

# The Keadby 3 Low Carbon Gas Power Station Project

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The Keadby 3 Low-Carbon Gas Power Station Order

Land at and in the vicinity of the Keadby Power Station site,  
Trentside, Keadby, North Lincolnshire

**Environmental Impact Assessment Scoping Report**

The Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations  
2017 Regulations – Regulation 10 (Application for a Scoping Opinion)

Applicant: SSE Generation Limited  
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## GLOSSARY

<b>Abbreviation</b>	<b>Description</b>
AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling System
AEP	Annual Exceedance Probability
AGI	Above Ground Installation
AOD	Above Ordnance Datum
ANNWLMB	North Nottinghamshire Water Level Management Board
APFP	Applications: Prescribed Forms and Procedure (Regulations, 2009)
APIS	Air Pollution Information System
AQMA	Air Quality Management Area
AQS	Air Quality Objectives
BAT	Best Available Techniques
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Survey
BS	British Standard
CCC	Committee on Climate Change
CCP	Carbon Capture Plant
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Ready
CCUS	Carbon Capture, Utilisation and Storage
CDM	Construction Design and Management Regulations 2015
CEMP	Construction Environmental Management Plan
Cifa	Chartered Institute for Archaeologists
CO	Carbon Monoxide
COMAH	Control of Major Accident Hazards
COPA	Control of Pollution Act 1974
CO <sub>2</sub>	Carbon Dioxide
CRT	Canal and River Trust
CRTN	Calculation of Road Traffic Noise
DCO	Development Consent Order
DEMP	Decommissioning Environmental Management Plan
DMRB	Design Manual for Roads and Bridges
DTM	Digital Terrain Model
EA	Environment Agency
EIA	Environmental Impact Assessment
ELV	Emission Limit Value

Abbreviation	Description
ERA	Environmental Risk Assessment
ES	Environmental Statement
FRA	Flood Risk Assessment
GEART	Guidelines for Environmental Assessment of Road Traffic
GHG	Greenhouse Gases
GW	Gigawatts
HCA	Homes and Communities Agency
HE	Historic England
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HLC	Humber Low Carbon Cluster
HRSG	Heat Recovery Steam Generator
HRA	Habitats Regulations Assessment
HSE	Health and Safety Executive
IAQM	Institute of Air Quality Management
ICCI	In-Combination Climate Change Impact
IEMA	Institute of Environmental Management and Assessment
IED	Industrial Emissions Directive
ISO	International Organisation for Standardisation
kV	Kilovolt
LCRA	Land Contamination Risk Management
LCA	Landscape Character Area
LWS	Local Wildlife Site
OMH	Open Mosaic Habitats
MAGIC	Multi-agency geographical information for the countryside
MAPP	Major Accident Prevention Policy
MMO	Marine Management Organisation
MW	Megawatt
NCA	National Character Area
NERC	Natural Environment and Rural Communities
NIA	Nature Improvement Area
NIC	National Infrastructure Commission
NHBC	National House Building Council
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
PAH	Polyaromatic Hydrocarbons
PEA	Preliminary Ecological Appraisal
PEI	Preliminary Environmental Information
PFA	Pulverised Fuel Ash
PINS	Planning Inspectorate
PRoW	Public Right of Way
PWS	Private Water Supply
SAC	Special Area of Conservation
SCR	Selective Catalytic Reduction

Abbreviation	Description
SFRA	Strategic Flood Risk Assessment
SoCC	Statement of Community Consultation
SPA	Special Protection Area
SPZ	Source Protection Zone
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
TA	Transport Assessment
TCPA	Town and Country Planning Application
TWh	Terawatt hours
RBMP	River Basin Management Plan
WFD	Water Framework Directive
WHO	World Health Organisation
ZTV	Zone of Theoretical Visibility

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## 1.0 INTRODUCTION

### Background

- 1.1 AECOM Ltd ('AECOM') has been commissioned by SSE Generation Ltd. (hereafter referred to as 'the Applicant') to prepare an Environmental Impact Assessment (EIA) Scoping Report to inform the scope and content of an EIA for a proposed Low Carbon Combined Cycle Gas Turbine (CCGT) Generating Station on land at, and in the vicinity of, the existing Keadby Power Station, Trentside, Keadby, Scunthorpe DN17 3EF (hereafter referred to as the 'Proposed Development Site') (see **Figure 1** in **Appendix A**).
- 1.2 The low carbon CCGT generating station will require natural gas, electricity and cooling water connections, and will also be designed to operate either as a hydrogen fired plant or with post-combustion carbon capture and compression plant installed such that the plant can be operated as a dispatchable low carbon generating station (referred to herein as 'the Proposed Development').
- 1.3 At this stage in the development of the Project, the final technology selection cannot yet be made, as it will be determined by various technical and economic considerations and will be influenced by future UK Government policy. The design of the Proposed Development, therefore, incorporates a necessary degree of flexibility in the choice of low carbon technology, to allow for the future selection of the preferred technology in the light of prevailing policy and market conditions once a DCO is granted.
- 1.4 The Applicant is progressing concept design options for two alternative low-carbon technology pathways:
  - hydrogen-firing of the generating station, with hydrogen generation and associated carbon capture carried out off-site by others; and
  - firing of natural gas supplied by National Grid Gas with post-combustion capture of the carbon dioxide (CO<sub>2</sub>) emitted from the process. In this case, the CO<sub>2</sub> would be sent into the Humber Low Carbon (HLC) Cluster for Keadby for end usage and sequestration.
- 1.5 The Proposed Development is to be developed with the necessary infrastructure to enable it to be fired by hydrogen gas, as opposed to natural gas, which may include a low carbon fuel gas blend (natural gas stream enriched with hydrogen) as the hydrogen economy develops regionally. However, in the event that CCS is deployed, the Proposed Development has also been sited to be able to connect into the emerging proposals for the HLC Cluster CO<sub>2</sub> pipeline being developed to connect carbon emitters in the region and transport the captured carbon to an off-site geological store. A Carbon Capture Readiness (CCR) assessment will be prepared and submitted with the Application (refer to paragraphs 6.212 – 6.214).
- 1.6 The indicative site under consideration for the Proposed Development is shown in **Figure 2A** (**Appendix A**).



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- 1.7 The Proposed Development is subject to ongoing technical studies, but the low-carbon CCGT generating station is expected to comprise a single CCGT unit achieving an electrical output capacity of up to 910 megawatts (MW) onto the national transmission network.
  - 1.8 The low-carbon CCGT generating station, together with the associated infrastructure which will form part of the Proposed Development is to be located on land ('the Main Site') within the existing Keadby Power Station site that is under the control of the Applicant. The proposed electricity transmission, cooling water and gas supply infrastructure are all predominantly located on land under the control of the Applicant, although they may cross other third-party land.
  - 1.9 Figures identifying the locations of each element of the Proposed Development are provided in Appendix A. The Main Site is shown in **Figure 2B (Appendix A)**.
  - 1.10 This EIA Scoping Report considers the environmental context of the Proposed Development Site and the potential environmental impacts of the Proposed Development. Where impacts are considered to have the potential to cause significant environmental effects, these are identified and the proposed approach to be used to characterise the impacts and understand the significance of their effects is outlined. This report also outlines issues perceived to be non-significant, which it is proposed do not require formal assessment as part of the EIA.
  - 1.11 The EIA is an iterative process that feeds into the engineering design process to mitigate significant environmental effects where they are predicted to occur. The final design iteration, along with the findings of the EIA will be reported in an Environmental Statement (ES), in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('EIA Regulations') and will be submitted with the Development Consent Order (DCO) Application in accordance with Regulation 5 (2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ('APFP Regulations').

### Strategic Context

- 1.12 The Committee on Climate Change (CCC) has a stated need to invest in and deploy carbon capture and negative emissions technology at scale in order to reach UK's target of net zero by 2050 (The Committee on Climate Change, 2019). The CCC Net Zero report also identified that at least one of the UK's CCUS emerging regional clusters should involve substantial production of low-carbon hydrogen by 2030 to stay 'on track' for net zero. Aligned with this objective, the HLC Cluster – a consortium of 11 energy and industrial companies (including the Applicant) - has agreed to work together to develop a joint plan to decarbonise industrial emissions and transform the Humber region into the world's first net zero carbon industrial cluster by 2040. The HLC Cluster is therefore exploring strategic opportunities to develop a hydrogen economy in the Humber region as well as opportunities to capture CO<sub>2</sub> at scale from industry around the Humber Estuary, using pipelines that transport CO<sub>2</sub> emissions to permanent offshore storage in naturally occurring aquifers under the southern North Sea.

- 1.13 Various routing options are available to connect the Proposed Development Site into the necessary hydrogen supply or CO<sub>2</sub> export infrastructure. Discussions with HLC Cluster partners are ongoing in respect of the required pipeline connections and parties are working closely to identify options for CO<sub>2</sub> and hydrogen pipeline routes, taking into consideration technical and environmental opportunities and constraints. The development of hydrogen or CO<sub>2</sub> pipelines will be progressed under separate consents and is not included in the indicative DCO order limits for the Proposed Development Site; at this stage the plan is for the pipelines to be developed to connect into the Keadby site.

### **The Applicant**

- 1.14 The Applicant is part of the FTSE-listed SSE plc, one of the UK's largest and broadest-based energy companies, and the country's leading generator of renewable energy. Over the last 20 years, the SSE Group has invested over £20bn to deliver industry-leading offshore wind, onshore wind, CCGT, energy from-waste, biomass, energy networks and gas storage projects. The Applicant owns and operates the adjacent Keadby 1 Power Station and is in the process of constructing Keadby 2 Power Station. SSE Renewables also operates the Keadby Windfarm which lies to the north of the Proposed Development and generates renewable energy from 34 turbines, with a total installed generation capacity of 68MW.

### **Consenting Regime**

- 1.15 The Proposed Development falls within the definition of a 'nationally significant infrastructure project' (NSIP) under Section 14(1)(a) and 15(2) of the Planning Act 2008 (hereafter referred to as 'the 2008 Act') as a 'generating station exceeding 50 MW'. It is also a 'Schedule 1' development under the EIA Regulations as it constitutes "Thermal power stations and other combustion installations with a heat output of 300 megawatts or more". As such, an EIA is required for the Proposed Development and an ES must be prepared in accordance with these Regulations to accompany the Application.
- 1.16 As a NSIP project, the Applicant is required to seek a Development Consent Order (DCO) to construct and operate the generating station, under Section 31 of the 2008 Act. Section 37 of the 2008 Act also governs the form, content and accompanying documents that are required as part of a DCO application. The requirements are implemented through the APFP Regulations which state that an application must be accompanied by an ES, where a development is considered to be 'EIA development' under the EIA Regulations.
- 1.17 The Application will be submitted to the Planning Inspectorate who will examine the application and make recommendations to the Secretary of State for Business, Energy and Industrial Strategy (BEIS) pursuant to the 2008 Act, who will subsequently determine whether or not a DCO should be granted for the Proposed Development.
- 1.18 Regulation 3(1) of the EIA Regulations defines the meaning of 'EIA development' (with reference to Schedules 1 and 2 to the EIA Regulations). Schedule 1 to the EIA Regulations, which describes developments for which an EIA is necessary, includes "thermal power stations, and other combustion installations, with a heat output of 300 megawatts or

more.” EIA is compulsory for Schedule 1 developments given the type and/or the scale of the development is likely to have the potential for significant effects on the environment.

- 1.19 Given its capacity and the nature of the proposed activities, the Proposed Development will therefore be ‘EIA development’ and consequently a formal EIA screening opinion is not being sought from the Secretary of State.
- 1.20 As the Applicant proposes to provide an ES with the Application for a DCO, this report constitutes the Applicant's notification under Regulation 8 (1b) of the EIA Regulations.
- 1.21 Having determined that an ES will be included as part of the application for development consent, which will present the details of the EIA of the Proposed Development, in accordance with Regulation 10(1) of the EIA Regulations the Applicant is applying to the Secretary of State for their opinion as to the scope and level of detail of the information to be provided in the ES.
- 1.22 **Figure 2A (Appendix A)** illustrates the indicative Application boundary for the Site, which comprises the proposed generating station and associated infrastructure including hydrogen and gas infrastructure connections, carbon capture plant, water, electricity, as well as an indicative laydown area for construction and an area for biodiversity management.
- 1.23 A description of the existing land-use within and in proximity to the Site and an overview of the Proposed Development is presented in Sections 2 and 3 of this report.

### Objectives of Scoping

- 1.24 The scoping phase of the EIA process provides a framework for identifying potential environmental impacts arising from the Proposed Development, establishing the likely significant environmental effects and distinguishing the priority issues to be addressed within the ES. Scoping also allows stakeholders an early opportunity to comment on the proposed structure, methodology and content of the ES.
- 1.25 This Scoping Report has been prepared in accordance with the relevant legislative provisions and associated Advice Notes (published by Planning Inspectorate).
- 1.26 Table 1 presents a list of information that should be included in a request for a scoping opinion, as prescribed by Regulation 10(3) of the EIA Regulations. Table 2 presents the information highlighted in paragraph 4.2 (and associated Insert 2) of Advice Note 7 ‘Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements’ (Planning Inspectorate, 2017) regarding the content of a Scoping Report, including signposting to the location in this report where the information is presented.

**Table 1 – Information Required for a Request for a Scoping Opinion**

Description of Information Required (Regulation 10(3))	Supplementary Descriptions (Regulation 8(3))	Section in Scoping Report where presented
A plan sufficient to identify the land	-	<b>Figure 1 and Figure 2A (Appendix A)</b>
A description of the proposed development, including its location and technical capacity	A description of the physical characteristics of the whole development; and a description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected.	Section 3 Section 2 and Section 6
An explanation of the likely significant effects of the development on the environment	...resulting from: the expected residues and emissions and the production of waste, where relevant; and the use of natural resources, in particular soil, land, water and biodiversity.	Section 6 Section 3
Such other information or representations as the person making the request may wish to provide or make		

**Table 2 – Information provided in the Scoping Report (based on Advice Note 7)**

Description of Information Required	Section in Scoping Report where the Information is Presented
<p><b>The Proposed Development</b></p> <ul style="list-style-type: none"> <li>an explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters;</li> <li>referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development.</li> </ul>	<p>Section 3</p> <p><b>Figures 1, Figure 2A and Figure 2B (Appendix A)</b></p>
<p><b>EIA Approach and Topic Areas</b></p> <ul style="list-style-type: none"> <li>an outline of the reasonable alternatives considered and the reasons for selecting preferred option;</li> <li>a summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues;</li> <li>a detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided;</li> <li>results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters;</li> <li>aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g. criteria for determining sensitivity and magnitude;</li> <li>any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.</li> </ul>	<p>Section 4 (Project Alternatives)</p> <p>Section 7 (Non-Significant Issues)</p> <p>Section 7 (Matters to be scoped out)</p> <p>Section 2 (Description of the Existing Environment)</p> <p>Section 6 (Baseline Conditions and Scope of the Assessment for each environmental topic) and Section 8 (EIA Process)</p>

Description of Information Required	Section in Scoping Report where the Information is Presented
	Section 6 (Scope of the Assessment for each environmental topic)
<b>Information sources</b> <ul style="list-style-type: none"> <li>references to any guidance and best practice to be relied upon;</li> <li>evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities);</li> <li>an outline of the structure of the proposed ES.</li> </ul>	Section 6 (Scope of the Assessment for each environmental topic)  N/A  Section 8 (EIA Process)

Source: Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information and Environmental Statements, December 2017

### Structure of Remainder of this Report

1.27 The remainder of this report is structured as follows:

- Section 2 – Description of the Existing Environment: provides a description of the site and the surrounding area, together with any potentially significant environmental sensitivities/receptors within the vicinity of the Proposed Development Site;
- Section 3 – The Proposed Development: outlines the key elements (including those likely to have a significant environmental effect) of the Proposed Development, the infrastructure to be developed and the function of the operational plant;
- Section 4 – Consideration of Alternatives: details the alternatives that have been considered during development of the Proposed Development design;
- Section 5 – Planning Policy and Need: identifies the key documents relating to national and local planning policy in the area, together with a summary of some of the principal planning policies or provisions as relevant to the need for Proposed Development;
- Section 6 – Potentially Significant Environmental Effects: provides a discussion of how the Proposed Development may interact with the different aspects of the receiving environment, together with a description of the proposed assessment methodologies, guidance and best practice to be adopted for the EIA of the Proposed Development (or, as appropriate, its design);
- Section 7 – Matters to be Scoped Out: provides a summary of the issues proposed to be scoped out of the EIA and reasoning why, including a summary in Table 10;
- Section 8 - Environmental Impact Assessment Process: provides an overview of the approach to be taken in the EIA and outline structure for the proposed ES;
- Section 9 –Summary;
- Section 10 – References;
- Appendix A – Figures, referenced within this report:
  - **Figure 1:** Site Location Plan;

- **Figure 2A:** Indicative DCO Site;
- **Figure 2B:** Indicative DCO Site Layout;
- **Figure 3A:** Statutory and Non-Statutory Designated Ecological Sites;
- **Figure 3B:** Designated Heritage Assets within 1km, 3km and 5km of the Proposed Development Site;
- **Figure 3C:** Water Receptors within 5km of the Proposed Development Site;
- **Figure 3D:** Other Constraints within 5km of the Proposed Development Site; and
- **Figure 3E:** Other Developments to be Considered in Cumulative Impact Assessment.

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## 2.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

### Proposed Development Site

- 2.1 The Main Site will be located within the wider Keadby Power Station site, approximately 5km to the west of the town of Scunthorpe adjacent to the village of Keadby. The Main Site, together with the connection corridors for the electrical grid connection, gas connection, water abstraction and discharge, will be located within the administrative boundary of North Lincolnshire Council (a unitary authority). **Figure 2A (Appendix A)** illustrates the current extent of land considered for the Proposed Development.
- 2.2 For the purposes of this report, the Proposed Development Site consists of a number of areas corresponding with the different parts of the Proposed Development. These are summarised below and illustrated on **Figure 2B (Appendix A)**:
- Main Site. This approximately rectangular area would encompass the proposed generating station comprising the CCGT including turbines, boilers, exhaust gas treatment, stack(s) and ancillary plant as well as cooling infrastructure, electricity export infrastructure and the equipment needed for the Proposed Development to be able to burn hydrogen as the primary fuel or for a post combustion CO<sub>2</sub> capture plant to be installed, to allow for whichever option is selected;
  - Water Connection Corridors. This area comprises a corridor following the routes of the intake (south) and outfall (north) pipework currently associated with the cooling operations for the Keadby 1 Power Station; and which are proposed to also be utilised for Keadby 2 Power Station. Furthermore, additional land associated with the cooling water intake from the Stainforth and Keadby Canal is included to facilitate the option to use this infrastructure for the Proposed Development;
  - Electrical connection area to National Grid 400 kilovolt (kV) substation;
  - Waterborne transport off-loading area that would be available should waterborne transport of components via the River Trent be considered as an option by contractors to deliver abnormal indivisible loads (AIL). A crane is currently positioned on the land adjacent to the wharf to transfer components into the Keadby Power Station site;
  - Indicative laydown area that will be restored for use as landscaping and biodiversity management; and
  - Land associated with Keadby 2 Power Station and Keadby 1 Power Station is also included for the purposes of facilitating connections to the Proposed Development for gas, electricity, water and other necessary infrastructure.
- 2.3 The Proposed Development Site encompasses an area of approximately 70.1 hectares (ha) and is indicative at this stage. The land required for the Proposed Development will be subject to appraisal and refinement as the preparation of the Application progresses. The final layout that will be incorporated within the proposed DCO order limits will be

determined through ongoing studies of potential constraints and discussions with relevant stakeholders.

### History of the Proposed Development Site and surrounding areas

- 2.4 The Proposed Development Site forms part of the landholding of Keadby Power Station. The Keadby Power Station site has a long history of power generation, commencing with a former coal fired power station which was operational between 1952 and 1984, which was demolished by the early 1990's. The current power station, referred to as Keadby 1 Power Station, is a 755MW CCGT power station and has been operating since 1996. Keadby 1 Power Station includes two gas turbines, with associated boilers and exhaust stack, a steam turbine ancillary plant and equipment and general office buildings.
- 2.5 Following the grant of a variation to an existing Section 36 consent in 2016, construction of an 910MW CCGT power station (Keadby 2) commenced in April 2019 on land adjacent to Keadby 1. The construction of Keadby 2 is ongoing and is expected to be complete by quarter 1 (Q1), 2022. Part of the land proposed for the Keadby 2 carbon capture plant is currently being used for construction laydown for Keadby 2 Power Station. For the purposes of connections, the Proposed Development Site boundary includes land associated with both Keadby 1 and Keadby 2 Power Station.
- 2.6 A number of historical landfills are located within the immediate vicinity of the Main Site, including a landfill which was licenced from 2000. This is illustrated on **Figure 3D (Appendix A)**. The area proposed for construction laydown and biodiversity management is currently unused and vegetated, with mounds or spoil heaps which may contain Pulverised Fuel Ash (PFA) associated with historic coal-fired power use. Over time, some semi-natural habitat has become established on this disturbed ground.

### Local Topography and Surrounding Land-Use

- 2.7 Land within and surrounding the Proposed Development Site is generally low lying at elevations below 10m Above Ordnance Datum (mAOD) and with very shallow gradients. Beyond the current Keadby Power Station area, land use is almost entirely arable farming, however, the immediate site surroundings have been developed in recent years with power infrastructure, including the Keadby Windfarm to the north which became operational in 2014. Additional wind turbines and electricity transmission and distribution infrastructure is present over the wider area.

### Environmental Receptors

- 2.8 A number of environmental receptors have been identified within and in the vicinity of the Proposed Development Site. Each of these are detailed below under each environmental discipline (note this is not intended to be an exhaustive list at this stage and will be developed as the EIA progresses and the Preliminary Environmental Information (PEI) Report is produced). All distances are approximate and given as the shortest distance between the receptor and the closest point of the Proposed Development Site Boundary (see **Figure 3D – Appendix A**).



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### Residential

- 2.9 The nearest settlement is the village of Keadby which is located immediately adjacent to the Water Connection Corridor area and approximately 300m from the Main Site at its closest point.
- 2.10 Other settlements nearby include: Crowle (3.6km) and Ealand (2.2km) to the west; Althorpe (1.7km) to the south-east and Gunness (580m) to the east on the eastern bank of the River Trent. Closer to the Main Site are a small number of individual dwellings and further settlements and individual residential receptors are located in the surrounding rural areas. Those closest properties to the Proposed Development include a property on Chapel Lane (buildings within <10m from the Water Connection Corridor) and on the B1392, (residential properties also located within 10m of the Water Connection Corridor). An isolated property is present at Vazon Bridge, approximately 20m to the south of the Main Site, adjacent to the Stainforth and Keadby Canal. Other isolated properties include Pilfrey Farm located approximately 200m east of the option for construction access from the A18, a further property located approximately 430m west of the indicative laydown and biodiversity management area to the west of the Proposed Development Site, and a further isolated property located approximately 720m north-east of the Proposed Development Site. **Figure 3D – Appendix A** illustrates the location of surrounding residential receptors and communities.

### Traffic and Transport

- 2.11 Access to the Proposed Development Site during the construction phase for HGV construction traffic could be via the existing access road from the A18 that was constructed in line with the transport conditions imposed for the consented development for Keadby 2, requiring heavy commercial traffic not to be routed through Keadby village. The location of this access is included within the Proposed Development Site boundary on **Figure 2A (Appendix A)**.
- 2.12 Keadby Power Station site is accessed from the B1392, a single-carriageway road that serves the village of Keadby. The B1392 joins the A18 trunk road approximately 1.2km south of the Waterborne Transport Off-loading Area at a junction to the west of the village of Althorpe.
- 2.13 Chapel Lane runs north-south through the Main Site and is an adopted highway maintained by North Lincolnshire Council to a location north of its crossing of the North Soak Drain and Stainforth and Keadby Canal.
- 2.14 Other roads within the Proposed Development Site include Ealand Road/Bonnyhale Road which runs east-west along the southern edge of Main Site.
- 2.15 Trent Road, North Road and West Road are all roads facilitating the movement of traffic within the current Keadby 1 Power Station site and the Keadby 2 Power Station construction site within the Proposed Development Site boundary.

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- 2.16 Ealand/Bonnyhale road and Trent, North and West roads are all private roads under the control of the Applicant.
- 2.17 The nearest Public Rights of Way (PRoW) to the Proposed Development Site are identified on the Definitive map of North Lincolnshire as:
- KEAD 10: a bridleway which runs north-south from Chapel Lane to a point north of Warping Drain. The southernmost point of this footpath is approximately 40m from the Water Connection Corridor; and
  - Footpath KEAD 9 which runs parallel to Warping Drain east-west from the northern terminus of Footpath KEAD 10. Footpath LUDD9 joins Footpath KEAD 10.
- 2.18 A number of other PRoW are located within the wider surrounding areas. A permissive 'traffic-free cycle route' south of the Stainforth and Keadby Canal is also noted.
- 2.19 A plan illustrating all PRoW will be provided in the PEI Report submitted for statutory consultation.
- 2.20 The Stainforth and Keadby Canal is immediately to the south of the Main Site. At the intersection with the River Trent, Keadby Lock is present which is being used from February 2020 to September 2020 during construction of Keadby 2 Power Station to facilitate the deliveries of plant and equipment via Railway Wharf. The wharf is included within the Proposed Development Site boundary to enable deliveries of plant and equipment, if required.
- 2.21 To the south of the Main Site the Scunthorpe to Doncaster passenger rail line is present; there are no existing connections or sidings into the Keadby Power Station site. There is a passenger service run by TransPennine Express every hour in each direction.
- 2.22 Vehicles using the construction access road from the A18 pass over both the Stainforth and Keadby Canal and the Scunthorpe to Doncaster passenger rail line via North Pilfrey Bridge. This bridge has been used for the delivery of wind turbine components for Keadby Windfarm and is being used during the construction period for Keadby 2. Structural limits of the bridge will be considered further in the ES for the delivery of any abnormal indivisible loads (AIL).

