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2.0 ASSESSMENT METHODOLOGY

2.1 Environmental Impact Assessment Approach and Scope

2.1.1 This Environmental Statement (ES) has been prepared to satisfy the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) ('the EIA Regulations') (see **Chapter 1**: Introduction of ES Volume I – **Application Document Ref. 6.2**).

2.1.2 In preparing this ES, (in line with the EIA Regulations as it forms part of the EIA process), reference has been made to the following guidance and advice:

- Planning Act 2008: Guidance on the pre-application process for major infrastructure projects (Ministry of Housing, Communities & Local Government, 2015);
- Advice Note Three: EIA Consultation and Notification (Planning Inspectorate (PINS), 2017a);
- Advice Note Seven: Environmental Impact Assessment, Preliminary Environmental Information, Screening and Scoping (PINS, 2020a);
- Advice Note Nine: Rochdale Envelope (PINS, 2018);
- Advice Note Ten: Habitats Regulations Assessment (PINS, 2017b);
- Advice Note Twelve: Transboundary Impacts (PINS, 2020b);
- Advice Note Seventeen: Cumulative Effects Assessment relevant to nationally significant infrastructure projects (PINS, 2019); and
- Advice Note Eighteen: The Water Framework Directive (PINS, 2017c).

2.1.3 The Scoping Opinion, received from the Secretary of State on 25 June 2020 (**Appendix 1B**: ES Volume II – **Application Document Ref. 6.3**) and the advice contained within it regarding assessment methodology, topics and presentation of the final ES, together with responses received through consultation and engagement have informed this ES.

2.1.4 In response to the Scoping Opinion, the EIA and this ES include assessments of the following environmental topics:

- **Chapter 8**: Air Quality;
- **Chapter 9**: Noise and Vibration;
- **Chapter 10**: Traffic and Transport;
- **Chapter 11**: Biodiversity and Nature Conservation;
- **Chapter 12**: Water Environment and Flood Risk;
- **Chapter 13**: Geology, Hydrogeology and Land Contamination;
- **Chapter 14**: Landscape and Visual Amenity;

- **Chapter 15**: Cultural Heritage;
- **Chapter 16**: Socio-economics;
- **Chapter 17**: Climate Change and Sustainability;
- **Chapter 18**: Major Accidents and Disasters; and
- **Chapter 19**: Cumulative and Combined Effects.

2.1.5 The EIA Scoping Report (**Appendix 1A** (ES Volume II – **Application Document Ref. 6.3**)) concluded that a number of topics did not need to be considered as part of the EIA accompanying the Application for the Proposed Development and could be scoped out. These topics and, where relevant, the response in the Scoping Opinion are described in this chapter.

Aviation

2.1.6 The Civil Aviation Association (CAA) has a general interest in charting all known structures of 91.4m (300 feet) or more above ground level (AGL) and may also require lighting at the top of tall structures.

2.1.7 The proposed/ existing chimney stacks of Keadby 2 and Keadby 1 Power Station are 75m and 60m respectively and therefore below the height that the CAA require to be charted although the proposed Keadby 2 Power Station stack will be fitted with lighting at the top for aviation warning purposes.

2.1.8 The nearest airfield (Sandtoft Airfield), is located approximately 4.6km to the south-west of the Proposed Development Site and has been formally consulted in respect of the Proposed Development.

2.1.9 Relevant details on the height of proposed structures and lighting is detailed within **Chapter 4**: The Proposed Development (ES Volume I – **Application Document Ref. 6.2**). Although there would be stacks for both the heat recovery steam generator (HRSG) for the CCGT and the CCP absorber unit, (and there could be up to two stacks for the smaller twin absorber unit option), only the single absorber stack could exceed 91.4m AGL (reaching up to 105m AGL (up to 107.6m AOD). The Applicant has consulted with the organisations listed in the Scoping Opinion as part of its formal consultation. Such organisations include: the CAA (the aviation regulator); NATS (responsible for managing civilian air traffic being routed through the en-route Controlled Airspace (CAS) above the UK) and the MOD Defence Infrastructure Organisation (DIO) (responsible for safeguarding the interests of the MoD).

