, however if removed, there is the potential to temporarily impact aquatic habitats and species during the decommissioning of the Proposed development.

Approach

13.3.8 The initial assessment of likely significant effects presented in this chapter has been undertaken in accordance with the Charted Institute of Ecology

and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2018). Full details of the approach applied are provided in Appendix 13B: Aquatic Ecology Impact Methodology in PEI Report, Volume III with an abridged overview provided below. The aims of this chapter of the PEI Report will be to:

- define the Study Area for the assessment, which considers the Zone of Influence (ZoI) of the Proposed Development;
- undertake desk and field-based assessments to identify relevant ecological features (i.e. designated sites, habitats and species) to determine the ecological baseline for the Site within the study area;
- determine the nature conservation importance of each ecological feature recorded during the desk and field-based assessments to determine which of those features are Important Ecological Features (IEFs) in the context of the Ecological Impact Assessment (EcIA).

13.3.9 The following aims are not addressed in this PEI Report but will be assessed in the EcIA prepared for the Environmental Statement (ES):

- provide a robust assessment of the likely impacts on IEFs and resultant effects of the Proposed Development, which may be beneficial (i.e. positive) or adverse (i.e. negative);
- design suitable avoidance and mitigation measures to address potential impacts in line with legal requirements relating to IEFs;
- determine the significance of any residual effects and design suitable compensation measures to address significant residual effects; and
- identify opportunities for biodiversity enhancements.

Important Ecological Features

13.3.10 It is not necessary in the assessment to address all habitats and species with potential to occur in the ZoI of a proposed development. Instead, the focus should be on those that are 'relevant'. CIEEM guidance makes it clear that there is no need to "*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*". This does not mean that efforts should not be made to safeguard wider biodiversity and requirements for this have been considered.

13.3.11 The overarching National Policy Statement for Energy (NPS EN-1) (DECC, 2011) sets out national policy for energy infrastructure. Part 5.3 relates to biodiversity and states that where development is subject to EIA, the ES should clearly set out the effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, protected species and habitats and other species identified as being of principal importance for the conservation of biodiversity. It also requires that the applicant shows how the project adheres to the Government's biodiversity strategy which aims to ensure:

- "*A halting, and if possible a reversal, of declines in priority habitats and species, with wild species and habitats as part of healthy, functioning ecosystems*; and
- *The general acceptance of biodiversity's essential role in enhancing the quality of life, with its conservation becoming a natural consideration in all relevant public, private and non-governmental decisions and policies*" (paragraph 5.2.18 of NPS EN-1).

13.3.12 This must be demonstrated through robust application of the mitigation hierarchy and can achieved by the application of appropriate mitigation to ensure that:

- the footprint of construction activities is reduced as far as practicable;
- construction and operation best practice is adhered to in order to minimise disturbance to marine habitats and species;
- restoration of habitats is carried out where loss and physical disturbance cannot be avoided; and
- opportunities are sought to conserve and enhance biodiversity.

13.3.13 Where appropriate mitigation cannot be applied, it would be expected that requirements would be attached to the Development Consent Order (DCO) consent and / or any planning obligations entered into.

13.3.14 The EcIA will not carry out detailed assessments of features that are sufficiently widespread, unthreatened and resilient to impacts and which will remain viable and sustainable should the Proposed Development proceed.

13.3.15 To support the EcIA, there is a need to determine the scale at which aquatic ecological features (habitats, species, ecosystems and their functions/ processes) identified through the desk studies and field surveys are of value in the Study area. The value of each ecological feature has been, or will be where identified in subsequent field surveys, defined with reference to the geographical level at which it is significant, and the results of this assessment have been used to identify the relevant features requiring impact assessment. The frames of reference used for this assessment, based on CIEEM guidance, are:

- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
- National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
- Regional (North East);
- County (Teesside);
- District (Stockton on Tees, Redcar and Cleveland);
- Local or Site (ecological features that do not meet criteria for valuation at a District or higher level, but have value at site level and relevant to considerations of No Net Loss); and

- Negligible (has minor value at the Site level but if lost would not conflict with targets for No Net Loss).

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

- impact – actions resulting in changes to an ecological feature. For example, construction of a bridge pier upstream of salmonid spawning habitat, resulting in altered hydrology and increased sedimentation and;
- effect – outcome resulting from an impact acting upon the conservation status or structure and function of an ecological feature. For example, reducing suitable spawning habitat due to increased sedimentation as well as smothering eggs during breeding season, which may lead to an adverse effect on the population by reducing recruitment through diminished larval survival.