### Ecology

- 2.23 The Main Site comprises an area 'Keadby Common' which was previously used for arable agriculture but is currently used as a laydown and soil storage area for the construction of Keadby 2 Power Station. It is bounded by a network of field drains. The indicative laydown and biodiversity management area comprises open mosaic habitats associated with the former Keadby Ash Tip. Within the wider area of the Proposed Development Site are the construction site and laydown areas for Keadby 2 and the existing infrastructure and amenity plantings associated with Keadby 1. Surrounding the Proposed Development Site, habitats are dominated by large intensively managed arable fields, with boundaries defined by a network of field drains and ditches.

2.24 The nearest statutory and non-statutory nature conservation designations to the Proposed Development Site are illustrated on **Figure 3A (Appendix A)** as follows (distances measured to the closest part of the Proposed Development Site excluding the construction access road):

- Humber Estuary Special Area of Conservation (SAC) which encompasses the River Trent at the locations of the proposed cooling water abstraction and outfall for the Proposed Development. The SAC is designated for its estuarine and coastal habitats. It is also important for its populations of grey seal (*Halichoerus grypus*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*);
- Humber Estuary Special Protection Area (SPA) which is located 9.2km downstream, north of the Proposed Development Site. It is connected to the Proposed Development via the River Trent. The SPA is designated for its wintering assemblage of water birds, and for its populations of 10 species of wintering bird, five species of passage bird and four species of breeding bird;
- Humber Estuary Ramsar site which encompasses the River Trent at the locations of the proposed cooling water abstraction and outfall for the Proposed Development. The Ramsar site is designated as a representative example of a near-natural estuary and dependent species including internationally important bird populations and assemblages, grey seal, migratory populations of river lamprey and sea lamprey and natterjack toad (*Bufo calamita*);
- Thorne Moor SAC which is located 6km to the north-west of the Proposed Development Site and is designated for its degraded raised bog habitats still capable of natural regeneration;
- Thorne and Hatfield Moors SPA which is located 9.8km to the north-west of the Proposed Development Site and is designated for its breeding population of nightjar (*Caprimulgus europaeus*);
- Hatfield Moor SAC which is located 9.8km to the south-west of the Proposed Development Site and is designated for its degraded raised bog habitats still capable of natural regeneration;
- Humber Estuary Site of Special Scientific Interest (SSSI) which encompasses the River Trent at the locations of the proposed cooling water abstraction and outfall for the Proposed Development. The SSSI is designated for its nationally to internationally important estuary, sand dune and standing water habitats. It also supports nationally and internationally important assemblage of breeding, wintering and passage birds, grey seals, and river and sea lamprey;
- Humberhead Peatlands National Nature Reserve (NNR) which is located 6.1km north-west of the Proposed Development Site;
- Crowle Borrow Pits SSSI which is located 2.3km west of the Proposed Development Site. The SSSI is designated for its wet woodland, fen and open water habitats that support uncommon plant species;

- Hatfield Chase Ditches SSSI which is located 2.8km west of the Proposed Development Site. The SSSI is designated for its network of drainage ditches supporting nationally important assemblages of wetland plants and invertebrates;
- Eastoft Meadow SSSI which is located 3.7km north-west of the Proposed Development Site and is designated for its herb-rich hay meadow habitat;
- Thorne, Crowle and Goole Moors SSSI which is located 6km north-west of the Proposed Development Site and is designated for its lowland raised mire habitats, invertebrate assemblage and its breeding and wintering bird populations, including nightjar;
- Conesby (Yorkshire East) Quarry SSSI which is located 7km east of the Proposed Development Site and is designated for its geological interest and therefore is unlikely to be relevant to the impact assessment of the Proposed Development;
- Belshaw SSSI which is located 7.1km south-west of the Proposed Development Site and is designated for its population of greater yellow-rattle (*Rhinanthus angustifolius*), a legally protected and nationally rare species;
- Risby Warren SSSI which is located 7.6km east of the Proposed Development Site. The SSSI is designated for its 'coversand' heathland habitat;
- Messingham Heath SSSI which is located 8.9km south-east of the Proposed Development Site. The SSSI is designated for its coversand heathland habitat;
- Keadby Boundary Drain Local Wildlife Site (LWS) which is located adjacent and to the west of the Proposed Development Site. The LWS is designated for its aquatic flora and associated bank vegetation;
- Stainforth and Keadby Canal Corridor LWS which is located adjacent and to the south of the Main Site. The LWS is designated for its aquatic flora and associated bankside neutral grassland;
- Keadby Warping Drain LWS which is located adjacent to the Proposed Development Site. It is designated for its aquatic flora;
- South Soak Drain LWS, Keadby Wetland LWS and Keadby Wet Grassland LWS are all located with 50m of the Proposed Development Site boundary. A further six local LWS are located within 2km of the Proposed Development Site boundary.

2.25 In addition to nature conservation designations, the Proposed Development is located with an area of strategic importance for delivery of improved ecological networks within the Humberhead Levels Nature Improvement Area (NIA).

#### [Hydrology / Flood Risk](#)

2.26 **Figure 3C (Appendix A)** illustrates that the Proposed Development Site and surrounding areas lie within the extensive floodplain of the River Trent. The Main Site lies approximately 560m west of the River Trent whilst the Water Connection Corridors lie immediately west of the tidal River Trent which flows in a northerly direction towards the Humber Estuary.

- 2.27 The study area has a complex surface water hydrology and a long history of land drainage. The Proposed Development Site and land north of the Sheffield and South Yorkshire Navigation – Stainforth and Keadby Canal is within the Isle of Axholme and North Nottinghamshire Water Level Management Board (ANNWLMB) area.

#### Geology and Hydrogeology

- 2.28 The local geology is characterised by approximately 12m to 15m of alluvium and drift deposits of clay, silt and sand, with occasional peat layers recorded at various depths between 0.45m and 1.6m thickness. These superficial deposits overlie the Mercia Mudstone Formation which shows evidence of near surface weathering, the extent to which decreases with increasing depth.
- 2.29 The Environment Agency classifies the underlying superficial geology as Secondary A aquifer and the Mercia Mudstone as a Secondary B aquifer. The Proposed Development Site does not contain or lie in close proximity to any relevant Source Protection Zones (SPZ) (refer to **Figure 3C – Appendix A**).

#### Cultural Heritage

- 2.30 **Figure 3B (Appendix A)** illustrates that there are no World Heritage Sites, scheduled monuments, grade I or II\* listed buildings, conservation areas, registered parks and gardens, registered battlefields or protected wreck sites within the Proposed Development Site. A number of non-designated heritage assets are recorded in the North Lincolnshire Historic Environment Record (HER) within the Proposed Development Site.
- 2.31 Outside the site boundary, the closest assets are the scheduled monument and grade II listed building at Keadby Lock on the Stainforth and Keadby Canal (NHLE 1005204; 1342734), located approximately 160m south of the Water Connection Corridor. The surrounding landscape contains notable concentrations of listed buildings in Althorpe, Crowle (also a conservation area) and Eastoft. There are isolated and smaller groupings of listed buildings in the surrounding landscape. One further scheduled monument lies within 5km of the Main Site area at Flixborough Saxon Nunnery and Site of All Saints Medieval Church and Burial Ground (NHLE 1009382). The non-designated Isle of Axholme area of Special Historic Landscape Interest (saved policy LC14 of the North Lincolnshire Local Plan) lies 2km south of the Main Site.

#### Landscape

- 2.32 The Proposed Development Site lies within the Humberland Levels National Character Area (NCA) which is a flat, low-lying and large scale agricultural landscape (Natural England, 2014). There is widespread evidence of drainage history, in particular from the 17<sup>th</sup> century, in the evidence of ditches, dykes and canalised rivers. The flat landscape enables extensive, unbroken views where vertical structures including power stations and wind turbines, are very prominent.

- 2.33 The Proposed Development Site lies within the Trent Levels Landscape Character Area (LCA) within the North Lincolnshire Landscape Character Assessment and Guidelines (Estell Warren Landscape Architects, 1999). This LCA is characterised as a flat, open floodplain landscape with long distance views with little diversity in character.
- 2.34 Sensitive visual receptors are located within nearby settlements including Keadby, Althorpe and Gunness and local PRow including the National Trail along the River Trent.

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### 3.0 THE PROPOSED DEVELOPMENT

#### Overview

- 3.1 The Proposed Development comprises the construction, operation and maintenance of a Low Carbon CCGT generating station with a capacity of up to 910MW electrical output to be located on land in the vicinity of the existing Keadby Power Stations (Keadby 1 and Keadby 2) near Scunthorpe in North Lincolnshire (the Proposed Development Site).
- 3.2 At this stage in the development of the Project, the final technology selection cannot yet be made, as it will be determined by various technical and economic considerations and will be influenced by future UK Government policy. The design of the Proposed Development, therefore, incorporates a necessary degree of flexibility in the choice of low carbon technology, to allow for the future selection of the preferred technology in the light of prevailing policy and market conditions once a DCO is granted.
- 3.3 It is expected that the preferred low carbon technology option would be confirmed prior to submission of the DCO Application, and the Rochdale Envelope used and assessed will therefore be narrowed accordingly. However, it is not expected that the final vendor selection for any hydrogen firing equipment or CCP would be made until the detailed design stage of the Proposed Development, which occurs after Final Investment Decision and post the granting of any DCO. Therefore, the Rochdale Envelope that is applied will always need to retain some flexibility to allow different vendor equipment to be selected at a later date.
- 3.4 This flexibility relates to installing the necessary infrastructure to enable the CCGT to be fired primarily on hydrogen fuel or to enable CO<sub>2</sub> from a conventional natural gas fired CCGT unit to be captured, compressed and exported for offshore storage. This flexibility is sought in order to allow the Applicant to optimise the Proposed Development, as the UK Government develops its policy and investment framework to support low carbon technologies.
- 3.5 As a low carbon CCGT, the Proposed Development comprises one high efficiency CCGT unit and associated steam turbine and (while currently considering two low carbon options) the infrastructure required to allow the CCGT to fire on hydrogen gas as opposed to natural gas.
- 3.6 The Proposed Development also includes the alternative of a post combustion Carbon Capture Plant (CCP) in a scenario where natural gas is used as the fuel, in order to make the plant fully Carbon Capture, Utilisation and Storage (CCUS) enabled, with the option to connect it to the HLC Cluster pipeline being developed.
- 3.7 The inclusion of a capability to allow the future use of hydrogen firing and the option of installing a CCP within the DCO go further than the requirements of current legislation and guidance (including the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013) which require power stations of the size of the Proposed Development to be 'carbon capture ready' (CCR) for future unspecified design and consent of a CCP. This is because the Applicant recognises the importance of delivering a project that is consistent

with the drive to net zero and that supports decarbonisation of the UK electricity supply network as well as the development of a hydrogen economy in the Yorkshire and Humber Region.

- 3.8 At this stage therefore, the Applicant proposes to retain and consider both the option to operate the CCGT in an alternate low carbon mode by firing on hydrogen gas fuel and the option to install a CCP. By firing on hydrogen, there are no associated emissions of CO<sub>2</sub> in the exhaust gas and a CCP would not be required. This option is dependent on the availability of hydrogen gas fuel, with hydrogen supply options being developed by a number of third parties. Alternatively, the plant could fire on natural gas with the CO<sub>2</sub> emissions captured in the CCP and directed to an offshore geological store through the HLC infrastructure. As the hydrogen economy develops regionally, a further alternative may include firing on a low carbon fuel gas blend (natural gas stream enriched with hydrogen).
- 3.9 Operation of the CCGT with post combustion CCP or operation of the CCGT with hydrogen firing are both feasible. The option developed will be influenced by the development of CCUS and hydrogen infrastructure associated with the HLC off-site and changes in UK Government policy on decarbonisation, which are not within the control of the Applicant. As such, the design of the CCP will be progressed to allow construction to be commenced as soon as market conditions allow.
- 3.10 Given the uncertainty of the timing on Government policy and third party infrastructure regarding the deployment of CCUS/ hydrogen and decarbonisation of the power sector, the decision as to whether to install CCP capability or equipment to enable hydrogen firing cannot yet be made. Further design work is ongoing to determine the feasibility of each approach with the intention being to select the preferred technology envelope prior to submission of the DCO Application. Environmental and technical assessment work for both options will therefore continue until this decision is made. The work will also define the time-scale for that low carbon option to be developed, working with third parties for any required connecting hydrogen or CO<sub>2</sub> infrastructure. Installation of the preferred low carbon technology may only be possible after construction of the Proposed Development. Accordingly, the Proposed Development may need to be constructed in a staged manner, with the power generation elements (the CCGT and the infrastructure to allow firing on natural gas) constructed in advance of any CCP and HLC CO<sub>2</sub> export pipeline or infrastructure to enable 100% firing on hydrogen.
- 3.11 As a result, there may be a period of time when the CCGT is operating in advance of the deployment of the CCP and wider CCUS infrastructure or the available fuel to allow firing on hydrogen. In this case, the CCGT would fire on natural gas with carbon emissions controlled through the integral high efficiency of the plant, in a manner similar to other modern highly efficient CCGT power stations.
- 3.12 Each of these operational modes (natural gas fired, hydrogen fired and CCGT with CCP) may produce slightly different impacts in terms of height and massing of structures, emissions to air, discharges to water and generation of waste. The EIA undertaken to support the application for development consent will assess the worst-case for each environmental



effect utilising the Rochdale Envelope approach to define an overall consenting envelope that encompasses the worst-case emissions and maximum extent of the physical infrastructure and considering the different potential modes of operation.

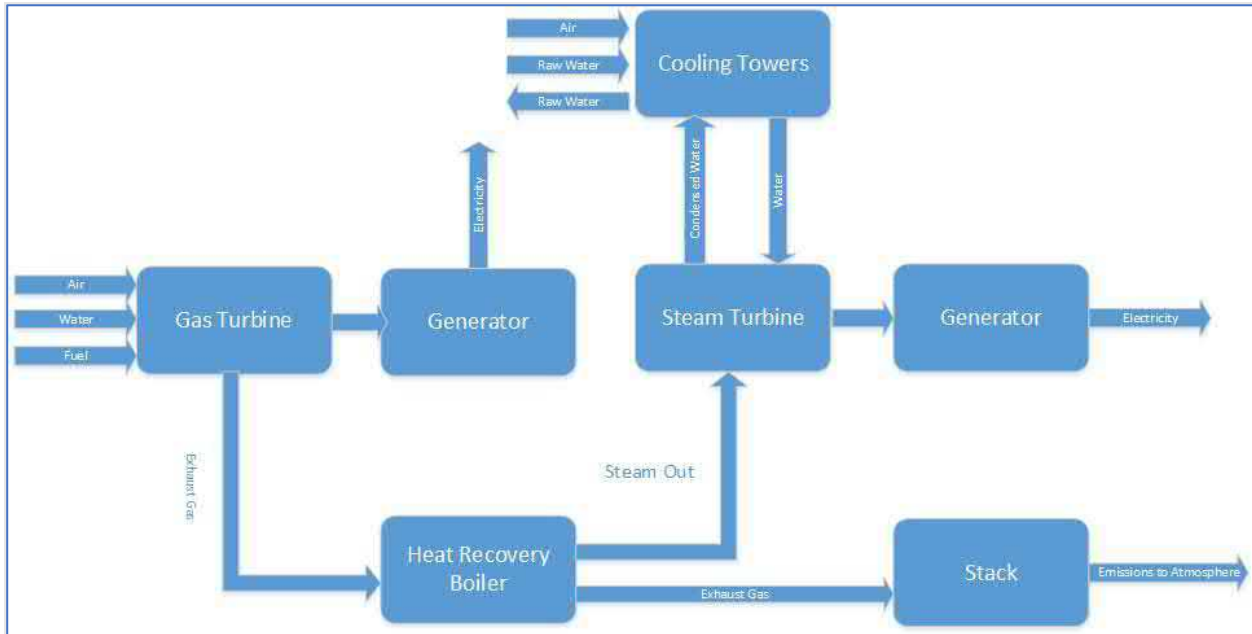
- 3.13 Two options are currently being evaluated for the layout of the various components of the Proposed Development; these are summarised below:
- location of the CCGT on the current Keadby 2 laydown area with the CCP co-located in this area or the former tank farm; or
  - location of the CCGT and CCP on land to the west of the existing National Grid substation to the north of the Keadby 2 laydown area.
- 3.14 A conceptual layout for the Proposed Development is provided as **Figure 2B (Appendix A)**. The layout will be developed following further engineering evaluation, consultation with stakeholders and on conclusion of further technical and environmental studies. The preferred site layout is expected to be made prior to statutory consultation on the Application for DCO for the Proposed Development.
- 3.15 The following sections describe the various elements of the Proposed Development in more detail.

#### **Combined Cycle Gas Turbine Unit**

- 3.16 In a CCGT power station, a gas fuel (typically natural gas, although hydrogen can also be used) is combusted to drive a gas turbine, which is connected to a generator producing electricity. As an amount of usable heat remains in the gas turbine exhaust, this is passed into a Heat Recovery Steam Generator (HRSG, a type of boiler) to make steam to generate additional electricity via a steam turbine.
- 3.17 The waste gases from the heat recovery boiler are released into the atmosphere via an exhaust stack, following appropriate treatment.
- 3.18 The exhaust steam from the steam turbine is condensed (cooled) back into water which is returned to the HRSG to continue the process. This cooling would be achieved through the use of hybrid wet/ dry cooling towers using make up water that is either abstracted from the River Trent (located approximately 500m to the east of the Main Site at its closest point) or from the Stainforth and Keadby Canal immediately to the south of the Main Site. The decision as to which source is used for the cooling water make-up is being determined through engineering and environmental studies.
- 3.19 The Proposed Development is anticipated to consist of one CCGT unit with a total output of up to 910 MegaWatts electrical output (MW(e)). The electrical efficiency of a modern CCGT power station is greater than 62%, which is considerably higher than that for a conventional coal, biomass or oil-fired generating plant, or the existing UK fleet of gas fired power stations.

3.20 A schematic of the power generation process associated with the Proposed Development is provided below in Plate 1.

**Plate 1: Power Generation Process (for a multi-shaft generation module)**



3.21 In addition to the electrical generating plant, the following infrastructure will be required:

- the provision of new gas pipework across the Main Site to convey gas fuel (hydrogen and/or natural gas) to the CCGT unit. Natural gas would be supplied from the existing gas pipeline associated with Keadby 1 and 2, whereas a new pipeline connection into the Main Site would be necessary to supply hydrogen (refer to under ‘Hydrogen Firing’ below);
- a new Above Ground Installation (AGI) adjacent to the CCGT to receive the gas fuel;
- new cooling water infrastructure to provide make-up water for the hybrid towers from the River Trent/ Stainforth and Keadby Canal, with additional infrastructure installed at the River Trent to comply with the Eels (England and Wales) Regulations 2009;
- Selective Catalytic Reduction (SCR) infrastructure to remove oxides of nitrogen (NO<sub>x</sub>) from the CCGT exhaust gas stream, consisting of a catalyst chamber, associated pipework and fans and reagent storage vessels;
- electricity transmission infrastructure to connect the CCGT to the National Grid electricity transmission system through the existing substation located within the Proposed Development Site;
- ancillary infrastructure including:
  - an auxiliary boiler;
  - workshop and stores;

- electrical, control room and administration building;
- water treatment plant, fire pumps and laboratory;
- cooling water pump house;
- above ground raw and fire water tank;
- above ground demineralised water tank;
- back-up diesel generators, comprising skid-mounted units;
- waste water treatment plant; and
- additional access roads and car parking.

### Hydrogen firing

3.22 In the event that hydrogen firing is selected as the low carbon option, no CCP would be required for the Proposed Development. Instead, the following infrastructure (additional to the natural gas fired CCGT) would be installed:

- on site hydrogen pipework and hydrogen AGI. This would be an additional pipeline across the site from a selected AGI location. The hydrogen AGI would be in addition to the AGI proposed for the natural gas fired CCGT and co-located on the same part of the Proposed Development site. It is assumed that the hydrogen supply infrastructure will be developed by third party to connect into Site;
- air separation unit and nitrogen compression and storage facility. Hydrogen firing may require supplementary nitrogen to displace some oxygen to manage the combustion process and regulate the flame temperature. This facility would extract nitrogen from the ambient air and store it to allow it to be injected into the air intake stream for the gas turbines.

3.23 Natural gas would still be required for the start-up of a hydrogen fired CCGT, but when running at full load the plant would run on up to 100% hydrogen fuel.

### Carbon Capture Plant and Ancillary Infrastructure

3.24 As discussed above, the Proposed Development includes for the future installation of equipment to facilitate the capture of CO<sub>2</sub> produced through the combustion of natural gas in the CCGT, should this technology option be selected as the preferred low carbon pathway.

3.25 The Applicant proposes that this would be facilitated through a method of post-combustion amine stripping in a dedicated CCP.

3.26 This involves capturing and cooling the exhaust gases from the CCGT and passing them through an absorber column, containing a liquid amine based chemical solvent, to dissolve the CO<sub>2</sub> and remove it from the exhaust gas which is then released to atmosphere. The CO<sub>2</sub> rich solvent is heated and passed to a stripper column to liberate the CO<sub>2</sub> gas. This gas is then cooled and compressed and is likely to then be transported by a pipeline connecting

on site into the HLC Cluster infrastructure for subsequent compression and transport to offshore geological storage site. The lean solvent is returned to the absorber column to repeat the cycle.

3.27 The CCP would consist of the following principal infrastructure:

- exhaust gas cooling and conditioning plant;
- absorber column;
- heat exchangers;
- solvent reclaimer tower;
- reboiler;
- cooling provision either through an air-cooled condenser array or additional hybrid cooling towers and associated infrastructure;
- chemical and waste storage facilities (including for hazardous materials);
- CO<sub>2</sub> cooling and compression plant;
- effluent treatment plant; and
- ducting and pipework.

3.28 The route of the HLC Cluster CO<sub>2</sub> transport pipeline is currently being evaluated by National Grid Ventures, but they have confirmed that it will be routed into the Keadby Power Station site en route to an outfall location on the coast, with the final route being determined to connect as many major emitters as feasible to do so.

### Access

3.29 Access to the Proposed Development Site during the construction phase for HGV construction traffic could be via the existing access road from the A18 that was constructed in line with the transport conditions imposed for the consented development for Keadby 2, requiring heavy commercial traffic not to be routed through Keadby village. The location of this access is included within the Proposed Development Site boundary on **Figure 2A (Appendix A)**. The use of Keadby Lock to facilitate the delivery of plant and equipment by barge is also included as an option for the Proposed Development, given that it is being successfully applied on the construction of Keadby 2 Power Station currently.

3.30 Access to the Proposed Development Site for the operational traffic would be facilitated by the existing accesses for the operation of Keadby 1 and the construction of Keadby 2 from the south via Pilfrey Bridge.

### Preparation of the Site

3.31 The Proposed Development Site is located within the curtilage of the Keadby Power Station site. The ground conditions vary across the site depending on their historical use. Given

the nature of the former site operations, it is possible that subsurface contamination may be present.

- 3.32 Accordingly, an extensive soil and groundwater investigation would be undertaken prior to commencing construction. The design and extent of this investigation would be based on the final design and would be conducted to also provide the necessary information to inform the requirements of an Environmental Permit that is required by the Environment Agency for the operation of the Proposed Development.
- 3.33 No substantial changes to existing site levels are proposed and therefore no significant spoil movements are envisaged into or from the Proposed Development Site to support the construction of the Proposed Development. Cut and fill volumes are intended to be balanced across the Site.

### **Construction Programme and Management**

- 3.34 Subject to being granted development consent and following a final investment decision, it is anticipated that construction will commence in 2023, and last approximately three to four years.
- 3.35 The ES will provide further details of the proposed construction activities and their anticipated duration, along with an indicative programme of each phase of the works, including the construction of the CCGT, construction of the CCP or infrastructure to support hydrogen firing.
- 3.36 The ES will be supported by a framework Construction Environmental Management Plan (CEMP), which will describe the specific mitigation measures to be followed to reduce impacts from:
- construction traffic (including parking and access requirements);
  - earthworks;
  - noise and vibration;
  - works on the River Trent or Stainforth and Keadby Canal;
  - dust generation; and
  - waste generation.
- 3.37 The detailed CEMP will be secured by a requirement attached to any DCO that is granted and will identify the relevant procedures to be adhered to throughout construction.
- 3.38 Contracts with companies involved in the construction works will incorporate environmental control, health and safety regulations and current guidance with the intention that construction activities are sustainable and that all contractors involved with the construction stages are committed to agreed best practice and meet all relevant environmental legislation including: Control of Pollution Act 1974 (COPA), Environment Act 1995 and Hazardous Waste (England and Wales) Regulations 2005.

3.39 All construction works will adhere to the Construction (Design and Management) Regulations 2015 (CDM).

### **Decommissioning**

3.40 The Proposed Development is expected to operate for at least 25 years. At the end of operation, it is expected that the Proposed Development will have some residual life remaining and an investment decision would then be made based on the market conditions prevailing at that time. If the operating life were to be extended, the Proposed Development would be upgraded in line with the legislative requirements at that time.

3.41 At the end of its operating life, the most likely scenario is that the Proposed Development would be shut down and all above ground structures removed from the Site. The Site would then be suitably remediated as required to facilitate re-use.