2.1.10 The CAA was formally consulted on the Proposed Development to review any requirements for aviation lighting on the stack(s) and to enable the Proposed Development to be charted in future, if required. The CAA has confirmed that it has no specific comments to make on the Proposed Development itself but provided the Applicant with aviation related guidance that has been taken into account in the Requirements of the draft DCO (**Application Document Ref.**

2.1). The CAA also recommended that local airfields including Doncaster Sheffield Airport, Sandtoft Airfield and Humberside Airport should be consulted, which was carried out in March 2021. Doncaster Sheffield Airport confirmed that no impact on the airfield was anticipated and that they would only assess structures with a height of >150m AGL. The structures associated with the Proposed Development do not exceed this height.

2.1.11 The likely effect on military and civil aviation radar has been addressed through the above consultation. NATS has confirmed that it operates no infrastructure within 10km of the Proposed Development Site and accordingly do not anticipate an impact on operations. The DIO confirmed that the Proposed Development Site lies outside of MoD safeguarding areas and has no safeguarding objections.

2.1.12 In addition, the Meteorological Office is not a statutory consultee but has been consulted as part of the EIA process and has confirmed that the Proposed Development would not present a risk of compromising the use of Ingham Meteorological Radar, some 30km south-east of the Proposed Development Site.

Electronic Interference

2.1.13 The EIA Scoping Report noted that the proposed maximum building heights and expected temporary construction cranes would be of comparable height to those associated with Keadby 2 Power Station under construction. Therefore, an assessment of the Proposed Development's effect on electronic interference was not considered to be required.

2.1.14 The introduction of new structures of significant height and bulk into an environment can cause disruption to the reception of electromagnetic waves. Although this effect relates to both radio and TV signals, TV reception is potentially more affected and as such only TV reception has been considered.

2.1.15 The tallest structures associated with the existing Keadby 1 Power Station are the stacks at 60m high, whilst those associated with Keadby 2 Power Station under construction are the stack at 75m and HRSG building at 52m high. It is anticipated that the tallest structure associated with the Proposed Development would be the single CCP absorber stack at circa up to 105m AGL (107.6m AOD). With the exception of this stack, the Proposed Development would not introduce new buildings or structures that are significantly taller than those around it, including notably the adjacent turbines associated with Keadby Windfarm which are present to the north of the Proposed Development Site and which are 80m high to the nacelle or 126m high to the blade tip.

2.1.16 The proposed maximum building heights will be no higher than the existing stacks at Keadby 1 Power Station and those constructed for Keadby 2 Power Station, with the exception of the CCP absorber stack, which may be up to 105m AGL (107.6m AOD) but only up to 6.7m wide. The expected maximum

heights of temporary construction cranes will be similar to the height of those used for construction of Keadby 2 Power Station.

2.1.17 Terrestrial television signals are transmitted in digital format. The only relevant interference mechanism affecting digital terrestrial TV signals is attenuation due to buildings physically blocking (and absorbing) them. If the TV signals are too weak then the pictures very quickly deteriorate into random 'blocks' and then disappear altogether.

2.1.18 Given the height and massing of the buildings, stacks and temporary structures associated with the Proposed Development, the lack of nearby residential properties in close proximity to the Proposed Power and Carbon Capture (PCC) Site and the lack of any sight lines between transmission antenna and residential areas being obscured by the Proposed Development, it is considered that an assessment of the Proposed Development's effect on electronic interference is not required as part of the EIA.

2.1.19 Notwithstanding, as requested in the EIA Scoping Opinion (**Appendix 1B** (ES Volume II – **Application Document Ref. 6.3**)), further technical consideration has been given, since the publication of the EIA Scoping Report, to the potential for electronic interference. Ofcom guidance '*Tall structures and their impact on broadcast and other wireless services*' (Ofcom, 2009) states that '*Problems are more likely to occur if a building or structure is constructed which is significantly taller than those around it, or is on high ground'* and that the '*shadow*' (interference) caused by a tall structure between a transmitter and receiver disappears 1-5km away from the tall structure.

2.1.20 There are a number of telecommunications transmitters within 2km of the Proposed Development Site, as follows (www.mastdata.com):

- BT transmitter in Keadby, approximately 300m south-east of the Proposed Development Site;
- three transmitters adjacent to Althorpe Train Station, approximately 900m south-east of the Proposed Development Site;
- Vodafone transmitter in Althorpe, approximately 2km south of the Proposed Development Site; and
- O_2 transmitter approximately 2km east of the Proposed Development Site.

2.1.21 Relevant telecommunications companies have been formally consulted and responses to consultation are described in the Consultation Report (**Application Document Ref. 5.1**).

2.1.22 On the basis of the above, it is concluded that there is no potential for significant electronic interference effects as a result of the Proposed Development.