13.3.17 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. The likely duration of the impact should be quantified (e.g. 2 weeks duration; 5 to 10 years). Consideration has been given to how this duration relates to relevant ecological characteristics such as a species’ lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
- reversibility - i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and implementable. 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.

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

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

13.3.19 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).

13.3.20 The CIEEM approach described in Appendix 13B: Aquatic Ecology Impact Assessment Methodology (PEI Report, Volume III) broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology (PEI Report, Volume I). 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 13-1.

Table 13-1: Relating CIEEM Assessment Terms to those Used in Other PEI Report Chapters

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

Extent of Study Area

13.3.21 The Study Areas used in this assessment were defined with reference to the likely ZoI over which the Proposed Development may have potential to result in significant effects on relevant ecological features. It is important to recognise that the potential ZoI of the Proposed Development may vary over time (e.g. the construction ZoI may differ from the operational ZoI) and/ or depending on the individual sensitivities of the relevant ecological features.

13.3.22 This was taken into account when defining relevant Study Areas, and these are sufficient to address the potential worst-case ZoI of the Proposed Development on the relevant ecological features concerned. The extent of the Study Areas applied during the desk study are detailed within Table 13-2 and Table 13-3 and in Appendix 13C: Aquatic Desk Based Assessment (PEI Report, Volume III). In many cases, the actual likely ZoI of the Proposed Development as finally conceived and designed will be much less than the precautionary area considered when conducting the original desk studies and field surveys for the Proposed Development.

Sources of Information/Data

13.3.23 The ecological baseline has been determined by a desk study as summarised below. Field surveys are planned for February to April 2020 to continue to inform the EcIA.

Desk Study

13.3.24 A desk study was carried out to identify nature conservation designations, protected and notable habitats and species potentially relevant to the Site. The desk study reviewed data sources detailed in Table 13-2 and is reported in detail in Appendix 13C: Aquatic Desk Based Assessment report (PEI Report, Volume III).

13.3.25 Protected and notable habitats and species include those listed under Schedule 5 of the WCA; Schedule 4 of The Habitat Regulations listed in Annex II and V; 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 Red Data Books (RDB) and Lists but not protected by legislation. This is consistent with the requirements of relevant planning policy.

13.3.26 Records of invasive non-native species (INNS) of controlled weeds, 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 INNS has been applied to relevant ecological features when determining the likely significant effects of the Proposed Development, as the presence of INNS is generally detrimental for ecology, and conversely the removal of such species would usually be considered desirable and beneficial for ecology. Requirements for control are also driven by the WCA and related legislation. Therefore, while the INNS 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.

Field Surveys

13.3.27 The initial scope of works for necessary habitat and protected species surveys was informed by an initial aquatic walkover of the land within the proposed Site boundary in February 2020, as detailed within Appendix 13C: Aquatic Desk Based Assessment (PEI Report, Volume III).

Table 13-2: Desk Study Area and Data Sources

Ecological Feature	Study area	Data Sources	Date Accessed
International statutory nature conservation designations	10 km	Multi-Agency Geographic Information for the Countryside (MAGIC) website, Joint Nature Conservation Committee (JNCC) Website (UK Protected Sites) http://jncc.defra.gov.uk/.	November 2019
National statutory nature conservation designations	10 km	MAGIC website, Natural England website.	November 2019
Local non-statutory nature conservation designations	2 km	Environmental Records and Information Centre (ERIC) North-East.	January 2020
Protected and notable habitats and species	1 km	Tees Valley Local Biodiversity Action Plan (BAP), Teesmouth and Cleveland Local BAP, Stockton-on-Tees BAP.	January 2020
Ponds and rivers	200 m	1:25,000 Ordnance Survey maps, Aerial photographs (Google Earth), MAGIC website.	November 2019
Fish	2 km	Environment Agency data requests for the Tees area, including the National Fish Populations Database (NFPD), Environment Agency (2009) River Tees Salmon Action Plan.	November 2019
Aquatic invertebrates	2 km	Environment Agency data requests for the Tees area.	November 2019
Macrophytes	2 km	Environment Agency data requests for the Tees area.	November 2019
RHS	2 km	Environment Agency data requests for the Tees area.	November 2019

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

13.3.29 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.