3.42 A Decommissioning Plan (including Decommissioning Environmental Management Plan) would be produced and agreed with the Environment Agency as part of the Environmental Permitting and site surrender process. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the Site and contain guidance on how risks can be removed or mitigated. This would include details of how surface water drainage should be managed on the CCGT and CCP site during the decommissioning and demolition.

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## 4.0 PROJECT ALTERNATIVES

- 4.1 The EIA Regulations require that an ES should include an outline of the main alternatives that have been studied by the Applicant and an indication of the main reasons for its choices, taking into account the likely significant environmental impacts of each alternative. Under the EIA Regulations there is no requirement to assess alternatives, only a requirement to provide a review of those alternatives that have actually been considered.
- 4.2 For the Proposed Development alternative development locations on the Site are being evaluated and siting at other sites has also been considered. It is proposed that other project alternatives will be considered as the DCO application progresses including:
- the layout of the Proposed Development including the choice and configuration of the CCGT units;
  - the low carbon technology to be selected;
  - the cooling technology and water source to be implemented; and
  - the route corridors across the site for connections to the electricity and gas networks and hydrogen and HLC Cluster pipelines.
- 4.3 Where alternatives are examined and assessed during the pre-application process, details of the options and reasons for selection (or otherwise) will be included within the ES for the Proposed Development. Where, at the time of Application, alternatives still exist for any particular element of the Proposed Development, the assessments to be included within the EIA and presented in the ES will consider and assess the 'worst-case' impacts, in accordance with the Rochdale Envelope approach outlined in PINS Advice Note 9: Using the Rochdale Envelope (Planning Inspectorate, 2018).

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## 5.0 PLANNING POLICY AND NEED

5.1 This section sets out the main planning policy documents taken into account in defining the scope of the EIA and which are most relevant to the Proposed Development.

### **National Planning Statements (NPS) and Marine Policy Statements (MPS)**

5.2 The policy framework for examining and determining applications for NSIP is provided by NPS. Section 104 of the 2008 Act requires that applications for NSIP be determined in accordance with any NPS which has effect in relation to development of the description to which the application relates, and the appropriate marine policy documents (if any), unless this would:

- lead to the UK being in breach of its international obligations;
- be in breach of any statutory duty that applies to the Secretary of State;
- be unlawful;
- the adverse impacts of the development outweigh its benefits; or
- be contrary to any Regulations that may be made prescribing other conditions.

5.3 In July 2011, the Secretary of State for Energy and Climate Change ('DECC' which is now part of the Department for Business, Energy and Industrial Strategy) designated a number of NPS relating to nationally significant energy infrastructure. The NPS that are of relevance to the Proposed Development include:

- Overarching National Policy Statement for Energy (EN-1) ('EN-1') (DECC, 2011a); and
- National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2) ('EN-2') (DECC, 2011b).

5.4 The appropriate marine policy documents are the UK Marine Policy Statement (HM Government, Northern Ireland Executive, Scottish Government, Welsh Assembly Government, 2011) and the East Inshore and East Offshore Marine Plan (Department for Environment, Food and Rural Affairs, 2014).

5.5 These documents, from a planning policy perspective, have been the main focus in terms of scoping the EIA.

5.6 Part 3 of EN-1 (DECC, 2011a) sets out the need for nationally significant energy infrastructure. Paragraph 3.1.1 states that the UK 'needs all the types of energy infrastructure covered by this NPS in order to achieve energy security' and that the 'Government does not consider it appropriate for planning policy to set targets for or limits on the different technologies' (Paragraph 3.1.2).

5.7 Section 3.3 of Part 3 of EN-1 (DECC, 2011a) sets out why the Government believes that there is an urgent need for new electricity infrastructure, including:



- meeting energy security and carbon reduction objectives – all types of energy infrastructure covered by the NPS are needed to achieve energy security in the UK at the same time as reducing greenhouse gas emissions;
- the need to replace closing electricity generating capacity – at least 22 GW of existing electricity generating capacity will need to be replaced in the coming years, as a result of aging power stations and tightening environmental regulation. Additionally, 10 GW of nuclear generating capacity is expected to close over the next 20 years;
- the need for more electricity capacity to support the increased supply from renewables – decarbonisation of electricity generation is reliant on a dramatic increase in the amount of renewable energy; however, some renewable sources (such as wind, solar and tidal) are intermittent and cannot be adjusted to meet demand. Furthermore, EN-1 recognises that there will still be a role for fossil fuel generation to provide a cost-effective means of ‘back up’ electricity generation at short notice to support renewable technologies; and
- future increases in electricity demand – the demand for electricity is expected to increase and total electricity consumption could double by 2050. Depending upon the choice of how electricity is supplied, total capacity may need to more than double to be sufficiently robust to all weather conditions.

5.8 Paragraph 3.3.15 states the urgency at which new energy infrastructure should be brought forward as soon as possible and certainly within the next 10-15 years (from 2011).

5.9 Paragraphs 3.6.4 – 3.6.7 confirm the importance of Carbon Capture Readiness (‘CCR’) at fossil fuelled power stations.

5.10 Part 4 of EN-1 sets out a number of ‘assessment principles’ that must be taken into account by applicants and the Secretary of State in preparing and determining applications for nationally significant energy infrastructure. General points include (paragraph 4.1.2) the requirement for the Secretary of State, given the level and urgency of need for the infrastructure covered by the energy NPS, to start with a presumption in favour of granting consent for applications for energy NSIP. This presumption applies unless any more specific and relevant policies set out in the relevant NPS clearly indicate that consent should be refused or any of the considerations referred to in Section 104 of the 2008 Act (noted above) apply.

5.11 Paragraph 4.1.3 goes on to state that in considering any project, and in particular, when weighing its adverse impacts against its benefits, the Secretary of State should take into account:

- its potential benefits, including its contribution to meeting the need for energy infrastructure, job creation and any long-term or wider benefits; and
- its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.

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- 5.12 Paragraph 4.1.4 continues by stating that within this context the Secretary of State should take into account environmental, social and economic benefits and adverse impacts, at national, regional and local levels.
- 5.13 Other assessment principles include the matters to be covered within any ES, the Habitats and Species Regulations; the consideration of alternatives; criteria for 'good design'; consideration of CHP; consideration of CCS and CCR; climate change adaptation; and grid connection, amongst others.
- 5.14 Part 5 of EN-1 (DECC, 2011a) lists a number of 'generic impacts' that relate to most types of energy infrastructure, which both applicants and the Secretary of State should take into account when preparing and considering applications. These include air quality and emissions; biodiversity; landscape and visual; and flood risk impacts, amongst others. Paragraph 5.1.2 stresses that the list of impacts is not exhaustive, and that applicants should identify the impacts of their projects in the ES in terms of both those covered by the NPS and others that may be relevant. In relation to each of the generic impacts listed within Part 5 of EN-1, guidance is provided on how the applicant should assess these within their application and also the considerations that the Secretary of State should take into account in decision-making.
- 5.15 EN-2 (DECC, 2011b) confirms the vital role fossil fuel generating stations will play in providing reliable electricity supplies and a secure and diverse mix as the UK makes its transition towards a secure decarbonised electricity system. It also restates from EN-1 (DECC, 2011a) the Government policy that all new generating stations should be required to capture and store the carbon emissions from a substantial proportion of their capacity.
- 5.16 EN-2 (DECC, 2011b) confirms at Paragraph 2.3.4 that the Secretary of State should not give development consent for new combustion generating stations with a generating capacity at or over 300 MW unless it is satisfied that the proposed development meets all the criteria for CCR set out in EN-1 (DECC, 2011a).
- 5.17 Section 2.4 confirms the impacts of fossil fuel generating stations, as set out in the generic impacts identified in Part 5 of EN-1 (DECC, 2011a), providing additional detail on air emissions, landscape and visual, noise and vibration, water quality and resources, amongst others.
- 5.18 The UK Marine Policy Statement ('the MPS') is the framework for preparing Marine Plans and taking decisions affecting the marine environment. It establishes a vision for the marine environment, which is for 'clean, healthy, safe, productive and biologically diverse oceans and seas'. The MPS underpins the process of marine planning, which establishes a framework of economic, social and environmental considerations in that will deliver these high level objectives and ensure the sustainable development of the UK marine area.
- 5.19 Relevant high level marine objectives relevant to the Proposed Development include;
- achieving a sustainable marine economy:
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- infrastructure is in place to support and promote safe, profitable and efficient marine businesses.
- ensuring a strong, healthy and just society:
  - people appreciate the diversity of the marine environment, its seascapes, its natural and cultural heritage and its resources and act responsibly.
  - the use of the marine environment is benefiting society as a whole, contributing to resilient and cohesive communities that can adapt to coastal erosion and flood risk, as well as contributing to physical and mental wellbeing.
  - the coast, seas, oceans and their resources are safe to use.
  - the marine environment plays an important role in mitigating climate change.
  - there is equitable access for those who want to use and enjoy the coast, seas and their wide range of resources and assets and recognition that for some island and peripheral communities the sea plays a significant role in their community.
- living within environmental limits:
  - biodiversity is protected, conserved and where appropriate recovered and loss has been halted.

5.20 Chapter 3 sets out sectoral issues, such as defence and national security, ports and shipping, and marine aggregates. A recognised sector is energy production and infrastructure development (3.3). It is recognised that the UK offshore area is considered to be one of the most promising locations anywhere in the world to permanently store CO<sub>2</sub> (paragraph 3.3.31)

5.21 The East Inshore and East Offshore Marine Plans (Department for Environment, Food and Rural Affairs, 2014) establishes the plan led system for the marine area in which the riverine parts of the Proposed Development Site are located.

5.22 In section 2 the vision and objectives for the East marine plan areas is stated. The vision (page 23) comprises:

*“By 2034, sustainable, effective and efficient use of the East Inshore and East Offshore Marine Plan Areas has been achieved, leading to economic development while protecting and enhancing the marine and coastal environment, offering local communities new jobs, improved health and well-being. As a result of an integrated approach that respects other sectors and interests, the East marine plan areas are providing a significant contribution, particularly through offshore wind energy projects, to the energy generated in the United Kingdom and to targets on climate change.”*

5.23 Section 3 comprises the plan policies. Key policies include:

- Policy EC1: *“Proposals that provide economic productivity benefits which are additional to Gross Value Added currently generated by existing activities should be supported.”*

- Policy EC2: *“Proposals that provide additional employment benefits should be supported, particularly where these benefits have the potential to meet employment needs in localities close to the marine plan areas.”*
- Policy SOC3, which requires that proposals that affect the terrestrial or marine character of an area firstly avoid, or then mitigate, or then justify, these effects.
- Policy BIO1, which requires appropriate weight should be attached to biodiversity using an evidence based approach.
- Policy BIO2, which requires that where appropriate, proposals for development should incorporate biodiversity and geological enhancement.
- Policy CCS1, which seeks to ensure that sufficient offshore storage sites are available for CCS over the long term in view of the importance of the East marine areas to England’s CCS potential.
- Policy CCS2, which requires CCS proposals to demonstrate consideration of the re-use of existing oil and gas infrastructure rather than the installation of new infrastructure.
- Policy CC1, which requires proposals to incorporate climate change mitigation and adaptation and minimise impacts on adaptation and mitigation measures.
- Policy CC2, which requires the minimisation of greenhouse gas emissions.
- Policy PS3, which requires that proposals firstly avoid, or then mitigate, or then justify, interfering with current and future port and harbour expansion opportunities.

5.24 Section 3.11 ‘Carbon Capture and Storage’ recognises that combustion (e.g. gas fired) power stations may want to utilise coastal or estuarine sites within the East inshore plan area to make use of once through water cooling systems for efficiency and economic purposes (paragraph 325).

5.25 Paragraph 326 recognises that:

*“The East marine plan areas afford a significant opportunity for the industry due to the large number of saline aquifers within the Bunter sandstone formation. Saline aquifers are estimated as having around 85% of the United Kingdom’s potential storage capacity. Also, there are significant active and inactive hydrocarbon fields that could be used for storage. In addition, several clusters of industrial facilities emitting large amounts of carbon dioxide occur along England’s East coast.”*

#### **Other Matters that may be ‘Important and Relevant’**

5.26 In making decisions on applications for NSIP, Section 104 of the 2008 Act states that the Secretary of State must also have regard to any other matters that they consider to be both ‘important and relevant’ to their decision.

5.27 A body of recent energy and climate change law, policy and guidance is of potential relevance and is described below. Collectively these provide further support to the urgent

need for new energy infrastructure, including CCS and unabated fossil fuel plant, set out in NPS EN-1 (DECC, 2011a), providing energy security and supporting the development of hydrogen turbines and CCUS clustering in support of a net zero economy.

- 5.28 Paragraph 4.1.5 of EN-1 provides some clarification on the other matters that the Secretary of State may consider both important and relevant, such as national planning policy and local plan documents. These are also described below.

#### National Infrastructure Plan

- 5.29 The National Infrastructure Plan (HM Treasury, 2014) (the ‘NIP 14’) sets out a vision for the UK’s infrastructure, reinforcing the Government’s commitment to investing in infrastructure and improving its quality and performance.
- 5.30 Paragraph 8.3 states that large-scale investment in gas and low-carbon electricity generation is vital in order to replace ageing energy infrastructure, maintain secure energy supplies and meet legally binding environmental targets. Around £100 billion of investment is estimated to be required in electricity generation and networks by 2020. Paragraph 8.5 continues:
- 5.31 *“As legacy coal, gas and nuclear power stations come offline, they will increasingly be replaced with a combination of renewable energy, new nuclear power and fossil fuel power stations fitted with Carbon Capture and Storage (CCS) technology. New gas plant is also needed as a vital backup for less flexible renewable generation and to ensure that the system can meet peak electricity demand. Demand for gas to supply heat to homes and businesses will also remain significant for some time to come.” [underlining added]*

#### Clean Growth Strategy

- 5.32 The ‘Clean Growth Strategy – Leading the way to a low carbon future’ (Department for Business, Energy & Industrial Strategy, 2017) (‘the CGS’) sets out the aims of the Government to deliver increased economic growth while reducing carbon emissions.
- 5.33 The Executive Summary (page 9) confirms that for the UK to achieve its fourth and fifth carbon budgets (2023-27 and 2028-2032) it will be necessary to drive a significant acceleration in the pace of decarbonisation.
- 5.34 Page 42 recognises that the flexibility of hydrogen as a low carbon fuel could enable it to play a complementary and enabling role in the decarbonisation of the power sector, in particular addressing the challenges of intermittency and long-term storage.
- 5.35 Page 69 deals with CCUS in detail. It states:
- 5.36 *“There is a broad international consensus that carbon capture, usage and storage (CCUS) has a vital role in reducing emissions. This could be across a wide range of activities such as producing lower-emission power, decarbonising industry where fossil fuels are used and/or industrial processes as well as providing a decarbonised production method for hydrogen*

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*which can be used in heating and transport. This makes CCUS a potentially large economic opportunity for the UK. The International Energy Agency estimates there will be a global CCUS market with over £100 billion – even a modest share of this global market, UK GVA could increase between £5 billion and £9 billion per year by 2030.”*

- 5.37 Subsequently in September 2019, one of the ‘Grand Challenges’ missions set by the UK Government was confirmed ‘to establish the world’s first net-zero carbon industrial cluster by 2040 and at least 1 low-carbon cluster by 2030’. In March 2020, £800 million funding was confirmed in the Budget to establish two or more new carbon capture and storage clusters by 2030. The Proposed Development is sited to be able to connect into the HLC Cluster.
- 5.38 Pages 93 - 101 of Chapter 4 cover ‘Delivering Clean, Smart, Flexible Power’. The overriding objective is to deliver a reduction in emissions from the power sector. Page 96 states that in order to achieve this it will be necessary to continue to bring down the costs of low carbon generation from renewables and nuclear and ensure that the UK can deploy CCUS at scale during the 2030s. Page 101 reiterates that Government’s commitment to supporting CCUS innovation and deployment through the BEIS Energy Innovation Programme.

[Clean Growth - The UK Carbon Capture Usage and Storage deployment pathway - An Action Plan](#)

- 5.39 ‘Clean Growth – The UK Carbon Capture Usage and Storage deployment pathway - An Action Plan’ (Department for Business, Energy & Industrial Strategy, 2018) (‘the Action Plan’) was published by the Government in 2018. The Executive Summary (pages 5 and 6) confirms that the Government’s vision is for the UK to become a global leader in CCUS. The Action Plan is aimed at enabling the development of the first CCUS facility in the UK, with commissioning in the mid-2020s, which would support the ambition of being able to deploy CCUS at scale during the 2030s, subject to the costs coming down sufficiently. It goes on to state (page 6):
- 5.40 *“Through our Clean Growth Strategy we re-affirmed our commitment to the domestic deployment of CCUS subject to cost reductions. This Plan sets out our next steps to progress this commitment.”*
- 5.41 The Action Plan goes on to state that this can only be achieved through close Government and Industry partnership (page 14). The Committee on Climate Change (‘CCC’) is quoted as emphasising the importance of CCUS to cost reductions *“as well as its crucial role in enabling deeper emissions reduction.”*

[The Climate Change Act 2008 \(2050 Target Amendment\) Order](#)

- 5.42 The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (June 2019) enshrines in law the Government’s commitment to achieve ‘net zero’ in terms of greenhouse gas emissions by 2050. This is in line with the recommendations of the Committee for Climate Change (‘CCC’).

- 5.43 The executive summary to the CCC report (The Committee on Climate Change, 2019) (page 12) states that the net zero target cannot be met simply by adding mass removal of carbon dioxide on to existing plans for the previous target of an 80% reduction by 2050 compared to 1990 levels. It highlights that CCUS is crucial to the delivery of zero greenhouse gas emissions and that it is of strategic importance to the economy. However, it raises concern that of the 43 large-scale CCUS projects operating worldwide, none are in the UK.
- 5.44 The report states that the remaining greenhouse gas emissions in the UK must be offset by removing CO<sub>2</sub> and permanently sequestering it through technologies such as CCUS. The report highlights the necessity of CCUS in terms of capturing the carbon dioxide from the production of hydrogen (given that a move to a hydrogen economy is critical to achieving net zero) and from non-renewable electricity production (page 23).

### **The Future of Hydrogen – Seizing today’s opportunities**

- 5.45 ‘The Future of Hydrogen’ (International Energy Agency, June 2019) sets out the current status of hydrogen as an energy source; the ways in which hydrogen can help to achieve a clean, secure and affordable energy future; and how to realise its potential. The study, carried out in collaboration with governments, industry and academia, contains recommendations for immediate opportunities and for scaling up hydrogen.
- 5.46 The report identifies that hydrogen can enable renewables to make an even greater contribution and manage their variable output. The report states that the opportunity should be taken now to scale up technologies and bring down costs to allow hydrogen to become widely used. For hydrogen to make a significant contribution to the clean energy transition, it needs to be adopted in sectors in which it is currently absent, including transport and power generation.
- 5.47 Seven key recommendations are set out:
- establish a role for hydrogen in long-term energy strategies (including in the power generation sector);
  - stimulate commercial demand for clean hydrogen;
  - address investment risks of first-movers;
  - support research and development to bring down costs;
  - eliminate unnecessary regulatory barriers and harmonise standards;
  - engage internationally and track progress; and
  - focus on four key opportunities to further increase momentum over the next decade: turn existing industrial ports into hubs for lower carbon hydrogen, use existing gas infrastructure to spur new clean hydrogen supplies, support transport fleets, freight and corridors using fuel cell vehicles, and establish shipping routes for international hydrogen trading.

### Net Zero – Opportunities for the Power Sector

- 5.48 ‘Net Zero - Opportunities for the Power Sector’ (National Infrastructure Commission, 2020) states that decarbonising the power sector is integral to achieving the goal of net zero by 2050.
- 5.49 The National Infrastructure Commission (NIC) provides impartial advice to the government on infrastructure needs and solutions. Its terms of reference are set by government, and while NIC recommendations do not constitute government policy, the government is required to formally respond to the recommendations, and they may form the evidence base for future policy.
- 5.50 Core to the NIC recommendations (page 7) is that:
- “a highly renewable power system, combined with flexible technologies including hydrogen powered generation, could be substantially cheaper than alternatives that rely heavily on a fleet of nuclear power plants.”*
- 5.51 The NIC has identified that increasing the proportion of renewables on the system does not materially impact the cost of the system and that *“future system costs may even be lower if action is taken to test the feasibility of deploying hydrogen turbines, an emerging technology for the power sector,”* (page 5). This is because hydrogen turbines displace many other non-renewable forms of generation and flexibility, reducing the necessary installed capacity of these technologies, and hence system costs.
- 5.52 Page 18 of the NIC recommendations acknowledges that there will be a mix of technologies in net zero power systems, including unabated thermal (with low running hours) and at least 18 gigawatts (GW) of gas CCS capacity by 2050, generating 23 terawatt hours (TWh) of electricity. By 2050 it is expected that this will primarily play a peaking role in the electricity system.

### National Planning Policy Framework and Planning Practice Guidance

- 5.53 The latest version of the National Planning Policy Framework (NPPF) was adopted in February 2019 (Ministry of Housing, Communities and Local Government, 2019a). The policies contained within the NPPF are expanded upon and supported by the ‘Planning Practice Guidance’ (Ministry of Housing, Communities and Local Government, 2019b).
- 5.54 The NPPF sets out the Government’s planning policies for England and how these are to be applied. It is a material consideration in planning decisions. Paragraph 5 of the NPPF states that the document does not contain specific policies for NSIP and that applications in relation to NSIP are to be determined in accordance with the decision-making framework set out in the 2008 Act and relevant NPS, as well as any other matters that are considered both important and relevant. However, matters that can be considered to be both important and relevant to NSIP may include the NPPF and the policies within it.



5.55 Sections of the NPPF that are of particular relevance relevant to the scope of the EIA include:

- 2 - Achieving sustainable development;
- 6 - Building a strong, competitive economy;
- 11 - Making effective use of land;
- 12 - Achieving well designed places;
- 14 – Meeting the challenge of climate change, flooding and coastal change;
- 15 – Conserving and enhancing the natural environment; and
- 16 - Conserving and enhancing the historic environment.

#### **Local Planning Policy**

5.56 The Site lies entirely within the administrative area of North Lincolnshire Council. The statutory development plan for the area currently comprises the following documents:

- North Lincolnshire Core Strategy (North Lincolnshire Council, 2011a) - adopted June 2011;
- Employment and Land Allocations (North Lincolnshire Council, 2017) - adopted March 2016; and
- Saved Policies of North Lincolnshire Local Plan (Local Development Frameworks Government Office for Yorkshire and The Humber, 2007) - adopted May 2003, saved September 2007.

5.57 It is considered that these documents may be ‘important and relevant’ as defined by EN-1 (DECC, 2011a). The following policies are considered relevant to the Proposed Development:

#### Core Strategy (2011)

- CS2 - Delivering More Sustainable Development;
- CS5 - Delivering Quality Design in North Lincolnshire;
- CS11 - Provision and Distribution of Employment Land;
- CS16 - North Lincolnshire’s Landscape, Greenspace and Waterscape;
- CS17 – Biodiversity;
- CS18 - Sustainable Resource Use and Climate Change;
- CS19 - Flood Risk;
- CS20 - Sustainable Waste Management; and
- CS25 - Promoting Sustainable Transport;

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Local Plan (2003)

5.58 The following saved policies are considered relevant from the Local Plan:

- IN10 – Wharves;
- RD1 – Development involving High Quality Agricultural Land;
- RD2 - Development in the Open Countryside;
- T1 – Location of Development;
- T2 – Access to Development;
- T5 - Green Travel Plans;
- T6 - Pedestrian Routes and Footpaths;
- T8 - Cyclists and Development;
- T14 - The North Lincolnshire Strategic Road Network (NLSRN);
- T19 - Car Parking Provision and Standards;
- T23 - Water Freight;
- C1 - Special Protection Areas, Special Areas of Conservation and Ramsar Sites;
- LC2 - Sites of Special Scientific Interest and National Nature Reserves;
- LC7 - Landscape Protection;
- LC12 - Protection of Trees, Woodland and Hedgerows;
- HE5 – Development affecting Listed Buildings;
- HE9 – Archaeological Evaluation;
- DS1 – General Requirements;
- DS7 - Contaminated Land;
- DS10 - New Hazardous Installations and Pipelines;
- DS11 - Polluting Activities;
- DS12 - Light Pollution;
- DS13 – Groundwater Protection and Land Drainage;
- DS14 - Foul Sewage and Surface Water Drainage;
- DS15 - Water Resources;
- DS16 - Flood Risk; and
- DS17 - Overhead Power Lines and High-Powered Electrical Installations.

5.59 To the south of the Proposed Development Site is the Stainforth and Keadby Canal. The lock at the junction of the canal and the River Trent are grade II listed and are designated by North Lincolnshire Council as a heritage asset in their adopted Local Plan. The lock is

located approximately 200m to the south of the 'Water Connection Corridor' of the Proposed Site.

- 5.60 The River Trent, immediately to the east of the Site is part of the designated RAMSAR, SSSI and SAC for the Humber Estuary.
- 5.61 The Stainforth and Keadby Canal is designated as a Local Wildlife Site.
- 5.62 The Site is predominantly within the open countryside, albeit the proposed 'Water Connection Corridor' is adjacent to Keadby Development Boundary. The 'Potential Discharge Option' partially runs through the Keadby Development Boundary.

#### Emerging Policy

- 5.63 North Lincolnshire Council is preparing a new Local Plan to 2036. Once agreed (formally adopted), it will replace the current North Lincolnshire Local Plan, the Core Strategy and the Housing and Employment Land Allocations Development Plan Documents (DPD).
- 5.64 The Council undertook their Regulation 18 'Preferred Options' between February and March 2020.