Population and Human Health

2.1.23 In the Scoping Opinion (**Appendix 1B** (ES Volume II – **Application Document Ref. 6.3**)), Public Health England (PHE) expressed a wish to see the summation of relevant issues into a specific section to provide a focus which ensures that public health is given adequate consideration. As such, **Appendix 16A:** Human Health (ES Volume II – **Application Document Ref. 6.3**) summarises key information, risk assessments, proposed mitigation measures, conclusions and residual impacts, relating to human health.

2.1.24 The Health and Safety Executive (HSE) confirmed in response to formal consultation that there are no licenced explosive sites within proximity to the Proposed Development Site, and confirmed the location of one major accident hazard pipeline (MAHP) within the Proposed Development Site:

- HSE ref 7034, operated by National Grid PLC; 7 Feeder Eastoft / Keadby Power Station.

2.1.25 Further advice was provided regarding relevant consents that may be required relating to the storage of hazardous substances at the Proposed Development Site. The information provided has been taken into account in the design of the Proposed Development and relevant consents likely to be required are identified in the Schedule of Other Consents and Licences (**Application Document Ref. 5.4**) which describes other consents and licences that are, or may be, required under other legislation for the Proposed Development.

2.1.26 Following receipt of the Scoping Opinion, a chapter is included in the ES to consider Major Accidents and Disasters (see **Chapter 18** (ES Volume I - **Application Document Ref. 6.2**)).

Waste Management

2.1.27 The EIA Scoping Report proposed that waste management should be scoped out of the EIA, but that in accordance with the EIA Regulations, the ES will provide an estimate, by type and quantity, of expected residues and emissions including quantities and types of waste produced during the construction and operation phases, where relevant. Relevant information has been provided including:

- proposals for materials management (**Chapter 4**: The Proposed Development (ES Volume I - **Application Document Ref. 6.2**);
- effects on traffic and transportation (and inter-related effects on noise and vibration and air quality) associated with material import/ export (**Chapter 10**: Traffic and Transport, **Chapter 8**: Air Quality and **Chapter 9**: Noise and Vibration (ES Volume I – **Application Document Ref. 6.2**); and
- compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery before disposal (presented in the Framework Construction

Environmental Management Plan (CEMP) – Annex A (Framework Site Waste Management Plan) (**Application Document Ref. 7.1**).

2.1.28 Information on types and quantities of waste anticipated and the management of these is provided in the Framework CEMP (**Application Document Ref. 7.1**) which will form the basis of the final CEMP to be secured by Requirement of the draft DCO (**Application Document Ref. 2.1**) to manage construction waste in accordance with the waste hierarchy.

2.2 Environmental Statement (ES)

2.2.1 This ES presents a description of the Proposed Development and its likely significant environmental effects on the environment during construction, operation (including maintenance where relevant) and decommissioning, based on the environmental information available at the time. It also details measures to avoid or reduce such effects and the alternatives considered.

2.2.2 This ES summarises the outcomes to date of the following EIA activities:

- establishing baseline conditions;
- consultation with statutory and non-statutory consultees;
- consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to the EIA;
- consideration of technical standards for the development of significance criteria and specialist assessment methodologies;
- design review;
- review of secondary information, previous environmental studies, publicly available information and databases;
- expert opinion;
- physical surveys and monitoring;
- desk-top studies;
- modelling and calculations; and
- reference to current guidance.

2.2.3 These activities have enabled the prediction of impacts in relation to the current and future baseline, and a prediction based on the information available of the likely significance of effects on environmental receptors.

2.2.4 The term ‘impact’ refers to changes arising from the Proposed Development, whereas the term ‘effect’ is used to describe the result of the impact on a receptor.

2.2.5 Each technical chapter within this ES (**Chapters 8 to 19** of ES Volume I – **Application Document Ref. 6.2**) follows the same structure for ease of reference, which is:

- introduction;
- legislation, planning policy and guidance;
- assessment methodology (including consultation and Rochdale Envelope approach);
- baseline conditions;
- development design and impact avoidance;
- likely impacts and effects;
- mitigation and enhancement measures;
- monitoring;
- limitations or difficulties;
- summary of likely significant residual effects; and
- references.