13.3.30 The scope of field surveys undertaken to inform the EcIA is summarised in Table 13-3 below. Full details of the scope and methodology for each survey are provided in the relevant technical appendices, which are cross referenced in Table 13.3 as appropriate.

13.3.31 INNS will also be surveyed and reported in each of the Ecological survey reports Appendix 13D to F (to be finalised after the outstanding field surveys are complete).

Table 13-3: Field Surveys to be Completed in 2020

Ecological survey	Technical Appendix (Aquatic ecology Assessment)	Study area	Proposed survey date
Fish	13D [*to be completed after field surveys]*	Rivers, ditches and ponds within 200 m of the Site. Not including artificial waterbodies such as water storage ponds.	Spring/Summer 2020
Aquatic macroinvertebrates	13E [*to be completed after field surveys]*	Rivers, ditches and ponds within 200 m of the Site. Not including artificial waterbodies, such as water storage ponds.	Spring/Summer 2020
Macrophytes	13F [*to be completed after field surveys]*	Rivers, ditches and ponds within 200 m of the Site. Not including artificial waterbodies, such as water storage ponds.	Spring/Summer 2020

Consultation

13.3.32 Consultation has been undertaken prior to submission of the PEI Report, including a meeting with Natural England. A summary of the consultation responses relevant to ecology and nature conservation is provided in Table 13-4.

Table 13-4: Consultation Summary Table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Planning Inspectorate	April 2019 (EIA Scoping Opinion)	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 have been carried out across the full extent of the DCO Site. This is reported in detail within 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). As noted above, ongoing targeted surveys will be undertaken in summer 2020 to help further refine the baseline (whilst appreciating the operational restrictions due to COVID-19) and will be reported within the ES.
Planning Inspectorate	April 2019 (EIA Scoping Opinion)	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".*	Surveys are ongoing throughout 2020; this includes INNS. The results from the ongoing survey effort will be reported within the final ES and supporting appendices.
Planning Inspectorate	April 2019 (EIA Scoping Opinion)	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 documented quantified within the final ES.
Natural England	3rd April 2019 (meeting)	Pre-application engagement meeting held to discuss the progress on the ecological baseline and approach to EcIA.	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.

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Natural England	24th February 2020 (meeting)	Pre-application engagement meeting held to discuss the progress on the ecological baseline for freshwater and aquatic Ecology. Specifications for the planned 2020 surveys were also discussed.	As above, all advice provided will be taken into account during the development of the ecological baseline and the assessment of likely significant effects on aquatic ecology.

13.4 Baseline Conditions and Nature Conservation Importance

Existing Baseline

13.4.1 The ecological baseline relevant to the Site is summarised below. The baseline is based on the results of the desk study undertaken for the Study Area to inform this assessment of likely significant effects.

13.4.2 With regard to background data, 'recent' records are considered to be those no older than 5 years from the date of the desk study. Records outside of this period are historical and have only been reported where more recent records do not exist. Exceptions to this are detailed in the appropriate sections below.

13.4.3 Ecological features which are present or considered likely to be present within the Study Area have been assigned a geographical scale of nature conservation importance in line with the criteria detailed in Section 13.3. Nature conservation importance is summarised in Table 13-1.

13.4.4 Existing historical data is limited and therefore field-based surveys are scheduled for Spring/Summer 2020 to further inform the assessment. Where it is not possible to achieve 100% survey coverage for a habitat or species, the baseline conditions will be based on a reasonable precautionary approach.

13.4.5 Desk study results, including evaluation of the relative nature conservation value of identified ecological features is provided in Appendix 13C: Aquatic Desk Based Assessment (PEI Report, Volume III).

Designations

International Statutory Nature Conservation Designations within 10 km

13.4.6 The Statutory international nature conservations designations were identified within the Study area are listed below:

- Teesmouth and Cleveland Coast SPA; and
- Teesmouth and Cleveland Coast Ramsar.