#### Summary

- 5.65 The energy NPS and the Marine Policy Statement (HM Government, Northern Ireland Executive, Scottish Government, Welsh Assembly Government, 2011) represent the principal policy documents against which applications for NSIP are determined. They set out a number of generic impacts and considerations relevant to the scoping of projects, and assessment principles with which applications for NSIP are expected to comply. They are therefore the main planning policy used to scope the EIA.
- 5.66 NPS EN-1 (DECC, 2011a) also sets out the government's need case for new energy NSIP. A range of evidence from the National Infrastructure Plan (HM Treasury, 2014), the Clean Growth Strategy, 'Clean Growth - The UK Carbon Capture Usage and Storage deployment pathway - An Action Plan' (Department for Business, Energy & Industrial Strategy, 2017), 'Net Zero – Opportunities for the Power Sector' (National Infrastructure Commission), and the Climate Change Act 2008 (2050 Target Amendment) Order, as outlined above, demonstrates the continued relevance and urgency of the need case set out in NPS EN-1. NPS EN-2 (DECC, 2011b) does not prescribe locations for this type of energy NSIP but establishes criteria by which developers should identify suitable sites. This evidence also demonstrates clear support for hydrogen turbine based power generation and CCUS clustering, to realise a range of aims that are consistent with the NPS.
- 5.67 For these reasons, the Applicant considers that there is a clear and compelling national need for the Proposed Development. The Applicant therefore proposes to submit an application for a DCO for the Proposed Development, and has selected a Site for relevant environmental, technical and commercial reasons.

5.68 A range of national and local policy and guidance is also likely to be important and relevant to the determination of the application and has been considered as part of scoping the EIA.

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## 6.0 POTENTIALLY SIGNIFICANT ENVIRONMENTAL ISSUES

6.1 The following sections present a discussion of the potential environmental impacts associated with the Proposed Development that it is proposed will be considered as part of the EIA. The methodology and assessment criteria that will be used to assess the potential significance of the identified impacts are also outlined, alongside potential mitigation measures for implementation following assessment.

### Air Quality

#### Baseline Conditions

- 6.2 The Environment Act 1995 requires local authorities to review air quality within their district or borough in order to determine where pollutant levels identified in the Air Quality Framework Directive may be in excess of the standards.
- 6.3 If pollutant levels in an area are likely to exceed statutory objectives, then local authorities must declare an Air Quality Management Area and draft an Action Plan to achieve the statutory objectives. The Department of Environment, Food and Rural Affairs (Defra) has issued technical guidance to local authorities to assist in undertaking this task.
- 6.4 North Lincolnshire Council monitors a number of pollutants within their administrative area, with a focus on those areas near to existing industrial sites in Scunthorpe, Killingholme and Immingham. Published reports (NLDC, 2018) indicate that annual mean concentrations of all pollutants remain well below their respective limit values, with the exception of Polyaromatic Hydrocarbons (PAH). Short term concentrations of particulate matter less than 10 microns (PM<sub>10</sub>) are reported to be above the limit value for the 24 hour mean concentrations. Short term concentrations of all other pollutants are reported to be below their respective national limit values.
- 6.5 North Lincolnshire Council has declared an Air Quality Management Area (AQMA) within their administrative area. The AQMA is situated on the eastern side of Scunthorpe, approximately 7km from the Proposed Development Site (refer to **Figure 3D – Appendix A**). The AQMA was declared due to the exceedance of the National Air Quality Limit Value for 24 hour mean concentrations of PM<sub>10</sub>. It is of note that this location is in close proximity to the Scunthorpe steelworks. The presence of the AQMA indicates that there are areas within the local authority's administrative area where concentrations of PM<sub>10</sub> could be above the relevant National Air quality Standard.
- 6.6 Baseline, or existing, background air quality at the Site will be determined using data from nearby representative automatic monitoring stations, supplemented with published local authority air quality monitoring, Department for the Environment, Food and Rural Affairs (Defra) air quality monitoring and background air quality maps, and where appropriate, data published by the UK Air Pollution Information System (APIS) for ecological sites. Any data gathered for the purposes of the Keadby 2 section 36 consent will also be reviewed.

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- 6.7 Any additional monitoring considered necessary at roadside locations to provide information for the purpose of roads traffic model verification or at nearby sensitive ecological receptors (oxides of nitrogen and ammonia) or for amine concentrations will be agreed with stakeholders including Natural England, North Lincolnshire Council and the Environment Agency and described in the PEI Report.
- 6.8 The assessment will be undertaken in line with the relevant regulations as detailed in Section 5.2 of EN-1 (DECC, 2011a) and the guidance provided in Section 2.5 of EN-2.

#### Scope of the Assessment

- 6.9 The assessment will be undertaken in line with the relevant regulations as detailed in Section 5.2 of EN-1 (DECC, 2011a) and the guidance provided in Section 2.5 of EN-2.
- 6.10 The following potential impacts may be associated with the Proposed Development:
- emission of pollutants to air from the CCGT stack and CCP stack(s) during operation;
  - emission of pollutants to air from vehicles associated with construction, operation and decommissioning; and
  - construction dust and mobile plant exhaust emissions generated during construction and decommissioning.
- 6.11 The Proposed Development, when operational, will emit known pollutants to air, via one or more stacks. These will include the combustion products nitrogen oxides (NO<sub>2</sub>) and carbon monoxide (CO), for which Air Quality Objectives (AQS) have been set as part of the National Air Quality Strategy, as well as CO<sub>2</sub> and potentially additional trace pollutants. Amines and amine degradation products may be released from the CCP. The CCGT will be designed to comply with the requirements of the Industrial Emissions Directive (IED) (European Commission, 2010), the Large Combustion Plant Best Available Techniques (BAT) Reference document (2017) and BAT Conclusions (2017), and in line with Environment Agency guidance. Emissions from the CPP will be controlled in accordance with the use of BAT recognising that currently there is no formal published Environment Agency guidance on BAT for post combustion carbon capture plants.
- 6.12 The potential for the use of SCR and the use of absorption solvent to be used within the capture plant may also result in small emissions of ammonia ('ammonia slip') and/ or amines and amine degradation products. These pollutants will be assessed for potential human health and habitats effects, recognising the nitrogen deposition potential of ammonia and also the lessons learned from the previous carbon capture projects in England and Scotland. Environmental Assessment Levels will be used to assess the potential impact of amine and amine degradation product emissions to atmosphere.
- 6.13 An atmospheric impact assessment will be undertaken for the main point source emissions, utilising air dispersion modelling to assess the impact to air quality potentially brought about through the generation and dispersion of emissions from the Proposed Development. The study will be desk-based and will assess the predicted concentrations

of emitted combustion pollutants that are potentially hazardous to human health and designated habitats sites, at identified receptors (such as residential homes, schools, designated nature sites) within the study area, as well as the potential effect on the nearby AQMA.

- 6.14 Potential impacts on ecological receptors will be assessed, including statutory designated habitat sites within 15km of the Proposed Development emission stacks, and non-statutory habitat sites within 2km of the Proposed Development emission stacks, in line with EA guidance. A 2km study area will be used to predict impacts at human health receptors.
- 6.15 The modelling will be based on Emission Limit Values (ELV) set by the IED, the BAT Achievable Emission Levels or plant performance guarantees as appropriate and with the plant at full operating load, thereby presenting a worst-case scenario in the ES. Should it be deemed appropriate to model lower loads, justification for this will be provided and the load clearly stated in the assessment. The modelling and assessment will be undertaken with regard to published government and non-governmental guidance, as appropriate.
- 6.16 The atmospheric dispersion modelling study of operational emissions will be undertaken using the Atmospheric Dispersion Modelling System (ADMS) model, currently version 5.2. ADMS is widely used by industry and the regulatory authorities.
- 6.17 The dispersion modelling study will be used to determine the most appropriate height for the CCGT stacks and the CCP stacks based on the resultant maximum short term and long term ground level concentrations predicted. There are no proposed black-start or peaking plant within the Proposed Development, however the Proposed Development will include a number of back-up generators. These generators are expected to be used in emergency situations and are anticipated to be operated for less than 50 hours per year for testing. The emissions from such plant will not be modelled if, as expected, the Environment Agency Standard Rules Permit conditions (SR2018 No.7) can be complied with i.e. a minimum stack height of 3m and located > 500m from a Natura 2000 site (the closest relevant Site located at the River Trent is approximately 1.4km from the Main Site). Where auxiliary boilers are proposed, these will be assessed, as appropriate.
- 6.18 The Proposed Development would introduce additional vehicle movements in the study area that require screening to determine the potential for impacts on local air quality. The Institute of Air Quality Management (IAQM) guidance (IAQM, 2017) sets out indicative criteria to trigger the initiation of an assessment of air quality of a proposed development, including changes in traffic flows measured using Annual Average Daily Traffic (AADT) flows. The criteria vary, dependent on whether or not the site is located within or may have an impact upon an AQMA. The Design Manual for Roads and Bridges (DMRB) criteria (Highways England, 2019), indicates that 'the impact of construction activities on vehicle movements shall be assessed where construction activities are programmed to last for more than 2 years'. These criteria, together with other relevant criteria, would be considered and agreed with North Lincolnshire Council, for the purposes of the assessment.

- 6.19 Should modelling be required, the assessment would utilise local traffic data attained during the proposed traffic and transport assessment (see the Traffic and Transport section below), including worst-case peak traffic numbers, fleet composition, and average vehicle speeds, to calculate emission fluxes for the above listed pollutants from each road source. The worst-case traffic scenarios would be modelled using designated heavy goods vehicle (HGV) routes, both with and without the Proposed Development and with specific reference to the AQMA.
- 6.20 In addition, potential impacts and nuisance from site clearance, construction dust and mobile plant exhaust emissions generated during the construction phase of the plant and any associated pipeline will be considered using a screening assessment (IAQM, 2017), and will outline examples of mitigation as good site practice and industry standards in use to control fugitive emissions during construction activities.
- 6.21 For the purposes of assessing impacts related to decommissioning, details such as the demolition methodology and changes in traffic flows are not known at this time. However, it is expected that similar mitigation measures to those proposed for construction will be required and set out in the ES. A quantitative assessment of emissions relating to decommissioning of the Proposed Development is not proposed within the scope of the ES.
- 6.22 Given that the environmental assessment proposes assessment against criteria that have been established for the protection of human health (e.g. air quality standards), no specific human health impact assessment is proposed for the EIA. Refer to the section 'Population and Health' which describes the signposting appendix that will be provided to summarise the results of the assessment of environmental aspects, including air quality, relating to population and human health.

## **Noise and Vibration**

### Baseline Conditions

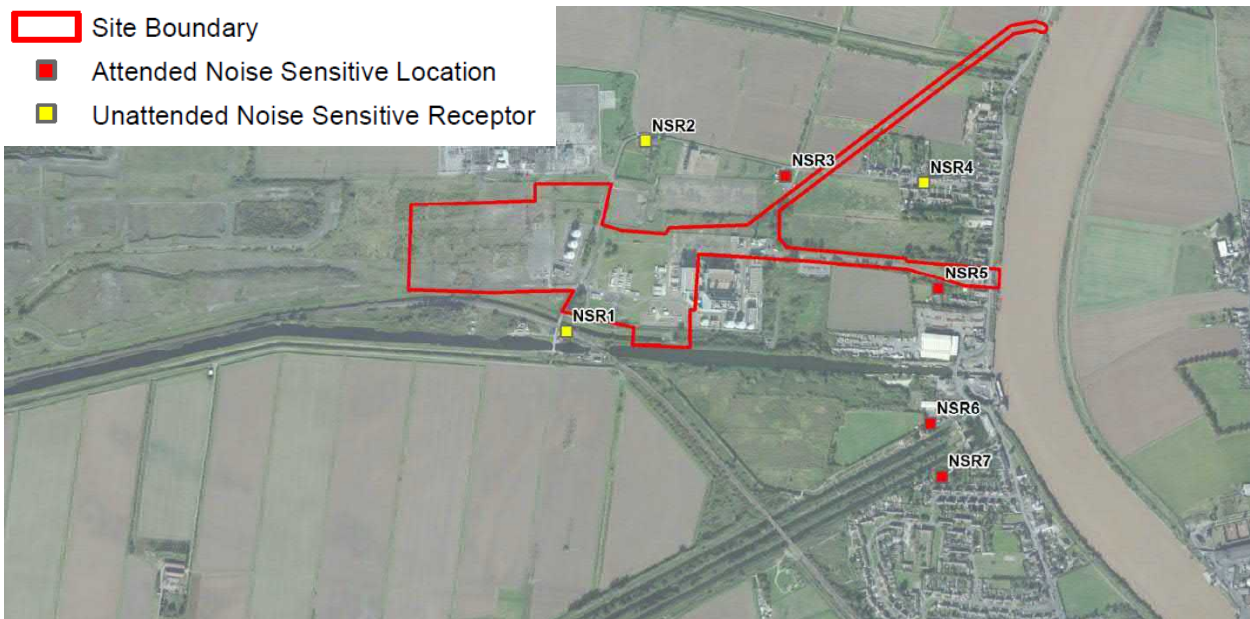
- 6.23 The Proposed Development will be located within and in the vicinity of existing industrial facilities, including Keadby 1 Power Station, the 400kV National Grid substation and the operational Keadby Windfarm. Other sources of noise likely to affect the existing climate include the construction of Keadby 2 Power Station which is ongoing throughout 2020. There are residential receptors and potentially sensitive ecological sites which have to potential to be impacted by noise and vibration emissions from the construction and operation of the Proposed Development and its proposed utility connection corridors.
- 6.24 The nearest residential settlements to the Main Site are the villages of Keadby and Althorp (300m and 1.6km to the north-east and south-east respectively) and there are also some isolated properties along Chapel Lane 250m to the north, at Vazon Bridge, approximately 20m to the south. Other isolated properties are identified in paragraph 2.10.
- 6.25 It is noted that for the purposes of EIA for the Keadby 2 Section 36 consent, a baseline noise survey was undertaken, consisting of a series of continuous unattended noise



measurements and operator attended noise measurements within the vicinity of Keadby Power Station, during the period June - August 2015. Seven noise sensitive receptors (NSR) were discussed and agreed with North Lincolnshire council representing all the receivers that could be affected by noise from the Keadby 2 development site. The NSR agreed were as follows, as shown on Plate 2:

- NSR1 - Vazon Bridge;
- NSR2 - Red House (now demolished);
- NSR3 - Hawthorne House;
- NSR4 - Keadby Village;
- NSR5 - Mariners Arms;
- NSR6 - Trent Side; and
- NSR7 - South Bank.

**Plate 2 – Representative NSR selected for Keadby 2 Project**



Source: SSE, Keadby 2 Power Station [<https://sse.com/media/389561/Chapter-8-Noise-Keadby-II-ES-Final.pdf>]

**Plate 3 – Summary of Representative Sound Levels at NSR for the Keadby 2 Project**

**Summary of Representative Sound Levels at NSRs Summer 2015/ Winter 2016**

NSR	Daytime		Night-time	
	L <sub>90</sub> , 15 minutes dB	L <sub>eq</sub> , 15 minutes dB	L <sub>90</sub> , 15 minutes dB	L <sub>eq</sub> , 15 minutes dB
1 Vazon Bridge	37/ 39	59/ 58	36/ 38	39/ 39 periods without trains 59/ 60 periods with trains
2 Red House	37/ 39	45/ 45	33/ 40	36/ 41
3 Hawthorne House <sup>2</sup>	37/ 39	45/ 45	33/ 40	36/ 41
4 Keadby Village	35/ 39	45/ 44	30/ 38	36/ 41
5 Mariners Arms <sup>3</sup>	35/ 39	45/ 44	30/ 38	36/ 41
6 Trent Side <sup>3</sup>	35/ 39	45/ 44	30/ 38	36/ 41
7 South Bank <sup>3</sup>	35/ 39	45/ 44	30/ 38	36/ 41

1 – Summer 2015 Survey without Keadby I operating/ January 2016 survey with Keadby I operating.

2 – NSR2 and NSR3 interchangeable, see text.

3– as NSR4, see text.

Source: SSE, Keadby 2 Power Station [<https://sse.com/media/389561/Chapter-8-Noise-Keadby-II-ES-Final.pdf>]

6.26 The above NSR will be considered as potential NSR for the Proposed Development for those activities to be undertaken at the Main Site.

6.27 It is proposed that consultation with key stakeholders including North Lincolnshire Council will be undertaken in order to determine specific NSR and representative locations at which noise surveys will be undertaken in order to establish the baseline noise conditions within the vicinity of the Proposed Development Site.

Scope of the Assessment

6.28 The following potential impacts are likely to be associated with the Proposed Development:

- construction and decommissioning noise and vibration impacts including construction of the main power plant site, grid and gas connections and CCP;
- construction and decommissioning traffic on public roads; and
- operational noise impacts from the Proposed Development.

6.29 Taking into consideration the low volumes of operational transport movements and based upon experience of similar projects, it is considered unlikely that trip generation during the operational phase would generate significant road traffic noise and vibration effects and it is proposed that operational traffic noise and vibration effects are screened out, provided

that such operational traffic levels are below the screening criteria set within published guidance including 'Calculation of Road Traffic Noise' (Department for Transport, 1988).

6.30 Based on the distance between the Proposed Development Site boundary and the nearest receptors, significant vibration impacts associated with operational activities are considered unlikely, although they will still be considered as part of the EIA and their exclusion from detailed analysis, if appropriate, justified with explanation taking into account site information and published guidance.

6.31 The scope of the noise and vibration assessment will be:

- identification of nearest NSRs to the Proposed Development; both residential and ecological;
- liaison with local planning authorities and other stakeholders including and Natural England to agree scope and methodology of noise assessment, including any baseline noise monitoring locations and measurement protocol;
- establishment of baseline noise levels in the locality; and
- assessment of the impact of predicted noise levels at the nearest NSR from the construction, operation and decommissioning of the Proposed Development, including:
  - construction (and decommissioning) noise and vibration (including construction and decommissioning traffic on public roads); and
  - operational noise and vibration (including site traffic on public roads).

6.32 The noise and vibration assessment will be carried out in accordance with the following guidance:

- 'Noise Policy Statement for England' (Department for Food Agriculture and Rural Affairs (Defra), 2010); and
- Planning Practice Guidance for 'Noise' (Ministry of Housing, Communities and Local Government) (MHCLG), 2019c).

6.33 Additionally, reference will be made, but not be limited, to the following:

- British Standard (BS) 5228-1 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 1: Noise' (BSI, 2014a);
- BS 5228-2 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Part 2: Vibration' (BSI, 2014b);
- International Organisation for Standardisation (ISO) 9613-2: 1996 'Attenuation of sound during propagation outdoors. Part 2: General method of calculation' (ISO, 1996);
- BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound' (BSI, 2014c);

- BS 7385: 1993 'Evaluation and measurement for vibration in buildings' (BSI, 1993);
- BS 6472: 2008 'Guide to evaluation of human exposure to vibration in buildings' (BSI, 2008);
- Control of Pollution Act 1974 (as amended);
- 'Calculation of Road Traffic Noise' (Department for Transport, 1988, "CRTN"); and
- Highways Agency (2019) DMRB Volume 11 Section 3 Part 7 LA 111 (Revision 0) Noise and Vibration.

6.34 Baseline noise monitoring requirements will be agreed in advance with the local authority. The monitoring procedures will conform to BS 7445: 2003 'Description and Measurement of Environmental Noise' (BSI, 2003), and monitoring will be undertaken in close proximity to NSRs at both weekend and weekday times, ideally (subject to adequate security and access) over a minimum five day unmanned monitoring period (Thursday to Monday suggested).

6.35 Noise levels associated with enabling and construction works will be calculated (at chosen sensitive receptors) using the data and procedures given in BS 5228. The need for prediction of vibration levels will be further considered depending upon the types of activities required but specifically the effects of piling – if required – will be considered. Additionally, noise increases at sensitive receptors due to any construction traffic on public roads will be calculated according to the methods given in CRTN. The assessment of construction works will include the electrical, water and gas connections.

6.36 The operational noise impact of the Proposed Development will be predicted using computer noise modelling software, based on information on plant layout, and the operating conditions and the levels of noise generated by plant items and vehicles. The modelling software enables a detailed implementation of the proposed equipment and buildings, existing surrounding buildings and ground features. The software implements the methodology in ISO 9613-2 for the calculation of noise levels from industrial sources.

6.37 The significance of the noise impact of the Proposed Development during operation will be assessed using the method given in BS 4142 and potentially World Health Organisation (WHO) guidance (WHO, 2009). BS 4142 provides a method for rating the acceptability of increases in existing noise levels at noise-sensitive receptors affected by noise from industrial sources at proposed developments, and the WHO guidance provides information regarding assessment of sleep disturbance. Further details of the approach will be discussed and agreed as required with the local authority.

6.38 Additionally, the potential for tonal, impulsive and irregular characteristics of the noise emissions from the Proposed Development will be considered and assessed against the prevailing noise climate to the NSR.

6.39 The construction of the Proposed Development may have an impact on traffic flows on local roads around the site. The change in road traffic noise levels, at a selection of relevant receptors, will be predicted using the standard methodology outlined in the CRTN. The

predictions will be based on baseline and with-development traffic data provided as part of the proposed traffic and transport assessment (see Traffic and Transport).

- 6.40 The significance of changes in road traffic noise levels will be assessed based on a range of relevant guidance including the DMRB.
- 6.41 Criteria for determining the significance of noise and vibration impacts on relevant noise sensitive ecological receptors, including breeding birds, will be discussed and co-ordinated with the project ecology consultants.

### **Traffic and Transport**

- 6.42 This chapter will outline the proposed approach to assessing the likely significant effects of traffic associated with construction, operation and decommissioning of the Proposed Development.

#### Baseline Conditions

- 6.43 There are several potential road traffic access routes to the Proposed Development Site from the Strategic Road Network (SRN).
- 6.44 Access to the Proposed Development Site during the construction phase for HGV construction traffic could be via the existing access road from the A18 that was constructed in line with the transport conditions imposed for the consented development for Keadby 2, requiring heavy commercial traffic not to be routed through Keadby village. The location of this access is shown on **Figure 2A (Appendix A)**.
- 6.45 Alternatively, from the M18 vehicles would route via Junction 5 (J5) and eastbound to the M180 and exit at J1 to the A18 until it's junction with the B1392. Vehicles would then travel northbound along the B1392 for approximately 1km. A further alternative route to the Proposed Development Site is via the M180, where vehicles would leave the motorway at J2 towards and travel northbound along the A161 to its junction with the A18. Vehicles would then utilise the final section of the M18 route via the A18 and B1392. The fourth route to the Proposed Development Site is via the A18 Doncaster Road from either the A1077 to the south or the M181 to the south. Traffic would utilise the Fordingham Grange roundabout and take the westbound A18 exit. Vehicles would then be required to cross the River Trent via the Keadby Bridge and then perform a right turning manoeuvre at the Junction with the B1392 which would lead directly to the site access.
- 6.46 The study area will comprise these main highway links and the public transport, cycle and walking provision within the immediate vicinity of these of these links. The main characteristics of each highway link are summarised below.

#### *A18*

- 6.47 Within the study area, the A18 is a single carriageway link following an east-west/ west-east alignment between J1 of the M180 and the Fordingham Grange Roundabout to the

west of Scunthorpe. The majority of the road is subject to a National Speed Limit of 60mph and passes through rural areas to the west of Scunthorpe.

- 6.48 To the west of the River Trent, the A18 passes to the west of Althorp village where the speed limit reduces to 40mph. Immediately to the south of Keadby, a 30mph speed limit is enforced and the link becomes more suburban in nature, with footways provided alongside the northern boundary up to and crossing the Keadby Bridge. The route then passes the industrial development to the south of Gunness, following a north-south/ south-north alignment for a distance of 0.5km, where the road bends sharply at the junction with the B1216, becoming Doncaster Road. To the east of the B1216 junction, the A18 speed limit increases to 40mph for a distance of 0.5km along the frontage of the residential units along the southern boundary, which also facilitates a marked cycle lane on both sides of the road. To the east of these properties, the cycle lanes are discontinued, and the speed limit increases to 60mph on approach to the Fordingham Grange Roundabout.

#### *A161*

- 6.49 Within the study area, the A161 is a single-carriageway link following a north-south/ south-north alignment between J2 of the M180 and the A18 to the north. This section of the A161 is subject to a National Speed Limit of 60mph and is rural in nature with no footways provided on either side of the carriageway.

#### *B1392*

- 6.50 Within the study area, the B1392 is single-carriageway road that serves the village of Keadby, and the existing Keadby 1 Power station. The B1392 is suburban in nature and within the study area it is subject to a 30mph speed limit with footways provided on both sides of the carriageway. Due to the absence of Traffic Regulation Orders (TROs), on-street parking takes place intermittently along the route on both sides of the highway, particularly outside of residential properties without access to a private driveway.

#### *Cycling*

- 6.51 With the exception of the 0.5km section of marked cycle lane on the A18, there are no National Cycle Routes (NCRs) that have an interface with the highway links that form the study area.

#### *Walking*

- 6.52 As previously identified, footways are present along sections of the A18, intermittently depending on the location, and along the length of the B1392. The presence of footways determines the overall sensitivity value of the highway link.
- 6.53 Five PRoW cross or are directly accessed from the three highway links described in the preceding sub-sections. These are listed in [Error! Reference source not found.](#)<sup>4</sup> below:

**Table 3 - PRoW within the Study Area**

Public Rights of Way with Highway Interface
YPROWFOOTPATHKEAD120
YPROWFOOTPATHGUN180
YPROWFOOTPATHBELT25
YPROWFOOTPATHBELT141
YPROWFOOTPATHBELT21

6.54 The PRoW within the immediate vicinity of the Proposed Development Site are described further detail below:

- YPROWFOOTPAHKEAD10 runs north-south from Chapel Lane to a point north of Warping Drain. The southernmost point of this footpath is approximately 50m from the proposed Water Connection Corridor; and
- YPROWFOOTPAHKEAD9 runs east-west from the northern terminus of Footpath 10.