2.3 Rochdale Envelope

2.3.1 As discussed in **Chapter 4**: The Proposed Development (ES Volume I – **Application Document Ref. 6.2)** a number of technical parameters have yet to be finalised for the Proposed Development, in order to maintain flexibility prior to commencement of the detailed design of the Proposed Development . This is important as the technology for carbon capture on gas-fired power stations is at an early stage in design development, and also to maintain commercial flexibility to meet the changing demands of the UK market and government policy on the transition to Net Zero, prior to plant construction. Therefore, the Rochdale Envelope approach has been applied within the EIA to ensure a robust assessment is presented of the likely significant environmental effects of the Proposed Development, in accordance with the Planning Inspectorate's Advice Note 9: The Rochdale Envelope (PINS, 2018). This involves assessing the maximum (and where relevant, minimum) parameters for the elements where flexibility needs to be retained, recognising that the worst-case parameter for one technical assessment may differ from another. Where this approach is applied, this has been confirmed within the relevant chapters of this ES.

2.3.2 As is relevant for each technical discipline, alternative designs under the Rochdale Envelope approach have been assessed, in order to predict worst-case overall impacts. These have been used in the assessment of effects significance. Each of the **Chapters 6 – 19** of ES (Volume I – **Application Document Ref. 6.2**) describe the parameters applied in relation to the particular discipline. Where key elements of the Proposed Development design

have been fixed (e.g. maximum stack heights) these have been clearly described in **Chapter 4**: The Proposed Development (ES Volume I - **Application Document Ref. 6.2**). However, where it is necessary to retain flexibility in the Application, any future changes to design parameters will remain within the worst-case envelope assessed in this assessment. Justification for the need to retain flexibility in certain parameters is outlined in **Chapter 4**: The Proposed Development (ES Volume I - **Application Document Ref. 6.2**).

2.4 Study Areas: Spatial Scope of Assessment

2.4.1 The assessment chapters of this ES (**Chapters 6 to 19** of ES Volume I - **Application Document Ref. 6.2**) describe their spatial scope, including their rationale for determining the specific study area within which the assessment is focussed. The study areas are a function of the nature of the impacts and the locations of potentially affected environmental resources or receptors. The widest spatial scope considered is 15km (as set out in the EIA Scoping Report (**Appendix 1A** (ES Volume II - **Application Document Ref. 6.3**)), which relates to the appraisal of potential operational air quality effects on statutory designated ecological sites as a result of the Proposed Development. Justification for the spatial scope considered appropriate is documented in each topic chapter (**Chapters 6 to 19** of ES Volume I - **Application Document Ref. 6.2**).

2.4.2 The spatial scope of the Proposed Development is predominantly focussed on terrestrial areas where the permanent structures of the Proposed Development are to be developed. However, construction activities are also proposed within the marine, intertidal or subtidal areas of the River Trent and these have therefore also been considered in the assessments where appropriate. These locations are shown on **Figure 3.5** (ES Volume III (**Application Document Ref. 6.4**))**.**

2.5 Definition of Existing and Future Baseline

2.5.1 Existing baseline conditions have been defined for each technical assessment topic in **Chapters 8 – 19** (ES Volume I - **Application Document Ref. 6.2**), based on desk-based studies and site surveys, where necessary. As described above, it is also important to consider future baseline conditions (in the absence of the Proposed Development) against which the effects of the Proposed Development can be assessed.

2.6 Assessment Years and Assessment Scenarios: Temporal Scope of Assessment

2.6.1 The approach has been to assess the environmental impacts of the Proposed Development at key stages in its construction and operation and, as far as practicable, its final decommissioning.

2.6.2 The 'existing baseline' date is 2020/2021 since this is the period in which the baseline studies for the EIA have been undertaken. 'Future baseline' conditions are also predicted for each assessment scenario, whereby the conditions anticipated to prevail at a certain point in the future (assuming the Proposed Development does not progress) are identified for comparison with the predicted conditions with the Proposed Development. This can include the introduction of new receptors and resources into an area, or new development schemes that have the potential to change the baseline, where these form committed developments.

2.6.3 The assessment scenarios that have been considered for the purposes of the EIA (and considered in this ES) are as follows:

Base-case scenario

- existing baseline (2020/1);
- future baseline (No Development) (up to Q4 2022);
- future baseline (Keadby 2 Power Station) - Construction of Keadby 2 Power Station by the Applicant's Engineering, Procurement and Construction (EPC) contractor commenced in April 2019 and is ongoing; expected completion is by quarter 1 (Q1) 2022. As part of the future baseline for the Proposed Development, Keadby 2 Power Station structures will be present. As Keadby 2 Power Station becomes operational, emissions/ discharges from Keadby 2 Power Station will become part of the future baseline for the Proposed Development;
- construction. Construction of the Proposed Development could (subject to the necessary consents being granted and an investment decision being made) potentially start as early as Quarter 4 2022. However, for certain topics such as road traffic, a worst-case is to consider an assessment year later in the programme. Considering that the DCO may be granted allowing construction to commence within up to 7 years from the date of consent, construction activities may commence as late as 2029;
- opening and/ or operation – assuming an approximate three and a half year construction programme followed by a period of commissioning, the Proposed Development is unlikely to commence commercial operation before late 2026 with timescales for commercial operation linked to the development of the Humber Low Carbon Pipeline by National Grid Carbon (see below) into which the Proposed Development will connect. This is proposed to be secured via a Requirement of the draft DCO (**Application Document Ref. 2.1**). The assessment years have been chosen by specialists as the worst-case for each topic; and
- decommissioning - it is envisaged that the Proposed Development would have an operational life of circa 25 years. At the end of the expected design life, elements would be assessed for ongoing viability and, only if no longer viable, be decommissioned. It is therefore anticipated that, at the earliest,

decommissioning of the Proposed Development would be expected to commence at some point after 2051. This ES has assumed that the Proposed Development could operate for longer than a 25 year design life, and in relevant chapters has considered and assessed the potential for operational impacts/ effects to continue beyond this timeframe. If the operating life were to be extended, the Proposed Development would be upgraded in line with the legislative requirements at that time.

2.6.4 In most cases the assessment years for environmental topics are 'self-selecting', as they simply reflect the anticipated dates on or periods within which certain activities are predicted to take place.

Humber Low Carbon Pipeline and Northern Endurance Partnership Proposals

2.6.5 The Applicant will be responsible for constructing, operating, maintaining and decommissioning the plant and equipment required for the on-site capture of carbon dioxide emissions from the generating station. National Grid Carbon (NGC) will be responsible for the construction, operation and decommissioning of the carbon dioxide gathering network connecting onshore industrial facilities including the Proposed Development. It is expected that an export pipeline (the 'Humber Low Carbon Pipeline') will extend into the Keadby Power Station site to facilitate a connection from the Proposed Development. The gathering network and export pipeline do not form part of this Application and will be subject to a separate DCO application or applications by NGC.

2.6.6 The Applicant has had engagement with NGC in relation to routing. In addition, NGC has confirmed to PINS that routing and siting feasibility and relevant surveys are being progressed and it is anticipated that non-statutory consultation will be completed in Q3 2021, with EIA scoping planned for Q4 2021 after non-statutory consultation. The application is expected to be submitted to the Planning Inspectorate in Q3 2022. On this basis, determination of the DCO application(s) is therefore anticipated in 2024/ 2025 after which, construction could commence.

2.6.7 Permitting in relation to the Northern Endurance Partnership (NEP) carbon dioxide storage proposals is noted by National Grid Carbon to be being progressed in parallel, with ooffshore survey work planned in 2021 to support assessments and the permit application for the Endurance site. The ongoing work is considered by National Grid Carbon to be sufficiently advanced to provide confidence of a full chain scheme.

2.6.8 For the purposes of this ES, it is assumed that there will be an interface for construction activities between the Applicant's EPC Contractor and National Grid Carbon which are likely to overlap for a short period. The cumulative effects of construction activities have been considered in **Chapter 19**: Cumulative and Combined Effects (ES Volume I - **Application Document Ref. 6.2**) taking into account available information.

Keadby 1 Power Station

2.6.9 Keadby 1 Power Station is an existing gas fired power station that began commercial operation in 1996. It has a contract to provide capacity to the grid until September 2022 and will have opportunities to secure further agreements in future auctions. It is recognised that Keadby 1 Power Station will not run at the same time as the Proposed Development. This is because the capacity of the existing natural gas pipeline precludes a scenario in which the Proposed Development and Keadby 1 Power Station could operate concurrently.

2.6.10 Any future plans for Keadby 1 Power Station will be confirmed by the Applicant in due course and at that time, the public will be consulted as appropriate. In order to ensure relevant worst-case assessments in this ES, it is recognised that in the future baseline, decommissioning of Keadby 1 Power Station could take place and if that were the case, the process of decommissioning would follow the relevant regulations and consenting requirements at the necessary stage. Effects of decommissioning of Keadby 1 Power Station would be considered as part of any decommissioning consenting proposals at that time. Appropriate best practice mitigation measures, together with any required measures, would be applied during the decommissioning works. The decommissioning works would be subject to approval by the relevant authority.