National Statutory Nature Conservation Designations within 10 km

13.4.7 The following national nature conservation designations identified within the Study Area are units of the Teesmouth and Cleveland Coast SSSI and are no longer stand alone SSSI's, listed in order of distance from the Site:

- Cowpen Marsh SSSI – Within the Gas Connection Corridor and CO_2 Gathering Network to the west of the Tees;
- Seal Sands SSSI – Within the Gas Connection Corridor and CO_2 Gathering Network to the west of the Tees;
- South Gare and Coatham Sands SSSI – Within the Gas Connection Corridor and CO_2 Gathering Network the west of the Tees;
- Teesmouth National Nature Reserve – Within the proposed Site boundary;
- Eston Moor LNR – Within the proposed Site boundary;
- RSPB Reserve Salthome - Within the Site boundary;
- Seaton Dunes and Common SSSI – 0.3 km north of the Gas Connection Corridor and CO_2 Gathering Network to the west of the Tees;
- Seaton Dunes and Common LNR – 0.3 km north of the Gas Connection Corridor and CO_2 Gathering Network to the west of the Tees;
- Lovell Hill Pools SSSI – 1.6 km south-east of the proposed Site boundary;
- Redcar Rocks SSSI – 3 km west of the proposed Site boundary;
- Berwick Hills LNR – 3 km south-west of the Site boundary; and
- Errington Wood LNR – 3.5 km from the Site boundary to the south-east.

Non-Statutory Nature Conservation Designations within 2 km

13.4.8 Non-statutory designations of county nature conservation value were identified within the Study Area as follows:

- Greatham North LWS – within the proposed Site boundary;
- Greatham Creek North Bank LWS – within the proposed Site boundary;
- Greenabella Marsh LWS - within the proposed Site boundary;
- Phillip's Tank farm LWS - Adjacent to the proposed Site boundary to the north;
- Zinc Works Field LWS - 450 m north of the proposed Site boundary;
- Tot Fenney's Field LWS – 600 m north-west of the proposed Site boundary.

13.4.9 However, it is noted that none of these are designated for the presence of aquatic habitats, species or assemblages.

Habitats

13.4.10 The aquatic habitats associated with the Site are summarised below. The full results of the aquatic habitat desk-based study are provided in the Aquatic Ecology Assessment report (see Appendix 13C: Aquatic Desk Based Assessment, PEI Report, Volume III).

13.4.11 The PCC is dominated by existing disused buildings, plant, infrastructure and associated hard standing and bare ground areas associated with the former SSI Steelworks. There are natural, semi-natural and artificial (e.g. water storage reservoirs) water bodies within the site. The surrounding land use is a combination of industrial and urban areas and open land, much of which is designated as nature conservation sites.

13.4.12 The Discharge Corridor will use an existing route between the PCC and the North Sea. The proposed CO_2 Export Pipeline will pass close to several standing water bodies between the PCC and the North Sea. The Water Abstraction Corridor will use an existing route between the PCC and the mouth of the River Tees.

13.4.13 The Natural Gas Connection Corridor and the CO_2 Gathering Network cross several standing and running water bodies. The Electrical Connection Corridor is only present on the south bank of the River Tees and this corridor also crosses several standing and running water bodies.

13.4.14 Teesmouth and Cleveland Coast is designated as an SPA for internationally important marine and shore birds. Aquatic habitats are supporting habitats for birds and are therefore of value for the designated features of the SPA, so will still be considered in the assessment at the locations crossed by the Natural Gas Connection Corridor, CO_2 Gathering Network and the Water Connections Corridors. Other notified features of the SPA will be assessed in terms of value in Chapter 12: Terrestrial Ecology and Nature Conservation; and, Chapter 15: Ornithology (PEI Report, Volume I).

13.4.15 Teesmouth and Cleveland Coast is designated as a Ramsar site for internationally important marine and shore birds, including breeding and wintering populations of waterfowl. In addition, the Ramsar site is designated for its broad range of freshwater, marsh, intertidal and sand dune habitats which support nationally scare plant species and nationally important populations of invertebrates. Aquatic habitats are supporting habitats for birds and are therefore of value for the designated features of the Ramsar site, so will still be considered in the assessment at the locations crossed by the Natural Gas Connection Corridor, CO_2 Gathering Network, Water Abstraction and Discharge Corridors. Other notified features of the Ramsar site will be assessed in terms of value in Chapter 12: Terrestrial Ecology and Nature Conservation; and Chapter 15: Ornithology (PEI Report, Volume I).

13.4.16 Teesmouth and Cleveland Coast were extended in February 2020 to include areas of dunes and pools immediately north-east of the proposed PCC because overwintering birds use the pools for roosting, loafing and foraging; they are therefore essential to maintaining the integrity of the SPA / Ramsar and aquatic habitats.