#### *Public Transport*

6.55 There is public transport provision along the A18 and B1392 with a number of bus services currently operating including the service 360/1, 90, 35, 399, 646/7. A summary of services operating from Althorpe station located immediately west of Keadby Bridge is provided below:

- services run between 6:00 – 23:15 between Monday and Friday;
- services run between 6:00 – 22:15 on Saturday;
- no services on Sunday;
- most services provided by Northern with occasional Trans-Pennine Express services;
- hourly services to Scunthorpe and Doncaster;
- one direct early morning service to Manchester Airport; and
- one direct late-night service to Cleethorpes.

#### *Rail*

6.56 To the south of the Main Site, the Scunthorpe to Doncaster passenger rail line is present; there are no existing connections or sidings into the Keadby Power Station site. There is a passenger service run by TransPennine Express every hour in each direction.

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## Water

- 6.57 The Stainforth and Keadby Canal is immediately to the south of the Main Site. At the intersection with the River Trent, Keadby Lock is present which is being used from February to September 2020 during construction of Keadby 2 Power Station to facilitate the deliveries of plant and equipment via Railway Wharf. Consideration to using the canal will be given for the delivery of plant during construction, where reasonably practicable, and an indicative waterborne transport off-loading area is included in the indicative Order Limits (**Figure 2A – Appendix A**). Owing to the potential linkage with the UK Marine Area (i.e. as an area temporarily separated from the natural course of the tide), any potential works within the canal will be considered against the relevant marine regulations as appropriate, although no works on the Lock are envisaged to be required as part of the Proposed Development.
- 6.58 As the Proposed Development may require works at the water intake that would lie within the UK Marine Area, a Marine Licence may be required. Whether this is ‘Deemed’ within the DCO or ‘standalone’, potential effects on the marine environment will be appropriately considered; this will include potential risks to other mariners.
- 6.59 The primary risks to other users at this location will likely be related to any constraints caused by in-river working affecting navigational channels. A qualitative desk-based assessment of navigational risk will be undertaken informed by stakeholder engagement, as required.

## Scope of the Transport Assessment

- 6.60 The following potential impacts may be associated with the Proposed Development:
- generation of traffic during construction (and decommissioning) affecting the local and strategic road network;
  - generation of traffic during operation affecting the local and strategic road network; and
  - generation of traffic during decommissioning affecting the local and strategic road network.
- 6.61 The volume of construction vehicles associated with the delivery of plant and the labour force has not yet been determined. However, the highest volume of HGV and traffic movements will be associated with the construction phase of the Proposed Development.
- 6.62 It is anticipated that the operational phase will result in a limited number of operational roles and deliveries. There is also the potential for increased operational transport movements associated with planned outages. However, based upon experience of similar projects, it is considered unlikely that trip generation during the operational phase would generate significant traffic and transport effects. It is proposed that the TA scope specifically excludes operational traffic assessment (refer to Section 7.0 – Non-Significant Issues) based on the assumption that operational traffic movements will be below



screening thresholds specified in published guidance. This approach would be agreed with the relevant Highways Authority via a Transport Scoping Report (refer to paragraph 6.2.1).

- 6.63 It is difficult to predict the effects of decommissioning the Proposed Development at this stage given its design life of circa 25 years. At the end of its operating life, the most likely scenario is that the Proposed Development would be shut down and all above ground structures would be removed from site. At this stage, a standalone Decommissioning Environmental Management Plan (DEMP) would be produced to consider in detail the potential environmental risks on the Site and contain guidance on how risks can be removed or mitigated. This would include details of the anticipated traffic and transport effects and how they could be mitigated. It is envisaged that decommissioning traffic movements will be comparable to, or less than those associated with construction of the Proposed Development.
- 6.64 To fully address the impacts of the construction phase on the transport network, the main document supporting underpinning the ES Chapter would be the Transport Assessment (TA). The scope of the TA will be developed (following determination of the number of construction movements) in liaison with all relevant local and strategic highway authorities.
- 6.65 The scope of the TA will cover the following key areas:
- a review of national, regional and local transport policy including the National Planning Policy Framework and Local Planning Policy Documents;
  - a description of baseline and future baseline conditions, including link and junction flows (described further above), a review of highway safety issues including examination of personal injury accident data and consideration of accessibility by all main transport modes;
  - calculation of construction traffic flows over the period of construction;
  - distribution and assignment of construction traffic flows to the road network, including the identification of routes for abnormal loads such as the delivery of generators and transformers;
  - local network impact analysis – the size of the study area is to be confirmed with the local authorities and Highways England, and key junctions may be identified by these stakeholders that require detailed capacity analysis;
  - consideration of the local PRow for leisure and commuting uses, and whether their use would be affected by the Proposed Development;
  - cumulative impact assessment – including consideration of the traffic likely to be generated by other committed and proposed Developments in the study area; and
  - the formulation of mitigation measures, such as a Construction Worker Travel Plan to promote sustainable journeys during the construction phase of the development and where possible reduce single occupant car journeys, and a Construction Traffic

Management Plan to seek to control the routing and impact that HGVs will have on the local road network during construction.

- 6.66 A summary of any residual and cumulative impacts will be provided should the proposed mitigation not fully address the impact of the Proposed Development on the transport network.

#### Scope of the ES Chapter

- 6.67 The traffic and transport chapter will summarise salient points from the TA and relate the magnitude and significance of potential impacts to criteria contained in the Institute for Environmental Management and Assessment (IEMA) 'Guidelines for the Environmental Assessment of Road Traffic' (GEART). This chapter will therefore consider the following effects:

- severance;
- driver delay;
- pedestrian delay;
- pedestrian amenity;
- highway safety;
- PRow; and
- hazardous loads.

#### **Ecology**

##### Baseline Conditions

- 6.68 Information on nature conservation designations in the vicinity of the Proposed Development has been provided in Section 2 and is not duplicated here (refer to **Figure 3A – Appendix A**).
- 6.69 The Main Site encompasses undeveloped land centred on Keadby Common. In addition, the Proposed Development Site incorporates (for the purposes of connections), the existing Keadby 1 Power Station site and associated existing cooling water intakes and outfalls; the Keadby 2 Power Station site, where construction is in progress and all vegetation has been removed, and additional land for the purposes of laydown and biodiversity management.
- 6.70 There are two areas of primary relevance for the assessment of the potential ecological impacts and effects of the Proposed Development:
- 6.71 The Main Site because:
- (a) this is where the main infrastructure would be constructed and operated;
  - (b) it coincides with habitats of potential nature conservation value; and

6.72 The Water Connection Corridors because:

- (a) the Humber Estuary SAC which encompasses the River Trent intersects with the locations of the proposed cooling water abstraction and outfall for the Proposed Development.

6.73 The Main Site overlaps with an area of land known as 'Keadby Ash Tip'. This land supports two habitats of principal importance for nature conservation in England under Section 41 of the Natural Environment and Rural Communities Act (NERC) 2006. These are lowland dry acid grassland and open mosaic habitats (OMH) on previously developed land. The Ash Tip also contains secondary semi-natural broad-leaved woodland that is also likely to be considered a habitat of principal importance.

6.74 Other semi-natural habitats present within and adjacent to the Main Site comprise arable farmland, dense scrub, broad-leaved plantation woodland and scattered trees, canals and drainage ditches, semi-improved neutral grassland and regularly mown amenity grassland. The Water Connection Corridor including works to an existing cooling water intake and outfall for the Proposed Development are located on the western bank of the River Trent. The river is tidal at this location, with narrow bands of saltmarsh and mudflat at and below the mean high-water line.

6.75 Previous surveys commissioned by the Applicant on land within and adjacent to the Main Site have recorded the following protected and notable species: water vole (*Arvicola amphibius*), badger (*Meles meles*), foraging common pipistrelle bat (*Pipistrellus pipistrellus*), other foraging bat species (but only at very low activity levels), breeding birds, grass snake (*Natrix natrix*) and notable assemblages of plants and terrestrial invertebrates associated with OMH and acid grassland. Previous surveys have not found great crested newt (*Triturus cristatus*) and all ponds within 250 m of the Proposed Development Site are unsuitable for this species as they dry up in summer.

6.76 The River Trent at the location of the cooling water intake and outfall is known to support a diverse fish assemblage, including notable species that migrate past the Proposed Development Site between the Humber Estuary and headwaters in the Trent Catchment. These latter species are European eel (*Anguilla anguilla*), river lamprey and sea lamprey. The last two migratory species are reasons for designation of the Humber Estuary SAC and Ramsar site. The Stainforth and Keadby Canal is also under consideration for potential cooling water abstraction.

6.77 The only controlled weed species currently known to occur on land within and adjacent to the Main Site are wall cotoneaster (*Cotoneaster horizontalis*) and Nuttall's waterweed (*Elodea nuttallii*). Other species may occur in locations that have not been surveyed previously.

#### [Scope of the Assessment](#)

6.78 The following potential impacts may be associated with the Proposed Development:

- permanent loss of habitats within the Proposed Development Site during construction;
- temporary impacts on habitats within the Proposed Development Site during construction;
- disturbance of habitats and protected species (including noise, dust and light impacts) in the vicinity of the Proposed Development Site during construction, operation and decommissioning;
- temporary and permanent impacts on aquatic habitats and water quality in the River Trent and potentially Stainforth and Keadby Canal, if an abstraction from this source is proposed, due to construction works at, and subsequent operation of, the cooling water intake and outfall; and
- air quality and lighting impacts on ecological receptors in the vicinity of, or downwind of, the Proposed Development Site during operation.

6.79 Potential impacts on relevant ecological features will be assessed in accordance with good practice including Guidelines for Ecological Impact Assessment in the UK and Ireland (Chartered Institute of Ecology and Environmental Management, 2019, 2019). This will also include assessment of conflicts and compliance with relevant legislation and policy. Any requirements for impact avoidance and mitigation to remove or reduce potential for significant ecological effects will be identified. Proposals for ecological enhancement will also be made.

6.80 The Proposed Development is likely to seek to utilise make-up water from the River Trent or the Stainforth and Keadby Canal with an associated discharge into the River Trent. The abstraction of water for this purpose will be considered within the ES in terms of potential effects on ecological receptors. Depending on the volumes required for the Proposed Development, there may be a risk of entrainment to species from abstraction; this depends heavily on the approach velocities involved and will be considered within the ES, as required.

6.81 An eel screen is likely to be required at the cooling water intake from the River Trent to comply with requirements of the Eels (England and Wales) Regulations 2009, as well as National Policy Statement (NPS) EN-2. As noted in Section 2, a Marine Licence would also be required for works within the River Trent; this consenting process may also lead to further environmental controls for in-river works. This will be considered further in the ES and will be informed by the requirements of EA, MMO and Natural England.

6.82 As outlined in the Air Quality and Noise and Vibration sections of this report, the Proposed Development will result in emissions to air and of noise and potentially vibration. Potential air quality impacts on relevant statutory and non-statutory nature conservation designations will be described in the Air Quality impact assessment, with additional consideration and assessment in the Ecology chapter, as appropriate. Similarly, consideration of impacts on relevant species sensitive to noise and vibration disturbance will be made, using data presented in the Noise and Vibration Chapter, with the results presented in the Ecology chapter.

6.83 A summary of the additional ecological surveys (with timescales) proposed to be undertaken to facilitate an assessment of the likely effects of the Proposed Development on designated sites, habitats and protected/ notable species and to inform the Ecological Impact Assessment for the Application, is provided in Table 4 below.

#### **Terrestrial Ecology (surveys not proposed and justification)**

6.84 Surveys for the following species have been scoped out in relation to the Main Site:

- Great crested newt – a Preliminary Ecological Appraisal (PEA) undertaken by AECOM for the applicant in 2017 covered all land relevant to determination of the potential great crested newt constraints to the Proposed Development. This work confirmed that there is no reasonable likelihood of great crested newt occurring in the zone of influence of the Proposed Development. In 2010, AECOM surveyed all ponds within the Proposed Development Site, no great crested newts were found, and all ponds were found to have dried up by July that year. In 2012 and 2015, ecologists from Jacobs undertook monitoring surveys for Keadby Wind Farm that involved surveys of ponds within the Proposed Development Site and on adjacent land. Again, the species was not found. Work completed by AECOM in 2017 did not involve surveys for great crested newt but again confirmed that all of the ponds within the Site dry up by July and are therefore that these are unsuitable to support a breeding population of great crested newt. The combined prior evidence indicates that there is no reasonable likelihood of great crested newt occurring in the zone of influence of the Proposed Development. There are also no desk study records for great crested newt in the local area.
- Bat roost surveys – the Proposed Development is not anticipated to affect existing buildings or structures that may have potential to contain bat roosts. It is also not anticipated that any trees potentially suitable for use by roosting bats will be affected. Previous surveys completed by AECOM did not find any trees of suitable age or condition for use by roosting bats within the Proposed Development Site and this will be re-confirmed during the planned PEA.
- Reptiles – the Proposed Development Site is largely unsuitable for reptiles as it is under arable farmland or is covered by existing power station infrastructure. The only cohesive area of optimal habitat for reptiles is that within Keadby Ash Tip and this was surveyed by AECOM in 2017 using standard good practice methods. This survey only recorded a single juvenile grass snake and no evidence of a site dependent reptile population was found. This snake was recorded on the western boundary of Keadby Ash Tip beyond the land required for the Proposed Development.
- Breeding birds – the Proposed Development Site is largely under arable farmland or is covered by existing power station sites. Notable species or assemblages are not likely to occur in these areas, with the bird species present typical of comparable habitats in the wider landscape. Previous surveys by AECOM in 2017, and for the Keadby 2 Power Station Environmental Statement in 2015, collected breeding bird data for high quality habitats within and adjacent to the Proposed Development Site.

These data are sufficiently current to be suitable to inform the impact assessment for the Proposed Development, given the habitats present remain comparable. Further survey is therefore not considered necessary or proportionate given the prevailing habitat context over most of the Proposed Development Site.

- Wintering and passage birds – the Proposed Development Site comprises former arable farmland, currently used as construction laydown for Keadby 2 Power Station, and an existing National Grid substation, with the majority of the remaining land area in the Keadby 1 and 2 Power Station sites. These habitats are unlikely to be of importance for notable wintering and passage bird species or assemblages. Land within Keadby Ash Tip is not considered to be of specific value for wintering and passage birds given the prevailing habitats present are OMH, acid grassland, and dense secondary woodland and scrub. For these reasons, it is also considered that robust assessment of the potential impacts and effects on the Humber Estuary SPA can be made without a need for wintering and passage bird survey.
- Terrestrial invertebrate survey – the potential value of acid grassland and OMH for terrestrial invertebrates is acknowledged, but detailed specialist surveys of these habitats within the Proposed Development Site have previously been undertaken by AECOM in 2017. These detailed data are sufficiently current to inform the impact assessment for the Proposed Development, without a need to undertake further surveys.

**Table 4 – Proposed ecological desk-based assessments and surveys to inform the EclA for the Proposed Development**

Study/ Survey	Scope	Timing
Desk study	1km radius for protected species records and notable habitats, 2km for local nature conservation designations, and 15km for national and international nature conservation designations (SSSIs). This scope reflects requirements for air quality impact assessment.  Will include review and use of existing data collected for the applicant over recent years e.g. ecological investigations of Keadby Ash Tip in 2017, work for Keadby 2 Power Station in 2015, and monitoring surveys for Keadby Wind Farm from 2012 to the present	Completed Q1 2020
Phase 1 Habitat/ PEA	All habitats within the Proposed Development Site, and immediate surrounds to place site into context (to a maximum distance of 50 m out).	Completed April 2020, botanical data topped up later as appropriate
Badger	All habitats within the Proposed Development Site, and immediate surrounds to place site into context (to a maximum distance of 50m out, where accessible).	Completed April 2020
Water vole	Relevant watercourses and field drains within the Proposed Development Site, and immediate surrounds to place site into context. Watercourses will be surveyed where impacts cannot be avoided, or appropriate stand-offs achieved.	May and September 2020
Otter	Relevant watercourses and field drains within the Proposed Development Site, and immediate surrounds to place site into context. Watercourses will be surveyed where impacts cannot be avoided, or appropriate stand-offs achieved.	May and September 2020
Bat activity – combination of walked transect and static detector survey	An appropriate scope compliant with current good practice will be defined following completion of the planned PEA. The survey will encompass all relevant semi-natural habitats that would be affected by construction of the Proposed Development and other habitats within the Proposed Development Site where there is potential for adverse effects on bats e.g. from operational lighting.	May, July and September 2020
Aquatic invertebrate	All watercourses and field drains within the Proposed Development Site. Relevant watercourses will be surveyed where impacts cannot be avoided, or appropriate stand-offs achieved.	May 2020
Aquatic flora	All watercourses and field drains within the Proposed Development Site. Relevant watercourses will be surveyed where impacts cannot be avoided, or appropriate stand-offs achieved.	July 2020

Controlled weeds	All habitats within the Proposed Development Site, and immediate surrounds to place site into context (to a maximum distance of 50m out, where accessible).	May to September 2020
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### Habitats Regulation Assessment

- 6.85 Given the proximity of the Humber Estuary SPA/SAC/Ramsar site, Thorne Moor SAC, Hatfield Moor SAC and Thorne and Hatfield Moors SPA to the Proposed Development Site, a signposting report to inform a Habitats Regulations Assessment (HRA) will be undertaken and informed by the EclA. It is likely that an assessment under the Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) will be required.
- 6.86 The scope of the signposting report to inform the HRA will be determined through consultation with Natural England and other key stakeholders. It is recognised that HRA is a multi-stage process and, therefore, the Applicant will continue to consult with Natural England as the HRA progresses. However, it is anticipated that all relevant information to inform the HRA will be provided by the Applicant in the EIA and will be signposted accordingly to assist the competent authority in its completion.
- 6.87 The relevant matrices from The Planning Inspectorate (PINS) Advice Note 10: Habitats Regulations Assessment (Planning Inspectorate, 2015) will be completed as required to ensure a compliant submission.

### **Water Resources and Flood Risk**

#### Baseline Conditions

- 6.88 The Proposed Development Site and a 1km study area surrounding this lies within the extensive floodplain of the River Trent. Land is generally low lying at elevations below 10m AOD and with very shallow gradients. Beyond the current Keadby Power Station site, land use is almost entirely arable farming. The study area has a complex surface water hydrology and a long history of land drainage. The Proposed Development Site and land north of the Sheffield and South Yorkshire Navigation – Stainforth and Keadby Canal is within the Isle of Axholme and North Nottinghamshire Water Level Management Board (ANNWLMB) area.

#### Groundwater and Hydrogeology

- 6.89 According to the British Geological Survey (BGS), the entire study area is underlain by bedrock of the Mercia Mudstone Group (BGS, 2020). Above this, superficial deposits consist mainly of Warp (sand and silt) with Alluvium (clay, sand, silt, and gravel) along the course and immediate margins of the River Trent.
- 6.90 According to the Multi-agency geographical information for the countryside (MAGIC) online maps, the bedrock beneath the Proposed Development Site is classed as a Secondary B aquifer (MAGIC, 2020). Secondary B aquifers are 'predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of former non-aquifers.' The superficial deposits across the Proposed Development Site are classed as a Secondary A aquifer. Secondary A aquifers are 'permeable layers capable of supporting water supplies at a local rather

than strategic scale, and in some cases forming an important source of base flow to rivers.'

- 6.91 According to the Environment Agency's online Catchment Data Explorer website, groundwater beneath the Proposed Development Site and north of the canal to the south is designated under the Water Framework Directive (WFD) as waterbody GB40402G990300 (Lower Trent Erewash - Secondary Combined) of the Humber River Basin Management Plan (RBMP) (Environment Agency, 2020). This groundwater body has a surface area of approximately 1924 km<sup>2</sup> and is currently at Poor Overall Status due to the Chemical Dependent Surface Water Body Status parameter. To the south of the canal the WFD groundwater body is the 'Idle Torne - Secondary Mudrocks' (GB40402G992200). This waterbody is a Good overall status.

#### Surface Waterbodies

- 6.92 The Proposed Development Site lies immediately west of the tidal River Trent, which flows in a northerly direction. According to the Environment Agency's online Catchment Data Explorer, the River Trent estuary forms part of the Humber Upper transitional and coastal waterbody (GB530402609203) under the Humber RBMP (Environment Agency, 2020). It is heavily modified and is currently at Moderate Potential due to angiosperms and dissolved oxygen. However, it is at Good Chemical Status.
- 6.93 Approximately 300m to the north of the Proposed Development Site, beyond Keadby Common, is Warping Drain (otherwise known as Eastoft Moor Drain). Warping Drain flows east and into the tidal River Trent via sluice gates. The drain is artificial in its character, being overwide, straight, and with flood embankments either side. Flows will also be influenced by tidal locking.
- 6.94 Warping Drain is an Ordinary Watercourse and according to the Environment Agency's online Catchment Data Explorer) it is designated under the WFD as waterbody GB104028064300 (Paupers Drain Catchment (tributary of Trent)) of the Humber RBMP. This waterbody consists of two separate watercourses, Warping Drain and Paupers Drain. approximately 13km long and drains an area of around 32km<sup>2</sup>. It is an artificial waterbody that is currently at Bad Potential due to the fish biological quality element, with ammonia and phosphates also not being good (both moderate status) (i.e. 2016 classification). However, it is at Good Chemical Status.
- 6.95 To the west of the Proposed Development Site is the Keadby Boundary Drain, which runs south to north and appears to flow into Warping Drain, although this remains to be confirmed. Keadby Boundary Drain is an Ordinary Watercourse but is not designated as a waterbody in its own right under the WFD, but forms part of the catchment of waterbody GB104028064300 (Paupers Drain Catchment (tributary of Trent)).
- 6.96 South of the Main Site there are a number of watercourses running east to west in parallel with each other. These include the North Soak Drain and the South Soak Drain, which flow either side of the Sheffield and South Yorkshire Navigation – Stainforth and Keadby Canal. The North and South Soak Drains flow into the Three Rivers a short

distance to the south, and this then connects with the River Trent via sluice gates. These three watercourses, plus the River Trent, are all Main Rivers where flood risk management is the responsibility of the Environment Agency.

- 6.97 The North and South Soak Drains are designated under the WFD together as artificial waterbody GB104028064350 (North Soak Drain Catchment (tributary of Torne/Three Rivers)) of the Humber RBMP). This waterbody is approximately 26km long and drains an area of around 56km<sup>2</sup>. It is currently at Moderate Potential due to not all mitigation measures being implemented, despite dissolved oxygen being at bad status (2016 classification). However, it is at Good Chemical Status.
- 6.98 Historical (2018) sediment sampling data obtained from the Marine Management Organisation (MMO) indicates that generally, contaminant levels are not of concern around the intake and outfall heads within the River Trent (Cefas; MMO, 2018). Organotins were found to be below the levels of detection whilst trace metal results suggest slightly higher cadmium, chromium, nickel, lead and zinc levels. All trace metal results are below relevant indicative thresholds for safe disposal to sea and more generally are representative of sedimentology at this location. Polyaromatic hydrocarbons (PAH) are the only substance identified as of 'potential concern' however, it is noted that concentrations have decreased since 2014 in sediment samples (1094 mg/kg in 2014 to 721-712 mg/kg in 2017). Further interpretation of sediment sampling data will be undertaken and presented in the PEI Report.
- 6.99 According to the Environment Agency's online Catchment Data Explorer the Three Rivers watercourse is also a WFD waterbody. Three Rivers is artificial waterbody GB104028064340 (Torne/Three Rivers from Mother Drain to Trent) of the Humber RBMP, and it is currently at Moderate Potential (2016 classification).
- 6.100 The Sheffield and South Yorkshire Navigation – Stainforth and Keadby Canal is linked to the River Trent via Keadby Locks. It is managed by the Canal & River Trust (CRT). The canal is also designated as an artificial waterbody under the Humber RBMP (waterbody GB70410281) and is classified as at Good Potential (2016 classification). The Scunthorpe Sea Cadets Boat Station is also located on the canal and it is possible they use a number of waterways in this area for recreational activities.

#### Designations

- 6.101 According to the MAGIC online maps, there are no Drinking Water Protected Areas, Drinking Water Safeguard Zones, or Source Protection Zones in the study area. However, the entire study area is within a Nitrate Vulnerable Zone and there are a number of different designated ecological sites within the study area.
- 6.102 Upstream (and north of) Althorpe Station, the River Trent is included within the Humber Estuary Ramsar, SAC and SSSI (refer to the 'Ecology' section). The River Ouse, into which Swinefleet Warping Drain flows, is also included in these nature conservation designations.

6.103 Approximately 1.2km to the south-west of the Proposed Development Site, south of the canal lies the Crowle Borrow Pits SSSI and the Hatfield Chase Ditches SSSI sites. There does not appear to be any direct flow pathways between these sites and the Proposed Development.

#### Flood Risk

6.104 The entire Proposed Development Site and surrounding environs (other than a small, slightly elevated area between Keadby Common in the east, Keadby Boundary Drain in the west, and the canal to the south, and around Crowle) is within the Environment Agency's indicative Flood Zone 3. Flood Zone 3 is land assessed as having a 1 in 100 or greater annual probability of river flooding (>1% Annual Exceedance Probability or AEP), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP) in any year. However, land north of the canal benefits from flood defences (embankments) along the River Trent.