2.6.11 In order to determine whether the removal of Keadby 1 Power Station structures would affect the worst-case assessment presented in this ES, this additional scenario ('scenario 2') has been considered in the assessment of landscape and visual amenity and built heritage aspects (**Chapter 14:** Landscape and Visual Amenity and **Chapter 15:** Cultural Heritage of ES Volume I - **Application Document Ref. 6.2**). For the purposes of this assessment, the following assumptions have been applied:

- structures – Keadby 1 Power Station structures would be likely to remain physically present in the landscape for a period of time once the operations at Keadby 1 Power Station had ceased and in the future, may need to be demolished, although it is not appropriate to rule out for example a repower of the site which would secure a future use for buildings. There is no statutory requirement for demolition and the timing of demolition is not subject to any specific conditions in the Keadby 1 Power Station Section 36 consent;
- operations - abstractions and emissions/ discharges from Keadby 1 Power Station would not occur concurrently with those of the operational Proposed Development. This is because the capacity of the existing natural gas pipeline precludes a scenario in which the Proposed Development and Keadby 1 Power Station could operate concurrently; and
- traffic movements associated with any future decommissioning of Keadby 1 Power Station would not overlap with those associated with the construction of the Proposed Development – although construction of the Proposed Development could potentially start as early as Q4 2022, given the seven

years expiration proposed for the draft DCO (**Application Document Ref. 2.1**), construction could start as late as 2029 with a peak of construction in 2031. Given that the future plans for Keadby 1 Power Station are within the Applicant's control, it is not envisaged that there would be a scenario whereby any decommissioning/ demolition of Keadby 1 Power Station would coincide with construction of the Proposed Development. This is particularly the case because Keadby 1 Power Station contains strategic infrastructure that Keadby 2 Power Station relies on and there would be a need to ensure that Keadby 2 Power Station operates efficiently with the Proposed Development infrastructure before any decision would be taken on Keadby 1 Power Station being decommissioned or demolished. The worst-case assessment presented in **Chapter 10**: Traffic and Transport (ES Volume I - **Application Document Ref. 6.2**) does not require a consideration of Keadby 1 Power Station demolition.

2.7 Development Design, Impact Avoidance and Mitigation

2.7.1 The design process for the Proposed Development has been heavily influenced by the findings of environmental appraisals and the EIA process. Therefore, the Proposed Development has been sited, and has had a number of measures incorporated into the concept design, to avoid or minimise environmental impacts. The key aspects where the design has evolved are described in **Chapter 4**: The Proposed Development (ES Volume I - **Application Document Ref. 6.2**). These include measures needed for legal compliance, as well as measures that implement the requirements of best practice guidance documents (e.g. Environment Agency guidelines on pollution prevention). The assessments have been undertaken on the basis of these measures being implemented (i.e. they are 'embedded mitigation').

2.7.2 The key aspects where the design has evolved are described in **Chapter 6**: Consideration of Alternatives (ES Volume I - **Application Document Ref. 6.2**).

2.7.3 Implementation of the impact avoidance and minimisation measures relied on in the assessment are set out in **Appendix 20A**: Schedule of Commitments (**Application Document Ref. 6.3**) and where relevant, these are proposed to be secured in the draft DCO (**Application Document Ref. 2.1**), for example through the setting of limits of deviation (e.g. specific maximum AOD heights and defined work areas) or specifying mitigation measures via a Requirement.

2.7.4 Once the likely effects were identified and quantified, consideration has been given to any further mitigation (over and above anything identified within the Development Design and Impact Avoidance sections of each topic chapter) that may be required to mitigate any significant adverse effects identified. The residual effects (after the implementation of mitigation) have then been assessed and presented in each topic chapter. Likely significant residual effects have been summarised in **Chapter 20**: Summary of Likely Significant Residual Effects (ES Volume I - **Application Document Ref. 6.2**).

2.8 Impact Assessment Methodology and Significance Criteria

2.8.1 Impacts are defined as changes arising from the Proposed Development, and consideration of the result of these impacts on environmental receptors enables the identification of associated effects, and their classification (major, moderate, minor and negligible, and adverse, neutral or beneficial). Each effect has been classified both before and after mitigation measures have been applied. Effects after mitigation are referred to as 'residual effects'.