13.4.17 Teesmouth and Cleveland Coast is designated as a Site of Special Scientific Interest (SSSI) for a variety of terrestrial, freshwater and ornithological features[1]. Aquatic habitats are supporting habitats for birds and are therefore of value for the designated features of the SSSI site, so will still be considered in the assessment at the locations crossed by the Natural Gas Connection Corridor, CO_2 Gathering Network, Water Abstraction and Discharge Corridors. Other notified features of the SSSI will be assessed in terms of value in Chapter 12: Terrestrial Ecology and Nature Conservation and Chapter 15: Ornithology (PEI Reports Volume I).

13.4.18 The following habitats are of value up to a national level, as defined in Appendix 13B: Aquatic Ecology Impact Assessment Methodology (PEI Report, Volume III) and will therefore be assessed as such in the impact assessment.

- Rivers,
- Ponds, lakes and reservoirs.

13.4.19 The habitats listed above are Habitats of Principal Importance in England as listed in Section 41 of the NERC Act 2006.

13.4.20 All other habitats within the potential ZoI of the Proposed Development will be assessed in the EcIA following field surveys in 2020.

Protected and Notable Species

Overview

13.4.21 The following protected or notable fauna and flora species have been identified as present, or potentially present, within the proposed Site boundary through desk study. Full results of targeted species and their relative nature conservation value will be included in the assessment after 2020 surveys and will be provided in Appendices 13D – 13F (PEI Report, Volume III).

- Fish;
- Aquatic macroinvertebrates; and
- Macrophytes.

13.4.22 It is important to note that the following baseline is based on limited data from the desk study information only. Protected species surveys are planned for February to April 2020 to gather robust aquatic data to inform the EcIA.

Fish

13.4.23 There are no statutory or non-statutory designated sites whose reason for designation is due or partially due to the presence of a fish species or assemblage within the vicinity of the Site.

[1] Note: South Gare and Coatham Sands SSSI is no longer considered a standalone Nature Conservation Designation and is now included within the Teesmouth and Cleveland Coast SSSI designation.

13.4.24 The large lagoon to the south of the former SSI Steelworks site has records of common carp, a non-native species that is not a relevant ecological feature. Given the stocked origin of these fish, they are of negligible value.

13.4.25 There is limited historical fish data within 200 m of the Site. The following protected or notable species could be present within the water bodies affected by the Proposed Development and are considered of up to National value: European eel, brown trout and lamprey species. Migratory and marine species such as Atlantic salmon are covered in Chapter 14: Marine Ecology and Nature Conservation (PEI Report, Volume I).

13.4.26 Fisheries surveys will be completed in Spring/Summer 2020 to gather robust data to further assess the presence of notable fish species within the area of the Site. Details of fish survey methods can be found in Appendices 13C: Aquatic Desk Based Assessment (PEI Report, Volume III).

Aquatic Macroinvertebrates

13.4.27 There are no statutory or non-statutory designated sites whose reason for designation is due to or partially due to the presence of aquatic macroinvertebrate species, or assemblage thereof, within the vicinity of the Site.

13.4.28 There are records (5 years old) of two notable species of aquatic beetles within the proposed Site boundary in Coatham Dunes ponds. These notable species are potentially of up to national value, pending field surveys, because they are designated as nationally scarce in the RDB and could be present within other reaches affected by the Proposed Development.

13.4.29 Overall, there is limited historical aquatic macroinvertebrate data within 200 m of the Site. Further surveys are proposed for Spring/Summer 2020 to gather robust data to further assess the presence of notable aquatic macroinvertebrate species within the area of the Site. Details of aquatic macroinvertebrate survey methods can be found in Appendices 13E: Aquatic Macroinvertebrate Assessment (PEI Report, Volume III) and will be available Summer 2020.

Macrophytes

13.4.30 Historical data has revealed no protected or notable macrophyte species recorded within 200 m of the Site; however, historical macrophyte data was limited and it is possible some notable species are present within the Site boundary – macrophyte surveys are recommended for Spring/Summer 2020 (the optimal season for macrophyte surveys is June to September).

13.4.31 During the desk-based study, Nuttall's waterweed *Elodea nuttalii*, an INNS listed in Schedule 9 of the WCA 1981, was identified at Steel House Pond, located within 200 m of the proposed Site boundary to be crossed by the Natural Gas Connection Corridor and the CO_2 Gathering Network. There is the potential for other INNS to be present and these will be identified during aquatic macroinvertebrate and macrophyte surveys.