6.105 A Strategic Flood Risk Assessment (SFRA) is available for this area - The North Lincolnshire and North East Lincolnshire Strategic Flood Risk Assessment (North Lincolnshire Council, 2011). Detailed information available (flood compartment 34T) indicates that whilst the Proposed Development Site is located within Flood Zone 3, tidal defences (embankments) between 6 and 6.3m AOD at the Keadby 1 / Keadby 2 location are in position to provide a 1 in 200 level of protection.

6.106 According to online surface water flood maps (GOV.UK, 2020) the Proposed Development Site is generally not at risk from surface water flooding, with only isolated areas at low and medium risk, and one small area of high risk along East Road within the existing Keadby Power Station site.

6.107 The Proposed Development Site is not considered at risk from reservoir flooding (<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>). The Sheffield and South Yorkshire Navigation – Stainforth and Keadby Canal is close to the Site, but given the flat, shallow gradients, the risk of flooding is also likely to be low.

6.108 Historical data indicates that the site is not at risk from reservoir flooding and groundwater flooding based on the geological setting of the wider area encompassed by Keadby 1 and Keadby 2 (Mott MacDonald, 1991). Based on historical assessment as part of the K2 ES (SSE, 2016), groundwater flooding is currently understood to be effectively managed via a well-developed drainage system serving Keadby 1 and Keadby 2 Power Stations.

6.109 Analysis undertaken at the Keadby 2 Power Station site in 2015 indicates potential flood risks arising from a breach of the tidal Trent within the vicinity of the Proposed Development. Historical Breach Analysis undertaken in support of Keadby 2 Power Station will be reviewed to identify further modelling requirements; this will be discussed with the Environment Agency.

6.110 Further desk based assessment, including requesting relevant data from the Environment Agency and a review of local SFRA will be undertaken as part of the Flood

Risk Assessment (FRA) and impact assessment. Further desk based assessment will also be undertaken of the water quality and water resource baseline, including data requests to the Environment Agency and local Environmental Authority, as well as site walkover surveys as required.

### Potential Impacts

- 6.111 The Proposed Development has the potential to have direct and indirect impacts on water quality and resources, flood risk, and the physical form and hydromorphology of waterbodies. Other potential sensitive uses of local water resources and waterways (e.g. navigation or recreation) could also be adversely impacted (subject to confirmation of use). Furthermore, any impacts on water quality and resources can also have secondary adverse impacts on ecological species and habitats. Such impacts may be direct (i.e. where there are well defined hydrological pathways between the Proposed Development and the receptor site) or they may be indirect (such as from changes in atmospheric deposition of nitrogen oxides emitted from the Proposed Development), which can lead to acidification and nutrient enrichment of standing waterbodies). In addition, it is also important to ensure that existing flood risks are taken into account and that the Proposed Development is designed in an appropriate way taking these risks into account so that it remains safe for its entire lifetime and does not increase flood risk elsewhere.
- 6.112 During construction, potential impacts include contamination from suspended solids or other chemical contaminants that may find their way into site runoff, infiltrate to ground, or be spilt directly into waterbodies when there are works within or adjacent to them. Any existing ground contamination, if present, could also be mobilised, although the Proposed Development Site will be appropriately investigated (see Section 3) and if remedial works are necessary, these would be undertaken prior to construction works taking place.
- 6.113 Other impacts during construction may involve physical damage to waterbodies or temporary changes to their flows and water levels (e.g. from an increase in runoff, changes to flow pathways, and construction of new pipelines or intake/discharge infrastructure). The potential impacts during decommissioning are expected to be similar in type and scale to the impacts that may occur during the construction of the Proposed Development.
- 6.114 During operation and maintenance of the Proposed Development, adverse impacts may include the effects of diffuse pollutants in surface water runoff (that may contain metals, hydrocarbons, and inert solids etc.); the risk of pollution from chemical spillages or fire on the Proposed Development Site (which may necessitate the use of fire-fighting chemicals or large volumes of water that may become contaminated); changes in flood risk and hydromorphology of waterbodies; the effects of water abstraction from, and discharges to, local watercourses; and the risk from atmospheric deposition of nitrogen oxides to sensitive waterbodies (i.e. those that are oligotrophic or have limited acid buffering potential).

### Scope of the Assessment

- 6.115 Through appropriate design and mitigation measures, flood risk to the Proposed Development and off-site, surface and foul drainage, abstractions and discharges from and to watercourses, response to spillages and emergencies, and potential impacts on the hydromorphology of waterbodies, can be effectively managed. This includes other regulatory regimes that require permits or consents to be obtained from the Environment Agency, Lead Local Flood Authority (i.e. North Lincolnshire Council) or the ANNWLMB for works close to and affecting watercourses.
- 6.116 The scope of the water resources and flood risk chapter will therefore be to consider all potential impacts to surface and groundwater bodies, which are in hydraulic connectivity with the Proposed Development Site or that could be at risk from atmospheric deposition of nitrogen oxides, during construction and during the entire life span of the Proposed Development.
- 6.117 Information from previous assessments at the Proposed Development Site, supported by an updated desk based study, will be used to confirm potential receptors and to establish the baseline. This will include available water quality monitoring data from Environment Agency. No additional water quality sampling and analysis is proposed. Data on historical pollution incidents, local abstraction and discharge consents will also be obtained and reviewed. Although local ground conditions suggest there is a low potential for private water supplies (PWS), a request will also be made to the Local Environmental Health Officer for information of any unlicensed potable abstractions. The Humber RBMP (Environment Agency, 2009) will also be utilised to establish WFD waterbody status and objectives under the WFD, and to establish measures that have been determined to be required for local waterbodies to meet good Ecological Status/Potential under the WFD and associated UK Regulations. Consultation will be undertaken with the Environment Agency, ANNWLMB, CRT and Yorkshire Water in order to obtain relevant available flood risk and water resource quality data and related information.
- 6.118 The potential impacts of the Proposed Development on the water environment will be assessed for construction, operation and maintenance and decommissioning phases of the Proposed Development. The impact assessment will be undertaken in consideration of Section 5.15 of EN-2 and Section 2.5 of EN-4 and demonstrate that appropriate measures will be put into place to avoid or minimise any adverse impacts on waterbodies (including their uses) and flood risk, and the significance of any residual effects will be presented in the ES. It will also be undertaken in consideration of the requirements within the Marine and Coastal Access Act (2009) in order to underpin the Marine Licence for any in-river works.
- 6.119 In most cases, a qualitative assessment of potential impacts on surface water, groundwater, hydromorphology and flood risk using a source-pathway-receptor approach and standard significance of effects criteria will be undertaken. The assessment of flood risk, operation surface water discharges, and abstractions and discharges may also be supported by quantitative analysis, where appropriate. The

scope of any specific assessments will be agreed with the relevant consultees at during consultation.

6.120 An FRA is required in accordance with the NPPF (Ministry of Housing, Communities and Local Government, 2019a) and NPS EN-1 (DECC, 2011a) due to the size (over 1 ha) and location of the Proposed Development (partly in Flood Zones 2, 3 and 3b). The FRA will consider risks to the Proposed Development from flooding as well as identify how, if at all, the risk of flooding will change as a result of the Proposed Development (including taking climate change into account). Where appropriate, recommendations to manage flood risks to an acceptable level will be made, considering the vulnerability of the proposed development to flooding, so that the development remains safe throughout its lifetime. This will inform the design of the Proposed Development (including finished ground and floor levels) as well as the EIA.

6.121 In relation to changes in drainage regime, the magnitude of this impact will depend on the proposed extent of hardstanding and the implication on run-off rates within the Site. This will be determined through preparation of a Drainage Strategy as part of the FRA. The significance of this impact will be assessed as part of the ES. The proposals will be designed to ensure that sufficient attenuation is provided for storage of surface water run-off, so as to minimise the potential risk of flooding.

6.122 The Proposed Development is likely to seek to utilise make-up water from the River Trent or the Stainforth and Keadby Canal with an associated discharge into the River Trent. The abstraction of water for this purpose will be considered within the ES; the current scope of the assessment will be to:

- identify and review publicly available information on existing water abstraction strategy for the Humber catchment;
- identify and review current abstraction licences (river & groundwater);
- assess potential available abstraction headroom; and
- review available plant requirements and assess potential for water supply via abstraction (including limitations).

6.123 Depending on the volumes of water abstracted for the Proposed Development, there may be a risk of entrapment to species; this is discussed in further detail within Ecology (section 6.76 – 6.77).

6.124 The potential effects arising from the Proposed Development in terms of water quality, resources and flood risk surrounding abstraction of water will be presented in further detail within the Water Resources and Flood Risk chapter of the ES. This will also be used to inform engagement with the Environment Agency and other stakeholders, as required, regarding any amendment to an existing abstraction licence or application for a new licence for the Proposed Development).

6.125 The discharge of treated effluent will be assessed, including in terms of any potential thermal uplift and chemical alteration (i.e. as a result of biofouling prevention). Based

on expected flows and pollutant loadings, this will be undertaken qualitatively; similarly, no chemical modelling is proposed.

6.126 The assessments of the potential impacts from the direct discharge of effluents and/ or cooling water will be undertaken in accordance with the Environment Agency 'Surface water pollution risk assessment for your environmental permit' (April 2018). A range of qualitative assessment and quantitative modelling will be used to support the ES where required.

6.127 A WFD assessment will be undertaken in accordance with Planning Inspectorate Advice Note 18 The Water Framework Directive (Version 1, PINS, June 2017). At this stage only a 'preliminary' WFD Assessment is proposed that will consider:

- whether the Proposed Development has the potential to cause deterioration in ecological status/potential of the waterbodies;
- whether the Proposed Development has the potential to prevent the waterbodies from meeting their objective of good ecological status/potential (i.e. prevention of the implementation of Environment Agency identified mitigation measures); and
- whether the Proposed Development has the potential to prevent or compromise WFD objectives being met in other waterbodies.

6.128 The Preliminary WFD Assessment will be based on a combination of desk study, hydrogeomorphological walkover survey. It will also be informed by existing data available for the existing Keadby Power Station (K1); this includes sedimentology and water quality data related to dredging and disposal activities for the K1 cooling water system MLA/2014/00183/2 (MMO, 2014) and more recently MLA/2017/00312 (MMO, 2017).

6.129 Components of the Proposed Development that have the potential to impact WFD status/potential or prevent improvement will be identified, with reference to guidance on exemptions, and these will be carried forward to further assessment. The need for further, more detailed assessment will be determined in consultation with the Environment Agency once these initial assessments have been completed.

6.130 Potential impacts on groundwater quality associated with any existing land contamination are considered in the Geology, Hydrology and Land Contamination section below.

## **Geology, Hydrogeology and Land Contamination**

### Baseline Conditions

6.131 For the purposes of determining the local baseline conditions with respect to geology and land contamination, a study area that extends 250m from the boundary of the Proposed Development Site will be adopted. This will be extended for hydrogeology to 1km from the Proposed Development Site. This is appropriate to assess the local



geological and hydrogeological setting, and any influence that potential contaminated land might have on the scheme or local receptors. However, the baseline conditions in terms of soil chemical quality, where available, will be based on information directly within the Proposed Development Site only.

### Summary of ground conditions

#### *Geology*

6.132 The British Geological Survey (BGS) Map Sheet 88 (Doncaster, 1:50,000 scale) and Map Sheet 79 (Goole) indicates that the Site geology comprises superficial Warp (artificially induced alluvium) over the majority of the Site. Where these are absent, alluvium is mapped to be present in the far-eastern part of the Main Site. The alluvium is associated with the River Trent. Drift deposits (25-Foot Drift of Vale of York) comprising sands, silts and clays are also anticipated beneath the alluvium. The published superficial geology is indicated to overlie the Mercia Mudstone Group. Made ground is also expected across the Proposed Development Site given the historical phases of development that have taken place.

6.133 Based on a review of selected historical BGS borehole records from the Main Site, the geology is characterised by approximately 12m to 15m of alluvium and drift deposits of clay, silt and sand, with occasional peat layers recorded at various depths between 0.45m and 1.6m thickness. These superficial deposits overlie the Mercia Mudstone Formation which shows evidence of near surface weathering, the extent to which decreases with increasing depth.

6.134 The Soilscape for England published by the National Soil Resources Institute describes the soils at the site as “Loamy and clayey soils of coastal flats with naturally high groundwater” (National Soil Resources Institute, 2015).

6.135 There are no SSSI designated specifically for their geological importance within the study area. Further consultation will be required with North Lincolnshire Council to establish if there are any designated Local Geological Sites present within the study area.

#### *Mineral Resources*

6.136 North Lincolnshire Council is the local authority responsible for minerals planning in Keadby. The adopted 2003 Local North Lincolnshire Plan does not refer to any minerals safeguarding or consultation areas in the study area. The 2003 Local North Lincolnshire Plan is due to be replaced by the North Lincolnshire Local Plan which will run to 2037. This is currently at Preferred Options Consultation stage.

#### *Hydrogeology*

6.137 Groundwater levels within the historical borehole records indicate generally shallow groundwater levels within the superficial geology of between 0.9m and 3.0m below ground level (bgl). Occasionally, deeper groundwater strikes were recorded between

5.4m and 6.9m bgl. There is insufficient information to conclude at this stage whether these levels are representative of true groundwater levels across the wider area.

6.138 The Environment Agency classifies the underlying superficial geology as Secondary A aquifer and the Mercia Mudstone as a Secondary B aquifer. The extent to which groundwater is used as a local resource is currently not known at this stage.

6.139 There are no groundwater SPZ within the study area according to the MAGIC website (MAGIC, 2020).

#### *Land Contamination*

6.140 The Proposed Development Site forms part of Keadby Power Station. This was built on the site of a former coal fired power station which was operational between 1952 and 1984. The Keadby 1 Power Station was commissioned in 1996 and comprises two gas turbines, with associated boilers and exhaust stack, a steam turbine, ancillary plant and equipment and general office buildings.

6.141 The Main Site's history as a coal-fired power station highlights a potential for land contamination to be present which may have resulted from the spillage, leakage and accumulation of hydrocarbons, process by-products and wastes into soil and/ or groundwater. Large quantities of coal/ hydrocarbons would have been stored and processed at the Site during operational period. Asbestos would have been used at the Site during the original construction and some residual impact from this, and the demolition/ reconfiguration of buildings and infrastructure historically at the site, may be present in near surface soils.

6.142 According to Groundsure's Enviro Data Viewer (<https://www.groundsure.io>, accessed 3rd March 2020) and available planning records for the site, there are eight historical landfill sites within the Proposed Development Site boundary. Available information on the landfill sites is as follows, and whilst there are similarities in names across the landfills, they are all distinct features across the Proposed Development Site:

- Keadby Power Station Landfill - located in the central part of Keadby Power Station and licensed between 1992 and 2000. This is reported to have received inert and industrial waste;
- Keadby Central Electricity Generating Board Landfill - located adjacent to the southern boundary and licensed between 1977 and 1990, but with the first recorded input to have been in 1958. This landfill is indicated to have received inert, commercial, industrial and household waste;
- Keadby Power Station Landfill - located adjacent to the southern site boundary and licensed in 1992 with the last recorded input in 1993. This landfill is indicated to have received inert, commercial and household waste;
- John Brown Engineering Landfill - located adjacent to the southern boundary in a cluster with the previous two entries and licensed between 1994 and 2000 but

with the last input recorded in 1995. This landfill is indicated to have received inert, industrial and liquid sludge waste;

- Former Keadby Power Station Landfill - operated by the Central Electricity Generating Board licensed from 1987 with no indicated surrender date. This landfill is indicated to have received inert, industrial, commercial and household waste;
- Pulverised Fuel Ash (PFA) settlement lagoon - operated by the Central Electricity Generating Board with no recorded licence details;
- Keadby Power Station John Brown Engineering Landfill - located to the west of the PFA settlement lagoon (no licence or waste details indicated); and
- Keadby Power Station Landfill - operated by the Central Electricity Generating Board with the first waste input recorded in 1958. Identified as having received inert and industrial waste.

6.143 The location of the historical landfill sites is shown on **Figure 3D – Appendix A**.

6.144 There are sensitive receptors located in proximity to the Site. This primarily includes the Humber Estuary (River Trent) which is a RAMSAR designated area, a SSSI and a SAC. Groundwater is both a receptor and a pathway for contamination which may provide a link between any contamination at the Proposed Development Site and other controlled waters receptors, including the River Trent. There are residential receptors in proximity to the Proposed Development Site and employees that work in the surrounding area, including in agricultural operations.

#### Scope of the Assessment

6.145 The following potential impacts may be associated with the Proposed Development:

- disturbance of contaminated soils and groundwater and creation of new pathways to sensitive receptors (including construction workers and controlled waters) during construction; and
- pollution of soils and controlled waters within or near the Main Site and connection corridors during operation, for example due to the accidental spillage of polluting materials (if materials are not appropriately stored at the Proposed Development in accordance with BAT under the Environmental Permit and/or an appropriate drainage system is not implemented and maintained).

6.146 A desk-based assessment (Phase 1) will be completed to identify potential contaminative uses at the Proposed Development Site. This desk-based assessment will identify the potential for land contamination and potential pathways to sensitive receptors and consider the potential for mobilisation of contaminants associated with current and historical land use in and around the Proposed Development Site.

6.147 The results of the desk-based assessment and conceptual site model will be used to assess data gaps and uncertainties and, if required develop an initial scope for site investigation, which may also be required to assess possible foundation solutions. This

phased approach to assessment is consistent with the Environment Agency's recently published revised online guidance for the management of land contamination ('Land contamination: risk management (LCRM)') and the soon to be withdrawn CLR11 'Model Procedures for the Management of Land Contamination' (Environment Agency, 2004) and BS10175:2011+A1:2013 'Investigation of Potentially Contaminated Sites – Code of Practice' (BSI, 2011). It is anticipated that the requirements for any initial intrusive investigation will be discussed and agreed in advance with the Environment Agency and North Lincolnshire Council.

- 6.148 An assessment of potential impacts on existing ground conditions will be undertaken as part of the EIA, including the potential for the Proposed Development to result in land contamination, as defined in the Part 2A of the Environment Act 1995. Consideration will also be given to potential impacts associated with the construction and operation of the Proposed Development and how these will be prevented or minimised.
- 6.149 The approach to assessing the potential impacts of the Proposed Development from, and to land contamination, will be undertaken by comparing the risk levels at baseline via the preliminary conceptual site model (developed in the Phase I desk study) and the risk levels for the construction, operation and decommissioning stages respectively, to determine the change in risk at each stage. Potential risks are determined and assessed based on the likelihood (or probability) and consequence using the principles given in the National House Building Council (NHBC) and Environment Agency report R&D66 titled 'Guidance for the Safe Development of Housing on Land Affected by Contamination'. This provides guidance on development and application of the consequence and probability matrix to risk assessment and broad definitions of consequence and is widely used for a range of development.
- 6.150 The significance of the effects of land contamination are assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction, operation and decommissioning stages. Where there is shown to be a decrease in contamination risk the Proposed Development is assessed as having a beneficial effect on the environment in the long term.
- 6.151 If geological designations or mineral designations are present, the assessment of significance considers the sensitivity or importance of the asset/ resource and the magnitude of potential impact that might occur.
- 6.152 Based on the assessment of the baseline and the identification of any potential impacts, the ES will make recommendations for mitigation measures. These may include the recommendation for an initial intrusive investigation (to address residual data gaps or better delineate identified potential contamination hotspots or plumes), quantitative risk assessment, remediation and validation. It will also make recommendations for possible mitigation measures to be employed by contractors, should any previously unidentified contamination be encountered during the construction phase.

## Landscape and Visual Amenity

### Baseline Conditions

6.153 The Site lies within the Humberland Levels National Character Area (NCA) which is a flat, low-lying and large-scale agricultural landscape (Natural England, 2014). There is widespread evidence of drainage history, in particular from the 17th century, in the evidence of ditches, dykes and canalised rivers. The flat landscape enables extensive, unbroken views where vertical structures including power stations and wind turbines, are very prominent.

6.154 The Site lies within the Trent Levels Landscape Character Area (LCA) within the North Lincolnshire Landscape Character Assessment and Guidelines (Estell Warren Landscape Architects, 1999). This LCA is characterised as a flat, open floodplain landscape with long distance views with little diversity in character.

6.155 Sensitive visual receptors are located within nearby settlements including Keadby, Althorpe and Gunness and local PRoW including the National Trail along the River Trent.

### Scope of the Assessment

6.156 The following potential impacts may be associated with the Proposed Development:

- temporary changes to landscape character and views from sensitive receptors in the vicinity of the Proposed Development Site during construction and decommissioning; and
- permanent changes to landscape character and views from sensitive receptors in the vicinity of the Main Site and AGI during operation.

6.157 The proposed method of landscape and visual impact assessment has been devised to address the specific impacts likely to result from a development of its scale and nature. The methodology draws upon the following established best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment, Third Edition. (IEMA; Landscape Institute 2013); and
- Visual representation of development proposals. Technical Guidance Note 06/19 (Landscape Institute, 2019).

6.158 The EIA process requires that a clear distinction is drawn between landscape and visual impacts, as follows:

- landscape impacts relate to the degree of change to physical characteristics or components of the landscape, which together form the character of that landscape, e.g. landform, vegetation and buildings; and
- visual impacts relate to the degree of change to an individual receptor's view of that landscape, e.g. local residents, users of public footpaths or motorists passing through the area.

6.159 The assessment of impacts on built heritage, including impacts on the setting of listed buildings and structures, will be addressed by the cultural heritage assessment – see the Cultural Heritage section above.

6.160 A detailed study of the existing landscape components, character and views of the Proposed Development Site and an identified study area will be carried out in consideration of the following:

- site context;
- topography;
- vegetation including green infrastructure;
- roads, public rights of way and access;
- settlement and land-use;
- landscape character; and
- representative views.

6.161 This will be supported by figures, annotated viewpoint photographs, wireframes and photomontages and as appropriate. The planning context with respect to landscape character and visual amenity will also be reviewed, taking into account relevant national, regional and local planning policies. The baseline study will form the basis of the assessment of the predicted impacts of the Proposed Development.

6.162 From the initial site visit and planning policy context review and based on a stack height of circa 90m, a 10km radius study area is proposed for the landscape and visual impact assessment of the Proposed Development. It is not considered that any significant landscape or visual impacts would occur beyond 10km.

6.163 Up to ten representative views will be identified within the zone of theoretical visibility (ZTV) for the main building envelope and the potential stacks, as well as around the AGI for the gas connection. The ZTV will be generated using a bare ground Digital Terrain Model (DTM) and be reviewed in the field against the following criteria in order to determine the selection of representative views which form the basis of the visual assessment:

- receptor function/ activity;
- distance from the site;
- topography and elevation;
- degree and period of exposure;
- designation of the viewing place; and
- distribution of receptors.

6.164 Up to four accurate Visual Representations of the Proposed Development for agreed representative views (visual receptors) will be produced in line with the guidance within

the Landscape Institute Technical Guidance Note 02/17 Visual representation of development proposals (Landscape Institute, 2019).

6.165 The location of representative views and photomontages will be agreed in consultation with North Lincolnshire Council and other consultees, as appropriate.

6.166 The mitigation of landscape and visual effects will be intrinsic within the Proposed Development which will adopt design principles and standard construction or operational measures including:

- seeking to substantially retain and manage existing established vegetation within the Proposed Development Site, as far as reasonably practicable, to ensure its continued presence to aid the screening of low level views into the Site;
- use of suitable materials in the construction of structures to reduce reflection and glare and to assist with breaking up the massing of the buildings and structures;
- selection of finishes for the buildings and other infrastructure would be informed by the finishes of the adjacent developments and agreed with relevant consultees at the detailed design stage in order to minimise the visual impact of the Proposed Development; and
- lighting required during the construction and operation stages of the Proposed Development would be designed to reduce unnecessary light spill outside of the Site boundary, in accordance with a lighting strategy that will accompany the Application for development consent.

6.167 A landscaping strategy, incorporating (but not limited to) these measures, will be submitted as part of the Application for development consent.

6.168 As described in Section 3.0, a number of technical parameters have yet to be finalised for the Proposed Development, in order to maintain flexibility as the design progresses. Therefore, the Rochdale Envelope approach will be applied to the assessment and a worst-case scenario assessed that allows for later choice of technology, dimensions and configuration of any buildings. The likely worst-case for assessment will be reported in the PEI Report.

6.169 Where the assessment indicates the need for mitigation as a result of significant effects on landscape character or visual amenity, these will be outlined within the ES. A detailed landscaping and biodiversity management strategy will be prepared to accompany the Application.

## **Cultural Heritage**

### Baseline Conditions

6.170 There are no World Heritage Sites, scheduled monuments, Grade I or II\* listed buildings, conservation areas, registered parks and gardens, registered battlefields or protected wreck sites within the Proposed Development Site.