2.8.2 The classification of effects is undertaken with due regard to the following:

- extent (local, regional or national) and magnitude of the impact;
- duration (whether short, medium or long-term);
- nature (whether direct or indirect, reversible or irreversible);
- whether the effects occur in isolation, are cumulative or interactive;
- performance against environmental quality standards and in the context of relevant legislation, standards and accepted criteria;
- number of receptors affected;
- sensitivity of receptors;
- compatibility with environmental policies; and
- professional experience and judgement of the assessor.

2.8.3 Further details are provided in each topic chapter of ES Volume I (**Application Document Ref. 6.2**).

2.8.4 Where it has not been possible to quantify effects, qualitative assessments have been undertaken, based on available knowledge and professional judgment. Where any uncertainty exists, this has been noted in the relevant technical chapter in the 'Limitations or Difficulties' section.

2.8.5 To enable comparison between technical topics and aid understanding of the EIA findings, standard terms are used wherever possible to classify effects throughout this ES (major, moderate, minor and negligible), and effects are also described as being adverse, neutral or beneficial. Where the quality standards for each technical discipline result in deviations in the standard assessment methodology, these are described in the relevant chapters, as applicable.

2.8.6 Definitions of the standard terms are provided below:

- negligible – imperceptible effect to an environmental resource or receptor;
- minor – slight, very short or highly localised effect;
- moderate – limited effect (by extent, duration or magnitude);

- major – considerable effect (by extent, duration or magnitude) of more than a local scale or in breach of recognised acceptability, legislation, policy or standards;
- adverse – detrimental or negative effects to an environmental resource or receptor;
- neutral – effects to an environmental resource or receptor that are neither advantageous or detrimental; and
- beneficial – advantageous or positive effect to an environmental resource or receptor.

2.8.7 Moderate and major effects are generally considered to be 'significant' for the purposes of the EIA Regulations, in accordance with standard EIA practice.

2.8.8 Each of the technical chapters provides further description and definition of the assessment criteria relevant to each topic. Where possible, this has been based upon quantitative and accepted criteria (for example British Standards), together with the use of value judgment and expert interpretation to classify effects.

2.8.9 In general, the classification of an effect is based on the magnitude of the impact and sensitivity or importance of the receptor, using the matrix shown in Table 2.1. Where there are deviations away from this matrix (due to the technical guidance for a specific assessment topic), this is highlighted within the relevant technical chapter and the reason for the variation explained.

Table 2.1: Classification of effects

Magnitude of Impact	Sensitivity/Importance of Receptor			
	High	**Medium**	**Low**	**Very Low**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

2.8.10 In the context of the Proposed Development, short-term effects are those associated with the site preparation and construction and/ or decommissioning phases, which cease when construction or decommissioning works are completed. Medium and long term effects are those associated with the completed, operational Proposed Development, which last for the duration of the operational phase and in some cases, beyond this. Effects may also be permanent (irreversible) or temporary (reversible) and direct or indirect.

2.8.11 Effects on areas on the scale of the Lincolnshire county, or North Lincolnshire district (or similar scale across local authority boundaries) are considered to be at a regional level, whilst effects that cover different parts of the country, or

England as a whole, are considered to be of a national level. Smaller scale effects are considered to be at a local level.

2.9 Cumulative and Combined Effects

2.9.1 As required by the EIA Regulations, consideration is given to the potential for cumulative and combined effects to arise as a result of the Proposed Development.

2.9.2 Cumulative effects are those that accrue over time and space from a number of development activities. The impact of the Proposed Development has been considered in conjunction with the potential impacts from other projects or activities which are reasonably foreseeable in terms of delivery. This includes projects that have been submitted but have not yet been approved or have planning permission or development consent that are located within a geographical scope where environmental impacts could act together to create a more significant overall effect on a receptor and where sufficient environmental information is available.

2.9.3 Combined effects are those resulting from a single development, in this case the 'Proposed Development,' on any one receptor that may collectively cause a greater effect (such as the combined effects of noise and air quality/dust impacts during construction on local residents).

2.9.4 The approach to assessment of cumulative and combined effects takes into account guidance contained within Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects' (PINS, 2019), which provides advice on the identification and assessment of other planned developments. **Chapter 19**: Cumulative and Combined Effects (ES Volume I - **Application Document Ref. 6.2**) presents the findings.

2.10 Inter-related Effects and Interdependencies

2.10.1 It is recognised that different consultees have interests in different aspects of the environment. For ease of reference, Table 2.2 illustrates where inter-related effects arise.