Future Baseline

13.4.32 At this stage it is considered that there are no local strategies or proposed development that would affect the future aquatic baseline during construction, operation and decommissioning.

13.5 Development Design and Impact Avoidance

13.5.1 The design process for the Proposed Development has included consideration of ecological constraints and has incorporated, where possible, measures to reduce the potential for adverse ecological effects in accordance with the 'mitigation hierarchy' (Institute of Environmental Management and Assessment, 2013) and relevant planning policy. The measures identified and adopted include those that are inherent to the design of the Proposed Development, and those that can realistically be expected to be applied as part of construction environmental best practice, or as a result of legislative requirements.

13.5.2 The development design, impact avoidance and reduction measures that have been, or will be, adopted include:

- recognition that the design of the Proposed Development needs to deliver compliance with industry good practice and environmental protection legislation during both construction, operation and decommissioning, e.g. prevention of surface and ground water pollution from sediment being washed off site, fugitive dust management, noise prevention or amelioration;
- regards to the requirements of the relevant policy e.g. (EN-1) which states the following in regard to pollution:

  "*In considering an application for development consent, the IPC should 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. The IPC should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes, including those on land drainage, water abstraction and biodiversity, will be properly applied and enforced by the relevant regulator*."
- in support of the above, a commitment to prepare and agree a Framework Construction Environmental Management Plan (CEMP) detailing all requirements for environmental protection and legal compliance. The Framework CEMP will be secured through a requirement on the DCO;
- the proposed PCC will be constructed largely within existing areas of bare ground/ hard standing within the former SSI Steelworks, thus minimising requirements for land take from semi-natural habitats of potential ecological value;
- potential for disturbance of aquatic habitats and species associated with the Ponds at Coatham Dunes would been reduced through a commitment to use appropriate techniques to minimise water flow into

excavations for the proposed CO_2 Export Pipeline and the Discharge Corridor through the sand dunes and into the North Sea; and

- biosecurity measures will be put in place to reduce the spread of invasive non-native species during the construction phase.

13.6 Likely Impacts and Effects

13.6.1 This section describes the impacts and potential effects of the Proposed Development on relevant ecological features in the absence of any mitigation over and above that which is inherent to the design (as described in Section 13.5 above).

13.6.2 Relevant ecological features are those that are important and have the potential to be affected by the Proposed Development (CIEEM, 2018). An initial screening of potential impacts and effects is provided below to set the requirements for the more detailed impact assessment that will follow in the final ES. Those impacts that are considered unlikely to result in effects are scoped out and not considered further.

Construction

Impacts and Effects on Teesmouth and Cleveland Coast SPA

13.6.3 Teesmouth and Cleveland Coast SPA is of international value, of which freshwater habitats are a supporting ecological feature.

13.6.4 The likely impacts and effects of construction on freshwater habitat and species will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Teesmouth and Cleveland Coast Ramsar

13.6.5 Teesmouth and Cleveland Coast Ramsar site is of international value, of which freshwater habitats are a supporting ecological feature.

13.6.6 The likely impacts and effects of construction on freshwater habitat and species will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Teesmouth and Cleveland Coast SSSI

13.6.7 Teesmouth and Cleveland Coast SSSI are of national value, of which freshwater habitats are a supporting ecological feature.

13.6.8 The likely impacts and effects of construction on freshwater habitat and species will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Rivers

13.6.9 Rivers are up to National value but will be confirmed after surveys in Spring/Summer 2020.

13.6.10 Works associated with construction, specifically the connection corridors, may impact watercourses if cut and fill is used for crossings, resulting in temporary ground and habitat disturbance and construction could result in unavoidable release of sediments to the river causing subsequent temporary impacts to the channel.

13.6.11 The likely impacts and effects of construction on rivers will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Ditches

13.6.12 Ditches are up to national value but will be confirmed after surveys in Spring/Summer 2020.

13.6.13 Works associated with construction, specifically the connection corridors, may impact the ditches. Cut and fill is the approach resulting in temporary ground and habitat disturbance and construction could result in unavoidable release of sediments to the ditch causing subsequent temporary impacts to the channel.