- 6.171 There are a number of non-designated heritage assets recorded in the North Lincolnshire HER within the Proposed Development Site. Within the Main Site area these include the site of a former farmstead, demolished in the 19th century (HER 25874), and a purported Romano-British settlement site, known from fieldwalking, south of Trent Road (HER 17311). The Water Connection Corridor lies on the alignment of a post-medieval land improvement drain (HER 24691).
- 6.172 Archaeological monitoring undertaken during construction of a fuel pipeline route across the Keadby Pumping Station area, immediately south-east of the Main Site area, recorded no significant archaeological remains (NMR 1914639). Deer antlers were uncovered in peat of probable Bronze Age date during construction of the former Keadby Power Station in 1951 (HER 15717), and there is a record of a mid-18th century discovery of a late-Roman bog body in the vicinity of the site (HER 71). These latter finds are suggestive of favourable conditions for the survival of organic material in the vicinity of the Main Site. Geophysical survey undertaken at the purported Romano-British settlement site (HER 17311), within the Main Site area, reflected a pattern of sediment deposition from river flooding and/or warping<sup>1</sup>.
- 6.173 Outside the Proposed Development Site boundary, the closest assets are the scheduled monument and grade II listed building at Keadby Lock on the Stainforth and Keadby Canal (NHLE 1005204; 1342734), located approximately 160m south of the Main Site area.
- 6.174 The surrounding landscape contains notable concentrations of listed buildings in Althorpe (including Grade I listed Church of St Oswald NHLE 1083258), Crowle (also a conservation area and including Grade I listed Church of St Oswald NHLE 1346672) and Eastoft. There are isolated and smaller groupings of listed buildings in the surrounding landscape. One further scheduled monument lies within 5km of the Main Site area at Flixborough Saxon Nunnery and Site of All Saints Medieval Church and Burial Ground (NHLE 1009382).
- 6.175 There are no World Heritage Sites, conservation areas, registered parks and gardens, registered battlefields or protected wreck sites are located in the surrounding area. The non-designated Isle of Axholme area of Special Historic Landscape Interest (saved policy LC14 of the North Lincolnshire Local Plan lies 2km south of the Main Site.
- 6.176 **Figure 3B (Appendix A)** illustrates the location of designated heritage assets within 1km, 3km and 5km of the Proposed Development Site.

#### [Scope of the Assessment](#)

- 6.177 The following potential impacts may be associated with the Proposed Development:

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<sup>1</sup> Warping is a land improvement practice of intentionally letting river water flood agricultural land, so that its suspended sediment settles on the land before the water is released back into the river.



- physical impacts and/ or impacts caused by change to the setting of designated and non-designated heritage assets, including archaeological sites and historic landscape character areas, within the Proposed Development Site during construction; and
- impacts caused by change to the setting of designated and non-designated heritage assets, including listed buildings, conservation areas and historic landscape character areas, in the vicinity of the Proposed Development Site during construction and operation.

6.178A desk-based cultural heritage assessment will determine, as far as is reasonably possible from existing records and visits to relevant archives and local studies libraries, the nature of the archaeological resource within a study area of 1km from the Proposed Development Site boundary for non-designated heritage assets. Formal HER searches at North Lincolnshire HER will be carried out. A larger study area of 3km, will be used to identify designated heritage assets and the results will be used to identify any impacts that the Proposed Development may have on the receptors due to change to their settings. An extended study area of 5km will be used to identify those assets of the highest significance (e.g. World Heritage Sites, scheduled monuments, grade I and II\* listed buildings, conservation areas containing highly significant buildings).

6.179A Zone of Theoretical Visibility (ZTV) (to be undertaken as part of the landscape and visual impact assessment as discussed in the Landscape and Visual Amenity section) will also be used as a tool of assessment to identify areas of visibility for the setting assessment. However, as the setting of a heritage asset is not a solely visual concept, other aspects such as aural intrusion, experience, and historical associations must also be taken into account. The assessment will follow current professional good practice and guidance including that produced by the Chartered Institute for Archaeologists (CIfA) and Historic England (HE):

- CIfA Standard and Guidance for historic environment desk-based assessment (CIfA, 2014a);
- CIfA Code of Conduct (CIfA, 2014b);
- Historic England Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment (Historic England, 2015); and
- Historic England Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (Historic England, 2017).

6.180 Each of the study area boundaries defined above can be altered if deemed necessary to assess the effects of the Proposed Development in a proportionate manner. For instance, in the case of the 1km study area for non-designated assets, it is known that the site lies within 2km of the Isle of Axholme area of Special Historic Landscape Interest (saved policy LC14 of the North Lincolnshire Local Plan). Whilst this asset is non-designated, its significance may warrant an extension to the 1km study area to assess any potential impacts arising from change to its setting as a result of the Proposed Development. Conversely, due to the nature of the Proposed Development, the 3km

and 5km study areas will only be applied to the Main Site and Water Connection Corridors.

6.181 An inventory of all heritage assets will be cross-referenced to figures and the report narrative. This baseline collation of data will be supported by site visits to identify the potential for any unknown archaeological assets, the potential for survival of archaeology and to establish the setting of identified heritage assets.

6.182 It is expected that sufficient heritage information is presently available to provide an adequate baseline assessment for the EIA. Further archaeological evaluation such as geophysical survey is not anticipated, but this will be discussed and agreed with North Lincolnshire Council archaeological officers.

6.183 The purpose of the EIA will be to assess the potential impacts of the Proposed Development upon the significance of the heritage resource and to understand the level of harm to that resource. The aim will then be to propose appropriate mitigation to resolve the harm caused, where possible.

6.184 Once all of the potential heritage receptors have been identified, they will be assigned a 'value'. This is not solely a reflection of their designated or non-designated status but is determined through a number of factors including their values which can be expressed as artistic, archaeological, architectural or historic. The impact from the Proposed Development upon the significance of the heritage assets will then be quantified and expressed within the EIA. This will produce an initial significance of effect of the Proposed Development upon the heritage resource, taking into account any design or embedded mitigation

6.185 Following the impact assessment process, any potential mitigation strategies required will be considered and recommendations made. The significance of residual effects remaining after mitigation will be assessed.

## **Socio-Economics**

### Baseline Conditions

6.186 The Main Site is located adjacent to the existing and under construction Keadby Power Stations (Keadby 1 and Keadby 2) in the North Lincolnshire Council area. North Lincolnshire Council's Local Plan – Preferred Options document (February 2020) includes some focus on low carbon energy. The Local Plan states, "appropriate provision for the use of renewable and low carbon energy will be made," indicating low carbon energy from the Proposed Development is in line with the Local Plan.

6.187 North Lincolnshire Council launched an Economic Growth Plan in November 2018, setting out plans to create 4,000 new jobs and growing the local economy by North Lincolnshire's economy by £721 million. It outlines the local 'energy corridor' in North Lincolnshire, which Keadby Power Station site is located in. Having a 'stable and transparent strategy on renewable energy' is highlighted as an area to support the

economic growth of in North Lincolnshire, something that the Proposed Development can be a central part of.

### Scope of the Assessment

6.188 The following potential impacts may be associated with the Proposed Development:

- impact on land use, employment and agriculture;
- creation of direct and indirect employment during construction, operation and decommissioning.

6.189 Potential traffic, noise, air quality/ dust and visual impacts on local residents and other sensitive receptors will be assessed as part of the Traffic and Transport, Noise and Vibration, Air Quality, and Landscape and Visual Amenity assessments described in other parts of this Report.

6.190 The methodology for assessing land use, agriculture and socio-economic impacts will follow standard EIA guidance and will involve:

- review of relevant baseline conditions at the Proposed Development Site and locality;
- assessment of socio-economic policy justification for the Proposed Development and the contribution of these activities to North Lincolnshire Council's socio-economic policy objectives;
- estimate of employment generated during the construction, operational and decommissioning phases;
- assessment of the impact of the Proposed Development on agricultural land and businesses, and PRowS, that may be affected by the Proposed Development;
- consideration will also be given to whether there are any impacts that are not assessed in other ES chapters (Traffic and Transport, Noise and Vibration, Air Quality, and Landscape and Visual Amenity) that might affect recreational activities and land use in the immediate surroundings of the Main Site; and
- assessment of the likely scale, permanence and significance of effects.

6.191 The social and economic policy context review will consider relevant policy at various levels including: local, regional and national (in terms of urban regeneration and neighbourhood renewal). The assessment will be carried out using a number of recognised data sources including, but not limited to the following:

- Office of National Statistics Labour Force and Neighbourhood Statistics;
- Business Register and Employment Survey;
- Annual Population Survey;
- Census 2011; and
- Travel to Work Data.

6.192 Wherever possible the impacts of the socio-economic assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes and Communities Agency (HCA). Where no standards exist, professional experience and judgement will be applied and justified.

6.193 A summary will be provided of key residual impacts of the Proposed Development and how the Proposed Development fits into local and regional socio-economic objectives, as well as its overall impact on the contribution to the local economy and community.

## Climate

### Baseline Conditions

6.194 The baseline conditions for the climate assessment – specifically, a greenhouse gas (GHG) impact assessment - will be a business-as-usual scenario whereby the Proposed Development does not proceed, for those lifecycle stages scoped into the assessment.

### Scope of the Assessment

6.195 To align with the requirements of the EIA Regulations 2017 and associated published guidance, three separate aspects have been considered in scoping the climate assessment:

- lifecycle greenhouse gas (GHG) impact assessment: The effect on climate change of GHG emissions arising from the Proposed Development, including how the project will affect the ability of UK Government to meet reduction targets within its carbon budgets;
- in-combination climate change impact (ICCI) assessment: The combined impact of the Proposed Development and potential climate change on receptors in the receiving environment; and
- climate change resilience assessment: The resilience of the Proposed Development to climate change impacts, including how the design takes into account projected impacts of climate change resilience of the Proposed Development to impacts from projected climate change.

6.196 The relevance and applicability of each aspect has been considered in the context of the Proposed Development; Table 5 presents scoping outcomes and rationale.

**Table 5 - Scoping outcomes in climate assessment**

Aspect	Scoping outcome	Rationale
Lifecycle GHG impact assessment	Scoped in	Due to its nature and purpose, the Proposed Development is considered likely to result in notable GHG emissions impacts, both in terms of GHG emissions arising through construction and operation and the potential GHG emissions avoided due to repowering.
In-combination climate change	Scoped out	An ICCI assessment is scoped out of the Climate Change assessment on the basis that any identified ICCI will be addressed

Aspect	Scoping outcome	Rationale
impact (ICCI) assessment		in other relevant planning documents and it would not be proportionate to undertake a separate ICCI assessment.
Climate change resilience review	Scoped in	The Proposed Development will be exposed to predicted climate change impacts.

6.197 With regard to the scope of the lifecycle GHG impact assessment itself, construction and operation lifecycle stages have been scoped in due to the size, nature and purpose of the Proposed Development. Table 6 presents the GHG lifecycle scoping outcomes and rationale.

**Table 6 - GHG lifecycle scoping outcomes**

Lifestyle Stage	Activity	Scoped In/Out	Rationale for Scoping Conclusion
Pre-construction stage	Enabling works; Land Clearance; Disposal of any waste generated during the enabling works.	In	GHG emissions are expected to arise from: <ul style="list-style-type: none"> <li>- fuel use for works equipment and vehicles</li> <li>- fuel use for worker commuting</li> <li>- Loss of carbon sink</li> <li>- disposal of waste</li> <li>- fuel consumption of transportation of waste</li> </ul>
Production stage	Raw material extraction and manufacturing of products required to build the Proposed Development.	In	Embodied GHG emissions
Construction process stage	On-site construction activity; Transport of construction materials (where these are not included in embodied GHG emissions); Transport of construction workers; Disposal of any waste generated during the construction processes.	In	GHG emissions from energy (electricity, fuel, etc.) consumption for plant and vehicles, generators on site; Fuel consumption from transport of materials to site (where these are not included in embodied GHG emissions); GHG emissions from fuel use for worker commuting; GHG emissions from disposal of waste; GHG emissions from fuel consumption of transportation of waste.
Operation Stage	Operation of Proposed Development; Maintenance.	In	GHG emissions from operation of the Proposed Development; Potential GHG emissions avoided due to low carbon approach and the beneficial impact of the Proposed Development on the carbon intensity of power generation in the UK as well as

Lifestyle Stage	Activity	Scoped In/Out	Rationale for Scoping Conclusion
			supporting the decarbonization path to net zero; Fuel use for maintenance activities.
Decommissioning	Removal and or renewal of the full Proposed Scheme	Out	The decommissioning or renewal of the Proposed Development is not reasonably foreseeable and would be subject to a separate permission.

6.198 An ICCI assessment identifies how the resilience of receptors in the surrounding environment will be affected by future climate conditions and the proposed scheme. The climate variables relevant to the Proposed Development are detailed in Table 7 .

**Table 7 - Climate variables for the ICCI review of the Proposed Development**

Climate Variable	Scoped In/Out	Rationale for Scoping Conclusion	Planning Document Which Will Consider the Issue/Risk
Extreme weather events	In	The impacts of extreme weather events will be considered as part of the climate change allowances to be made within the Flood Risk Assessment.	Flood Risk Assessment
Temperature change	In	No significant impacts on receptors in the surrounding environment from increased temperatures are anticipated as a result of the combined impact of climate change and the Proposed Development.  However, any residual combined temperature impacts will be considered by the Landscape and Biodiversity Management Strategy.	Landscape and Biodiversity Management Strategy
Sea level rise	In	The Proposed Development Site is located adjacent to the River Trent which is tidal at this location.	A Flood Risk Assessment will consider a range of scenarios and will be informed by future Climate Change Predictions regarding sea level rise. Tidal surge and the potential for embankment breach will be considered.
Precipitation change (increased frequency and magnitude of precipitation events) and rainfall	In	Climate change may lead to an increase in substantial precipitation events that could lead to flash flooding. Projected increases in rainfall will be considered as part of the	Landscape and Biodiversity Management Strategy Flood Risk Assessment

Climate Variable	Scoped In/Out	Rationale for Scoping Conclusion	Planning Document Which Will Consider the Issue/Risk
and low precipitation and drought conditions		<p>Landscape and Biodiversity Management Strategy and Flood Risk Assessment.</p> <p>Climate change may lead to periods of decreased precipitation resulting in water scarcity. The suitability of vegetation used for landscaping for future climate conditions will be considered in the Landscape and Biodiversity Management Strategy</p>	Landscape and Biodiversity Management Strategy
Wind	Out	The impacts of wind on receptors in the surrounding environment are likely to be no worse relative to baseline conditions.	N/A

6.199 Therefore, an ICCI Assessment is scoped out of the Climate Change assessment on the basis that any identified ICCI will be addressed in other relevant planning documents, namely the Landscape and Biodiversity Management Strategy and Flood Risk Assessment.

6.200 The climate change resilience review will consider resilience in terms of both gradual climate change, and the risks associated with the predicted increase in frequency of extreme weather events. It will consider the resilience and adaptation measures for such risks within the proposed design for infrastructure and assets comprising the Proposed Development; the design of which will be assumed to comply with current planning, design and engineering practice and codes.

**Table 8 - Climate Variables for the CCR Review of the Proposed Development**

Climate Variable	Scoped In/Out	Rationale for Scoping Conclusion
Extreme weather events	In	The Proposed Development may be vulnerable to extreme weather events such as storm damage to structures and assets.
Temperature change	In	Increased temperatures may increase cooling requirements of the Proposed Development and could impact on structural integrity of buildings and materials.
Sea level rise	In	The Proposed Development Site is located adjacent to the River Trent which is tidal at this location.
Precipitation change	In	The Proposed Development may be vulnerable to changes in precipitation, for example, pressure on water supply during periods of reduced rainfall, and damage to structures and drainage systems during periods of heavy precipitation.
Wind	Out	The impacts of wind on receptors in the surrounding environment are likely to be no worse relative to baseline conditions.

6.201 Therefore, the climate change resilience review is scoped into the Climate Change assessment. Outputs from the lifecycle GHG impact assessment and the climate change resilience assessment will be presented in a standalone Climate Change Impact Report.

### Population and Human Health

6.202 All of the previously discussed environmental aspects that are or are partially relevant to population and human health are proposed to be assessed against criteria that have been established for the protection of human health (e.g. air quality standards). Therefore, no specific human health impact assessment is proposed for the EIA.

6.203 The ES for the Proposed Development will draw on the assessments of environmental aspects where there is a potential for a significant impact on population and human health (e.g. air quality). A dedicated signposting appendix (related to the Socio-economic chapter) will be provided to summarise the results of the assessment of each environmental aspect, as relevant in order to determine the potential overall (in-combination) impact to identified population and human health receptors.

6.204 The consultations undertaken in defining the methodology, identifying receptors, etc. for the assessment of each environmental aspect will include consideration of population and human health.



### Cumulative and Combined Effects

6.205 In accordance with the EIA Regulations, consideration will also be given to the potential for cumulative impacts to arise. Cumulative impacts are those that accrue over time and space from a number of development activities. The impact of the Proposed Development will be considered in conjunction with the potential impacts from other projects or activities which are both reasonably foreseeable in terms of delivery (e.g. have planning consent) and are located within a relevant geographical scope where environmental impacts could act together to create a more significant overall effect.

6.206 A number of other proposed developments have been identified in the vicinity of the Proposed Development that could potentially result in cumulative impacts during its construction and operation. For the purposes of scoping, major developments which have either been submitted or determined and approved under the Town and Country Planning Act (TCPA) 1990 have been identified within 2km of the Proposed Development Site and are shown on **Figure 3E (Appendix A)**. Projects listed on the PINS National Infrastructure Planning website (Planning Inspectorate, 2020) within 10km of the Proposed Development Site have also been considered; however, none have been identified. Relevant projects identified are shown in Table 9.

**Table 9 - Other developments to be considered in Cumulative Impact Assessment**

ID	Application Reference	Local Planning Authority	Applicant for 'other development' and brief description	Approximate distance from Site	Status
1	PA/2019/1904	North Lincolnshire	Planning permission to erect 30 affordable dwellings with associated access and other works, Old Railway Sidings, A18 From Althorpe To Gunness, Althorpe, DN17 3HN	1km	Undetermined
2	PA/2017/1513	North Lincolnshire	Outline planning permission to erect 27 dwellings with access and layout to be determined and all other matters reserved for subsequent approval, Land off the A18, Althorpe	1.5km	Approved 14/01/2019
3	PA/2017/464	North Lincolnshire	Outline planning permission for up to 14 dwellings with appearance, landscaping, layout and scale reserved for subsequent approval (re-submission of PA/2016/1315), Old Railway Sidings, A18	1km	Appeal Allowed 14/05/2018

ID	Application Reference	Local Planning Authority	Applicant for 'other development' and brief description	Approximate distance from Site	Status
			from Althorpe to Gunness, Althorpe		
4	PA/2019/519	North Lincolnshire	Planning permission to install an underground high voltage (400kV) electric cable and associated works, land at and adjacent to Keadby Power Station, Trent Side, Keadby, DN17 3EF	On Site	Approved 31/05/2019
5	PA/2019/1595	North Lincolnshire	Planning permission to erect a temporary haul road to accommodate Abnormal Vehicle Loads and the construction of two ditch crossings	Adjacent to Site	Constructed (Approved 15 November 2019)
6	PA/2020/104	North Lincolnshire	Retrospective planning application for the reconfiguration of consented CHP office building, retention of 38 portable buildings (19 stacked), two stores, a workshop, fencing and associated works	On Site	Undetermined
7	EN010070	Planning Inspectorate (DCO)	Keadby Windfarm Extension	Adjacent to Site	Project on hold as of 27/05/15
8	Keadby II S36 Consent	Department of Business, Energy and Industrial Strategy (BEIS)	Keadby 2 Section 36 Variation Application(s) 2016/2017/2018	On Site	Under Construction

6.207 Consultation with North Lincolnshire Council will be undertaken in respect of identifying any additional proposals or planning applications submitted under the TCPA 1990 that may also have the potential to produce significant cumulative environmental effects. NSIP and projects submitted under other consenting regimes will also be considered in line with PINS Advice Note 17: Cumulative Effects Assessment (Planning Inspectorate, 2019).

6.208 Combined effects will also be assessed. The combination of predicted environmental impacts resulting from a single 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), are referred to as combined effects.

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### **Combined Heat and Power (CHP) Assessment**

- 6.209 Although not formally part of the EIA, it is a requirement of the NPS that applicants for all new power stations explore and develop feasible CHP opportunities. This is in order to maximise the use of waste heat and in turn the thermal efficiency of the proposed combustion plant.
- 6.210 A CHP investigation will be undertaken as part of the DCO application which will involve identifying and contacting potential CHP users in the local area in accordance with the EA CHP Ready Guidance (Environment Agency, 2013). This will initially be based on examining a map around the Site based on a predetermined economic radius for heat transportation. Should any potential uses be identified, a 'heat map' of the local area would be produced incorporating community, commercial and industrial heat uses and opportunities. Within this 'heat map' area the identified users would then be classified into user sectors. Community opportunities would mainly consider industrial, residential and housing opportunities, though would also include any hotels, leisure centres, large corporate buildings, hospitals, universities, prisons, defence installations and accommodation complexes. Industrial opportunities would be readily identified by the industrial sector of those industries inside the 'heat map' radius.
- 6.211 The CHP feasibility review will consider the heat availability from the Proposed Development together with future CCS implications and the heat demand opportunities in the locality to justify the approach that will be taken for maximising CHP opportunities for the plant.

### **Carbon Capture Readiness (CCR) Assessment**

- 6.212 CCR needs to be demonstrable for all new combustion generating stations with a generating capacity at or over 300 MW (and of a type covered by the European Union Large Combustion Plant Directive (European Commission, 2001) as set out in Section 4.7 of the Overarching National Policy Statement (NPS) (EN-1) (DECC, 2011a).
- 6.213 As discussed in Section 1, the Applicant is committed to developing the Proposed Development as a low carbon generating station and this will either include a CCP or will be hydrogen fired. Consequently, if CCS technology is to be employed on the Proposed Development, concept design and layout details will be provided on the sizing and configuration of a CCP that will therefore go beyond the minimum requirements set out in the CCR requirements. If hydrogen firing is employed, the layout will similarly demonstrate how this is achieved and that the design of the Proposed Development achieves low carbon generation.
- 6.214 The Applicant does intend to provide a standalone CCR Report, however, it is envisaged that this document would primarily be a signposting document for the purpose of demonstrating that the requirements of the DECC CCR Guidance (DECC, 2009) have been met through the compilation of the Application. Should any requirement of the guidance not be addressed in the Application, this would be addressed in this document.

## 7.0 MATTERS TO BE SCOPED OUT

### **Operational road traffic, including related air quality and noise and vibration effects**

- 7.1 At this stage the volume of traffic associated with the operational phase of the Proposed Development is unknown. However, it is anticipated that the effects of operational traffic would be considerably lower than those generated during the construction phase. Depending on the forecast volumes of operational traffic, a detailed environmental assessment of this phase would potentially be scoped out following agreement on the TA scope with the relevant highway authorities.
- 7.2 Using the operational forecast traffic flows from the TA scoping report, relevant screening criteria for air quality and noise and vibration will be applied in order to determine the potential for significant effects from the Proposed Development. Depending on the forecast volumes of operational traffic, a detailed assessment of this phase would potentially be scoped out with North Lincolnshire Council for air quality and noise and vibration.

### **Terrestrial and Aquatic Ecology (surveys not required)**

- 7.3 Surveys for the following species have been scoped out in relation to the Main Site:
- Great crested newt – a PEA undertaken by AECOM for the Applicant in 2017 covered all land relevant to determination of the potential great crested newt constraints to the Proposed Development. This work confirmed that there is no reasonable likelihood of great crested newt occurring in the zone of influence of the Proposed Development. In 2010, AECOM surveyed all ponds within the Proposed Development Site, no great crested newts were found, and all ponds were found to have dried up by July that year. In 2012 and 2015, ecologists from Jacobs undertook monitoring surveys for Keadby Wind Farm that involved surveys of ponds within the Proposed Development Site and on adjacent land. Again, the species was not found. Work completed by AECOM in 2017 did not involve surveys for great crested newt but again confirmed that all of the ponds within the Site dry up by July and are therefore that these are unsuitable to support a breeding population of great crested newt. The combined prior evidence indicates that there is no reasonable likelihood of great crested newt occurring in the zone of influence of the Proposed Development. There are also no desk study records for great crested newt in the local area.
  - Bat roost surveys – the Proposed Development is not anticipated to affect existing buildings or structures that may have potential to contain bat roosts. It is also not anticipated that any trees potentially suitable for use by roosting bats will be affected. Previous surveys completed by AECOM did not find any trees of suitable age or condition for use by roosting bats within the Proposed Development Site and this will be re-confirmed during the planned PEA.
  - Reptiles – the Proposed Development Site is largely unsuitable for reptiles as it is under arable farmland or is covered by existing power station infrastructure. The

only cohesive area of optimal habitat for reptiles is that within Keadby Ash Tip and this was surveyed by AECOM in 2017 using standard good practice methods. This survey only recorded a single juvenile grass snake and no evidence of a site dependent reptile population was found. This snake was recorded on the western boundary of Keadby Ash Tip beyond the land required for the Proposed Development.

- Breeding birds – the Proposed Development Site is largely under arable farmland or is covered by existing power station sites. Notable species or assemblages are not likely to occur in these areas, with the bird species present typical of comparable habitats in the wider landscape. Previous surveys by AECOM in 2017, and for the Keadby 2 Power Station Environmental Statement in 2015, collected breeding bird data for high quality habitats within and adjacent to the Proposed Development Site. These data are sufficiently current to be suitable to inform the impact assessment for the Proposed Development, given the habitats present remain comparable. Further survey is therefore not considered necessary or proportionate given the prevailing habitat context over most of the Proposed Development Site.
- Wintering and passage birds – the Proposed Development Site comprises arable farmland adjacent to the construction site for the Keadby 2 Power Station and an existing National Grid substation, with the majority of the remaining land area in the Keadby 1 and 2 Power Station sites. These habitats are unlikely to be of importance for notable wintering and passage bird species or assemblages. Land within Keadby Ash Tip is not considered to be of specific value for wintering and passage birds given the prevailing habitats present are OMH, acid grassland, and dense secondary woodland and scrub. For these reasons, it is also considered that robust assessment of the potential impacts and effects on the Humber Estuary SPA can be made without a need for wintering and passage bird survey.
- Terrestrial invertebrate survey – the potential value of acid grassland and OMH for terrestrial invertebrates is acknowledged, but detailed specialist surveys of these habitats within the Proposed Development Site have previously been undertaken by AECOM in 2017. These detailed data are sufficiently current to inform the impact assessment for the Proposed Development, without a need to undertake further surveys.
- Aquatic surveys – as the River Trent is tidal at the location, surveys of aquatic flora are not proposed within the River Trent. The results of previous surveys will be collated and used to determine the need for further aquatic surveys of the River Trent, taking into account the parameters for the abstractions and discharges associated with the Water Connection Corridors for the Proposed Development. The approach to any surveys proposed will be agreed with relevant stakeholders and presented in the PEI Report.