Table 2.2: Inter-relationships between environmental topics in this ES

	Chapter 8: Air Quality		Chapter 9: Noise and Vibration	Chapter 10: Traffic and Transport	Chapter 11: Biodiversity and Nature	Chapter 12: Water Environment and Flood Risk	Chapter 13: Geology, Hydrogeology and	Chapter 14: Landscape and Visual Amenity	Chapter 15: Cultural Heritage	Chapter 16: Socio economics	Chapter 17: Climate Change and Sustainability	Chapter 18: Major Accidents and Disasters
Chapter 8: Air Quality				■	■		■	■	■		■	■
Chapter 9: Noise and Vibration				■	■	■			■			
Chapter 10: Traffic and Transport	■	■	■			■		■		■	■	■
Chapter 11: Biodiversity and Nature Conservation	■	■	■			■	■	■			■	

	Chapter 8: Air Quality		Chapter 9: Noise and Vibration	Chapter 10: Traffic and Transport	Chapter 11: Biodiversity and Nature	Chapter 12: Water Environment and Flood Risk	Chapter 13: Geology, Hydrogeology and	Chapter 14: Landscape and Visual Amenity	Chapter 15: Cultural Heritage	Chapter 16: Socio economics	Chapter 17: Climate Change and Sustainability	Chapter 18: Major Accidents and Disasters
Chapter 12: Water Environment and Flood Risk												
Chapter 13: Geology, Hydrogeology and Land Contamination												
Chapter 14: Landscape and Visual Amenity												

	Chapter 8: Air Quality		Chapter 9: Noise and Vibration	Chapter 10: Traffic and Transport	Chapter 11: Biodiversity and Nature	Chapter 12: Water Environment and Flood Risk	Chapter 13: Geology, Hydrogeology and	Chapter 14: Landscape and Visual Amenity	Chapter 15: Cultural Heritage	Chapter 16: Socio economics	Chapter 17: Climate Change and Sustainability	Chapter 18: Major Accidents and Disasters
Chapter 15: Cultural Heritage												
Chapter 16: Socio economics												
Chapter 17: Climate Change and Sustainability												
Chapter 18: Major Accidents												

	Chapter 8: Air Quality		Chapter 9: Noise and Vibration	Chapter 10: Traffic and Transport	Chapter 11: Biodiversity and Nature	Chapter 12: Water Environment and Flood Risk	Chapter 13: Geology, Hydrogeology and	Chapter 14: Landscape and Visual Amenity	Chapter 15: Cultural Heritage	Chapter 16: Socio economics	Chapter 17: Climate Change and Sustainability	Chapter 18: Major Accidents and Disasters
and Disasters												

2.11 Transboundary Effects

2.11.1 The Secretary of State undertook an initial transboundary screening exercise for the Proposed Development under Regulation 32 of the EIA Regulations. The screening exercise concluded, on the basis of the information available from the Applicant at scoping stage, that the Proposed Development is not likely to have a significant effect either alone or cumulatively on the environment in any European Economic Area (EEA) state. A copy of the matrix is provided (**Appendix 2A** (ES Volume II – **Application Document Ref. 6.3**)).

2.11.2 Consideration has been given to the Planning Inspectorate Advice Note 12: Transboundary Impacts (PINS, 2020) and specifically Annexes 1 and 2, which set out the criteria and relevant considerations taken into account by the Planning Inspectorate when screening NSIP for likely significant effects on the environment in another EEA state.

2.11.3 The nearest EEA states are the Republic of Ireland at over 350km west and the Netherlands at over 370km east of the Proposed Development Site. Taking into account the potential pollution impact pathways through air, land and water, and the effects predicted to arise from the Proposed Development, set out in **Chapter 8**: Air Quality, **Chapter 11**: Biodiversity and Nature Conservation and **Chapter 12**: Water Environment and Flood Risk (ES Volume I - **Application Document Ref. 6.2**) within their respective spatial scopes, the likelihood of significant effects on the environment of another EEA state is considered negligible. Therefore, significant transboundary effects associated with the Proposed Development are not anticipated. The MMO, in their response to formal consultation, also recognise that transboundary effects associated with the Project are not anticipated.

2.12 References

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Ofcom (2009) *Tall structures and their impact on broadcast and other wireless services*. Available online: https://www.ofcom.org.uk/__data/assets/pdf_file/0026/63494/tall_structures.pdf.

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Planning Inspectorate (2020a) *Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping, Version 7, June 2020*. Available online:

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Planning Inspectorate (2019) *Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects, Version 2, August 2019*. Available online: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/.