13.6.14 The likely impacts and effects of construction on ditches will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Ponds

13.6.15 Ponds are up to national value but will be confirmed after surveys in Spring/Summer 2020.

13.6.16 Works associated with construction, specifically the Natural Gas Connection Corridor, the CO_2 Gathering Network and Abstraction and Discharge Corridors, may impact ponds within 200 m of the proposed Site boundary. Use of cut and fill techniques for crossings of is a worst-case approach resulting in temporary ground and habitat disturbance and construction could result in unavoidable release of sediments to the ponds causing subsequent temporary impacts to the to the ponds causing subsequent temporary impacts.

13.6.17 The likely impacts and effects of construction on ponds will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Fish

13.6.18 Fish are considered up to international value but will be confirmed after surveys in Spring/Summer 2020.

13.6.19 Works associated with the connection corridors may impact rivers and there may be associated disturbances to water body habitat. Habitat disturbance from construction could result in unavoidable release of sediments to water bodies and removal of habitat, reducing the overall quantity and quality of habitat for fish.

13.6.20 Main civil works for piling and excavating foundations in addition to use of trenchless technologies may result in noise and vibration next to waterbodies causing disturbance to fish.

13.6.21 The likely impacts and effects of construction on fish will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Macroinvertebrates

13.6.22 Macroinvertebrates are considered up to international value but this will be confirmed after surveys in Spring/Summer 2020.

13.6.23 Works associated with the connection corridors may impact rivers, ditches and ponds and there may be associated disturbances to water body habitat. Habitat disturbance from construction could result in unavoidable release of sediments to water bodies and removal of habitat, reducing the overall quantity and quality of habitat for aquatic macroinvertebrates, potentially changing community composition.

13.6.24 The likely impacts and effects of construction on macroinvertebrates will be assessed following field surveys in Spring/Summer 2020.

Impacts and Effects on Macrophytes

13.6.25 Macrophytes are considered up to international value but will be confirmed after surveys in Spring/Summer 2020.

13.6.26 Works associated with the connection corridors may potentially impact rivers, ditches and ponds and there may be associated disturbances to water body habitat. Habitat disturbance from construction could result in unavoidable release of sediments to water bodies and removal of habitat, reducing the overall quantity and quality of habitat for macrophytes, potentially changing community composition.

13.6.27 The likely impacts and effects of construction on macrophytes will be assessed following field surveys in Spring/Summer 2020.

Operation

13.6.28 Potential effects on aquatic habitats and species associated with the operation of the Proposed Development are anticipated to be not-significant as run-off from the development will be appropriately managed to minimise impacts on aquatic receptors. This will be assessed in the EcIA following surveys in Spring/Summer 2020.

Decommissioning

13.6.29 As outlined in Chapter 4: Proposed Development (PEI Report, Volume I) 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. This will include details of how surface water drainage should be managed on the PCC during decommissioning and demolition.

13.6.30 The DEMP will address all relevant ecological features present at the time of these works and will be prepared to ensure compliance with the legislation and planning policy relevant at that point in time.

13.6.31 Given that decommissioning activity is unlikely to take place within a timeframe that can be reasonably assessed by this EcIA, it will be inappropriate to comment on this phase in detail. The ecology of land within the proposed Site boundary has the potential to change in the time period

leading up to decommissioning, although this will be constrained to a large extent by the industrial context of the PCC.

13.6.32 Ecological effects of decommissioning are likely to be less significant than those during construction due to the presence of existing hardstanding and road networks which can be used as works areas. No adverse effects on the structure/ function and/ or conservation status of relevant ecological features is likely. Therefore, the potential effects would be negligible adverse and not significant.

13.7 Mitigation and Enhancement Measures

13.7.1 Appropriate enhancement and mitigation measures will be considered after the field surveys and completion of the EcIA.

13.8 Limitations or Difficulties

13.8.1 Assessment of likely significant effects in this PEI Report is based on desk based study only, with limited data.

13.8.2 Field surveys have not been undertaken to date and have therefore not informed the assessment of likely significant effects; however, field surveys to be undertaken in Spring/Summer 2020 will inform the EcIA.

13.9 Residual Effects or Conclusions

13.9.1 Residual effects will be assessed after completion of the field surveys, impact assessment and mitigation design in relation to aquatic receptors for the Proposed Development.

13.10 In-Combination Climate Change Impacts

13.10.1 In-Combination Climate Change Impacts (ICCI) will be assessed after the field surveys and completion of the EcIA.

13.11 References

CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Winchester: Chartered Institute of Ecology and Environmental Management.

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

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