### **Waste and Materials**

- 7.4 Waste is defined as per the Waste Framework Directive (2008/98/EC) as "any substance or object which the holder discards or intends or is required to discard" and this

definition is transposed into law in England and Wales by The Waste (England and Wales) Regulations 2011.

- 7.5 There is potential for waste to be generated during the construction of the Proposed Development, and subsequently during operation and maintenance. Materials will be required for the construction of the Proposed Development.
- 7.6 The generation of waste during construction, operation and decommissioning of the Proposed Development has the potential to cause impacts on the capacity of the waste infrastructure in the region.
- 7.7 As a producer of waste, the Applicant has a Duty of Care to ensure that its waste is managed effectively and in full compliance with applicable regulations and guidance. The EIA Regulations require 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. Such information will be provided including:
- proposals for maintaining a materials balance of cut and fill volumes;
  - compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery before disposal; and
  - impacts on relevant plans and policies (waste and materials) including available landfill capacity of the region.
- 7.8 It is proposed that information on types and quantities of waste will be provided in the ES, and measures included in the Framework CEMP to manage construction waste in accordance with the waste hierarchy. On this basis, it is proposed that a standalone chapter will not be provided.

#### **In-combination and decommissioning phase climate change impacts**

- 7.9 An ICCI assessment is scoped out of the Climate Change assessment on the basis that any identified ICCI will be addressed in other relevant planning documents and it would not be proportionate to undertake a separate ICCI assessment.
- 7.10 The decommissioning stage has been scoped out of the climate change assessment, as the decommissioning or renewal of Proposed Development is not reasonably foreseeable and due to the uncertainty in methods.

#### **Electronic interference**

- 7.11 The proposed maximum building heights and expected temporary construction cranes will be no higher than those associated with the Keadby 2 Power Station under construction. Therefore, an assessment of the Proposed Development's effect on electronic interference is not considered to be required.
- 7.12 Further to this, analogue signals have ceased to be transmitted and have been replaced by digital signals. As such, the Proposed Development's potential to interfere with

television, radio (both analogue and digital) and mobile phone reception is considered negligible.

### Aviation

- 7.13 It is proposed to scope out impacts on aviation based on the height of the stacks and buildings associated with the Proposed Development as these are anticipated to be comparable to the heights of structures and stacks consented/ built within the Keadby 2 and Keadby 1 Power Stations (85m and 60m respectively). On this basis, the Applicant considers that a stand-alone chapter is not required.
- 7.14 The Civil Aviation Authority (CAA) will however be consulted on the Proposed Development to review any requirements for aviation lighting on the stack(s) and enable the Proposed Development to be charted in future. Should taller stacks or cranes be required than currently expected, the need for an aviation assessment will be reviewed accordingly.

### Major Accidents or Disaster Vulnerability

- 7.15 An application to the Environment Agency for an environmental permit will be required, in accordance with the Environmental Permitting (England and Wales) Regulations 2016, in order to allow for the operation of the Proposed Development.
- 7.16 Applications for an environmental permit require an environmental risk assessment (ERA) to be undertaken in order to consider the potential environmental risks from the operation of a project, including:
- any discharge, for example sewage or trade effluent to surface or groundwater;
  - accidents;
  - odour;
  - noise and vibration;
  - uncontrolled or unintended ('fugitive') emissions; and
  - visible emissions, for example smoke or visible plumes.
- 7.17 The Environment Agency '*Risk assessments for your environmental permit*' (February 2016) provides further guidance regarding the identification of accidents and the scope of the ERA:

"Examples of possible accidents include:

- transferring substances, for example loading or unloading vessels;
- overfilling vessels;
- plant or equipment failure, for example over pressurised vessels and pipework, blocked drains, fire and contaminated water used to fight the fire escaping into the local watercourse or ground;

- releasing an effluent before checking its composition;
- vandalism;
- flooding; and
- inadequate bunding around tanks.

There could also be a risk of accidents related to your specific industry.”

7.18 Risks specific to this low-carbon project will be considered within the ERA accompanying the Environmental Permit application; this includes accidental releases associated with the CCP and/or those associated with the transport and storage of fuel for a hydrogen-fired gas turbine.

7.19 In addition, it is likely that the amounts of process chemicals/ substances that may be stored on-site will trigger the need for the Proposed Development to accord with the Control of Major Accident Hazards Regulations 2015 (COMAH) for which, depending upon the nature of the potential hazard, the following documents may be required:

- Major accident prevention policy (MAPP); and/ or
- Safety Report.

7.20 A MAPP is, by legislation, required to include details of the operator’s policy regarding the aims and principles that are implemented to prevent major accidents at a site and a description of the safety management system that will be used to deliver these. Current Health and Safety Executive (HSE) guidance on the content of a MAPP is that it should include:

- roles and responsibilities of personnel at all levels involved in the management of the major hazards;
- arrangements for selecting personnel and providing training to ensure they are competent to work with a major hazard;
- hazard identification and risk assessment;
- procedures and instructions for safe operation;
- design and modifications of installations;
- identification of foreseeable emergencies and the preparation, test and review of emergency procedures;
- measuring compliance; and
- review and audit.

7.21 A safety report is required for higher risk (“upper tier”) sites which builds on the provisions of the MAPP. A safety report will require assessment and acceptance by the HSE, as the competent authority for COMAH.

7.22 In light of the above, it is considered that the risks of major accidents is suitably assessed, regulated and controlled by other legislative frameworks, therefore, the assessment of



major accidents is not proposed for specific assessment within the EIA. However, accidental events such as the potential for fuel spillages and abnormal air emissions, and how the risk of these events will be minimised, will be discussed in the relevant chapters of the ES. Accidental events will be covered by a brief risk assessment in the ES, which will include reference to the Applicant's overarching principles of emergency management.

7.23 The assessment provided for the ERA will encompass a screening of major accident events, but also natural events (disasters) that could meet the definition of a major accident for the purposes of the EIA Regulations, (e.g. events arising from natural sources such as extreme weather (storm, flood, temperature) and ground-related hazard events (subsidence, landslide, earthquake). Where risks are identified that have the potential to result in a significant adverse effect on an environmental receptor, design mitigation necessary to reduce the risk to as low as reasonably practicable shall be identified.

**Summary of issues proposed to be scoped out of ES**

7.24 The following issues are proposed to be scoped out of the ES that accompanies the Application:

**Table 10 - Matters proposed to be scoped out of ES**

Aspect	Construction	Operation	Decommissioning
1.0 Road Traffic Assessment (Traffic and Transport Chapter)	-	Yes	-
2.0 Road traffic noise and vibration assessment	-	Yes	-
3.0 Air quality assessment for road traffic emissions	-	Yes	-
4.0 In-combination climate change impacts (Climate Change)	Reported in other assessments		Yes
5.0 Aviation	Yes	Yes	Yes
6.0 Electronic Interference	Yes	Yes	Yes
7.0 Major Accidents and Disasters	Yes	Yes	Yes

## 8.0 EIA PROCESS

### EIA methodology and reporting

- 8.1 The ES will set out the process followed during the EIA including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.
- 8.2 The EIA process is designed to be capable of, and sensitive to, changes that occur as a result of changes to the design, including any mitigation measures that are incorporated during the EIA. This will be particularly important for the Proposed Development as the design and layout is still being refined, and minor changes are likely to be made following submission of this EIA Scoping Report.
- 8.3 The EIA is based on a number of related activities, as follows:
- establishing existing baseline conditions;
  - consultation with statutory and non-statutory consultees throughout the DCO application process;
  - consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
  - consideration of technical standards for the development of significance criteria;
  - review of secondary information, previous environmental studies and publicly-available information and databases;
  - physical surveys and monitoring;
  - desk-top studies;
  - computer modelling;
  - reference to current legislation and guidance; and
  - specialist opinion.
- 8.4 Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies

(major, moderate, minor and negligible). For the purpose of the EIA, moderate and major effects will be deemed 'significant'.

- 8.5 Where likely significant environmental effects are identified in the assessment process, measures to mitigate these effects will be put forward in the form of recommendations to be undertaken as part of the project development.

### **Structure of the ES**

- 8.6 The ES will address the direct effects of the Proposed Development in addition to the likely indirect, cumulative, short, medium and long term, permanent, temporary, beneficial and adverse effects. The mitigation measures envisaged in order to prevent, reduce or where possible offset significant adverse effects will also be described. The concluding chapters will provide a summary of the cumulative and combined effects and likely significant residual environmental effects.

- 8.7 The ES will comprise the following set of documents:

- Non-Technical Summary (NTS): this document will provide a summary of the key issues and findings of the EIA in non-technical language;
- Volume I: Environmental Statement: this will contain the full text of the EIA;
- Volume II: Technical Appendices: these will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs; and
- Volume III: Figures.

### **Structure of technical chapters**

- 8.8 Chapters 8-18 will be structured based on the following sub-headings:

#### Introduction

- 8.9 The Introduction will describe the format of the assessment presented within the chapter.

#### Legislation and planning policy context

- 8.10 The Legislation and Planning Policy Context section of the technical chapters will provide an overview of the relevant legislation, planning policy and technical guidance relevant to the assessment.

#### Assessment methodology and significance criteria

- 8.11 The methods used in undertaking the technical study will be outlined in this section with references to published standards (e.g. British Standards, Building Research Establishment), guidelines (e.g. DMRB and Institute of Environmental Management & Assessment guidelines) and relevant significance criteria.

- 
- 8.12 The significance of effects before and after mitigation will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it is not possible to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant technical assessment chapter.
- 8.13 Specific criteria for each technical assessment will be developed, giving due regard to the following:
- extent and magnitude of the impact;
  - impact duration (whether short, medium or long term);
  - impact nature (whether direct or indirect, reversible or irreversible);
  - whether the impact occurs in isolation, is cumulative or interactive;
  - performance against environmental quality standards where relevant;
  - sensitivity of the receptor; and
  - compatibility with environmental policies and standards.
- 8.14 For issues where definitive quality standards do not exist, significance will be based on the:
- local, district, regional or national scale or value of the resource affected;
  - number of receptors affected;
  - sensitivity of these receptors; and
  - duration of the impact.
- 8.15 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental components, the following terminology will be used throughout the ES to define effects:
- adverse – detrimental or negative effect to an environmental resource or receptor; or
  - beneficial – advantageous or positive effect to an environmental resource or receptor; and
  - negligible – imperceptible effect to an environmental resource or receptor; or
  - minor – slight, very short or highly localised effect of no significant consequence; or
  - moderate – more than a slight, very short or localised effect (by extent, duration or magnitude) which may be considered significant; or
  - major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

- 8.16 As indicated above, for the purpose of this EIA moderate and major effects will be deemed 'significant', and where possible mitigation measures will be identified to reduce the residual effects to 'not significant'.
- 8.17 Each of the technical chapters will provide the criteria, including sources and justifications, for quantifying the different levels of residual effect. Where possible, this has been based upon quantitative and accepted criteria (for example, the National Air Quality Strategy objectives or noise assessment guidelines), together with the use of value judgement and expert interpretation to establish to the scale of an effect.

#### Baseline conditions

- 8.18 In order to assess the potential impacts and effects of the Proposed Development, it is necessary to determine the environmental conditions that currently exist on site and in the surrounding area, for comparison. These are known as the 'existing baseline conditions'. Baseline conditions are determined using the results of site surveys and investigations or desk based data searches, or a combination of these, as appropriate.
- 8.19 'Future baseline conditions', which are the likely future conditions in the study area in the absence of the Proposed Development, will also be considered and described. In particular, consideration will be given to future operation of Keadby 2 (currently under construction) and the potential future inclusion of CCP on Keadby 2 will also be considered.
- 8.20 For the purposes of assessment, each chapter will identify a reasonable 'worst case scenario' with regards these future baseline scenarios; for example, the Traffic and Transport assessment will assume the peak of any proposed K2 CCS construction traffic will coincide with peak construction traffic for the Proposed Development.

#### Development design and impact avoidance

- 8.21 Measures that have been integrated into the Proposed Development in order to avoid or reduce adverse environmental effects will be described. Such measures may include refinement of the design and layout of the Proposed Development to avoid impacts on sensitive receptors, implementation of Construction Environmental Management Plans, and adherence of relevant legislation, guidance and best practice. The assessment of impacts and effects will take account of these measures already being in place.

#### Likely impacts and effects

- 8.22 This section will identify the likely impacts resulting from the Proposed Development. The magnitude of impacts is defined with reference to the relevant baseline conditions (existing or future, as appropriate), and effects are determined in accordance with the identified methodology.

### Mitigation and enhancement measures

- 8.23 The Mitigation and Enhancement Measures section will describe the measures that will be implemented by the Applicant to reduce any significant adverse effects identified by the assessment and enhance beneficial effects during construction and operation of the Proposed Development.

### Monitoring

- 8.24 The EIA Regulations make provision for post-consent monitoring of significant adverse effects on the environment in appropriate cases. Where post-consent monitoring is considered necessary to secure the success of mitigation measures, this will be described and included in the Schedule of Commitments (ES Volume II). The Applicant will work with the relevant responsible authorities to develop appropriate monitoring, where required.

### Residual effects and conclusions

- 8.25 Effects of the Proposed Development remaining following the implementation of available mitigation measures are known as 'residual effects'. These will be discussed for each of the potential effects, and their significance level identified.

### **Scoping and consultation**

- 8.26 The process of consultation is critical to the development of a comprehensive and balanced ES. The views of statutory and non-statutory consultees serve to focus the environmental studies and to identify specific issues that require further investigation. Consultation is an ongoing process, which enables mitigation measures to be incorporated into the project design thereby limiting adverse effects and enhancing environmental benefits.
- 8.27 Following the publication of this EIA Scoping Report, non-statutory consultation on the Proposed Development will be undertaken, using a range of methods available to the Applicant which may include newsletters, a telephone line, Twitter, a project website and virtual or physical exhibitions. The website will be maintained throughout the construction and operational phases of the Proposed Development to provide up-to-date information.
- 8.28 As required by Section 47 of the 2008 Act, the Applicant will prepare a Statement of Community Consultation (SoCC). The SoCC will outline the methods and timescales for the statutory consultation with the local community. North Lincolnshire Council will be fully consulted on the draft SoCC prior to publication.
- 8.29 The PEI Report will be provided for statutory consultation, which will take place later in 2020. As for the non-statutory consultation, a range of methods including newsletters and ongoing use of the project website will be considered.

- 8.30 All responses received during consultation will be carefully considered and taken into account in the development of the project, in accordance with Section 49 of the 2008 Act. Details of any responses received during consultation and the account taken of those responses will be included in a Consultation Report, as required by Section 37 of the 2008 Act. This Consultation Report will be submitted with the DCO Application to the PINS and will be available for public review at that point.
- 8.31 The Consultation Report will demonstrate how the Applicant has complied with the consultation requirements of the 2008 Act and will be considered by PINS, both when determining whether to accept the Application, and then in examining the Application.

## 9.0 SUMMARY

9.1 This EIA Scoping Report has identified the potential for significant effects to arise from the construction and operation of the Proposed Development. The following specialist assessments are proposed:

- Air Quality;
- Noise and Vibration;
- Traffic and Transportation (including Transport Assessment);
- Ecology;
- Water Resources and Flood Risk (including Flood Risk Assessment);
- Geology, Hydrogeology and Land Contamination;
- Landscape and Visual Amenity;
- Cultural Heritage;
- Socio-economics (including population and health signposting);
- Climate Change and Sustainability (including greenhouse gas emissions assessment); and
- Cumulative and Combined Effects.

9.2 The detailed assessments for each of these topics will be undertaken in accordance with standard guidance and best practice and reported in the ES. Where significant effects are identified, mitigation measures will be described where possible to reduce the residual effects.

9.3 This EIA Scoping Report is now submitted to PINS with a formal request for a Scoping Opinion in accordance with Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as amended.



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## APPENDIX 1 – FIGURES

**Figure 1:** Site Location Plan

**Figure 2A:** Indicative DCO Site

**Figure 2B:** Indicative DCO Site Layout

**Figure 3A:** Statutory and Non-Statutory Designated Ecological Sites

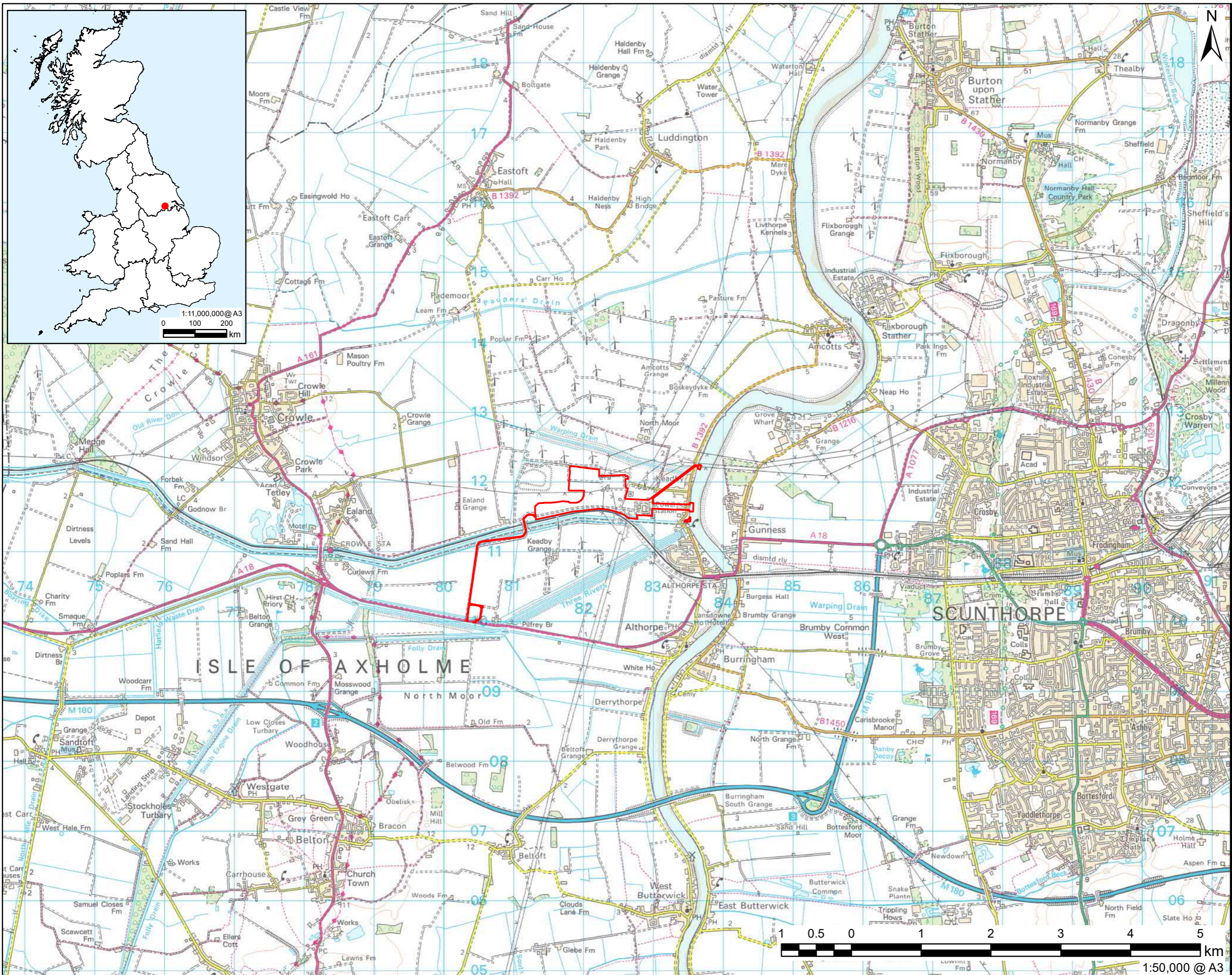
**Figure 3B:** Designated Heritage Assets within 1km, 3km and 5km of the Proposed Development Site

**Figure 3C:** Water Receptors within 5km of the Proposed Development Site

**Figure 3D:** Other Constraints within 5km of the Proposed Development Site

**Figure 3E:** Other Developments to be Considered in Cumulative Impact Assessment

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Revision: 01  
Drawn: JW  
Checked: CN  
Approved: RW  
Date: 05/05/2020



**PROJECT**  
Keadby 3 Low-Carbon Gas Power Station Project Scoping Report

**CLIENT**  
SSE Generation Limited

**CONSULTANT**  
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Midpoint  
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**LEGEND**  
Proposed Development Site

**NOTES**  
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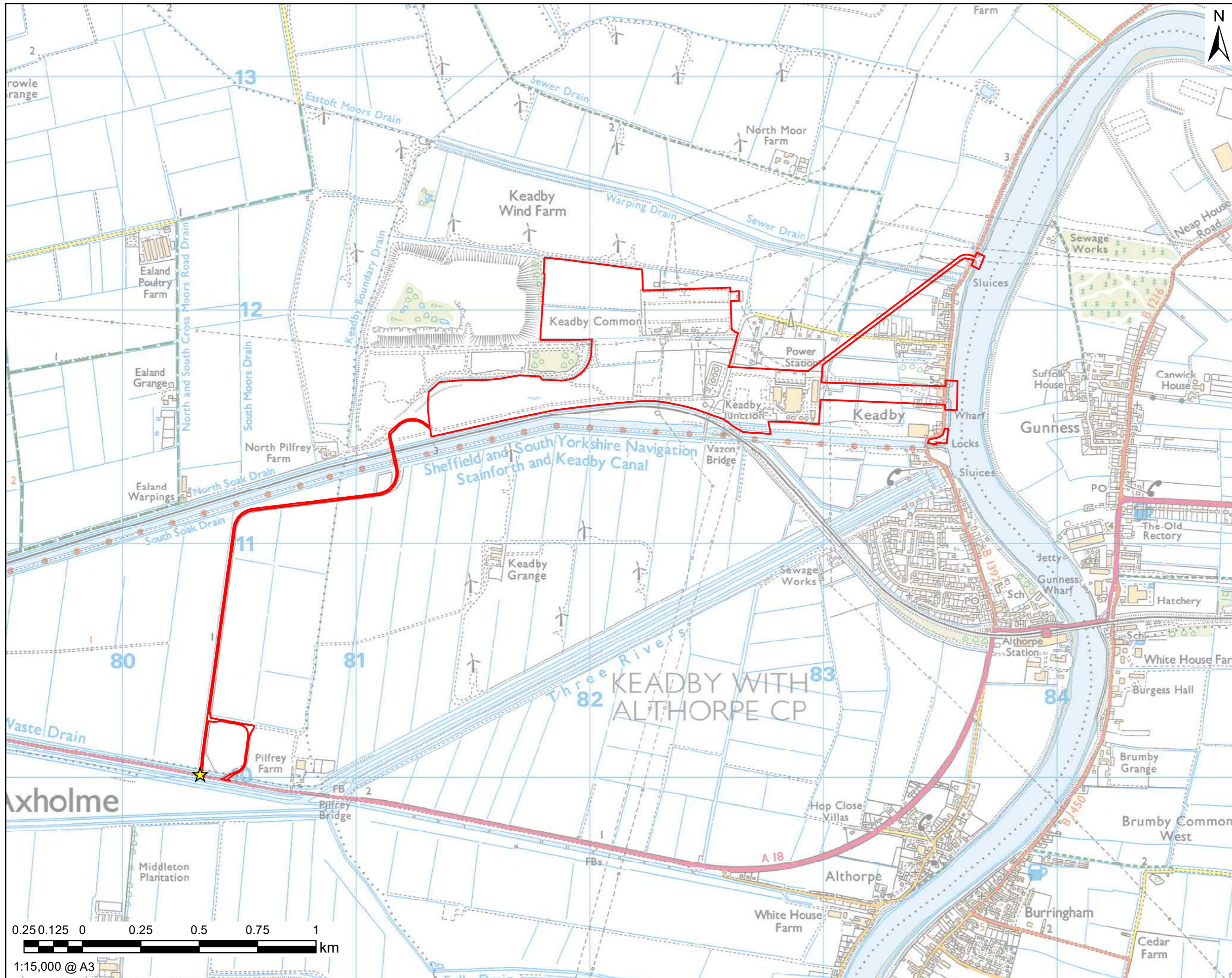
**ISSUE PURPOSE**  
EIA SCOPING REPORT  
**PROJECT NUMBER**  
60625943  
**SHEET TITLE**  
Site Location Plan

**SHEET NUMBER**  
Figure 1

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- Proposed Development Site
- Option for Construction Access to the Proposed Development Site

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- Proposed Development Site
- Indicative Area:
- Keadby 1
- Keadby 2
- Keadby 2 Laydown Area (Keadby 3 Option 2)
- Keadby 3 CCGT (Option 1)
- Keadby 3 Indicative Laydown and Biodiversity Area
- Keadby 3 CO2 Capture Plant (Option 1)
- Waterborne Transport Off-Loading Area
- Construction Access Route
- Water Connection Corridor
- Potential Discharge Option
- Potential Abstraction Option
- Electrical Connection Area to National Grid 400kV Substation

NOTES

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ISSUE PURPOSE

EIA SCOPING REPORT

PROJECT NUMBER

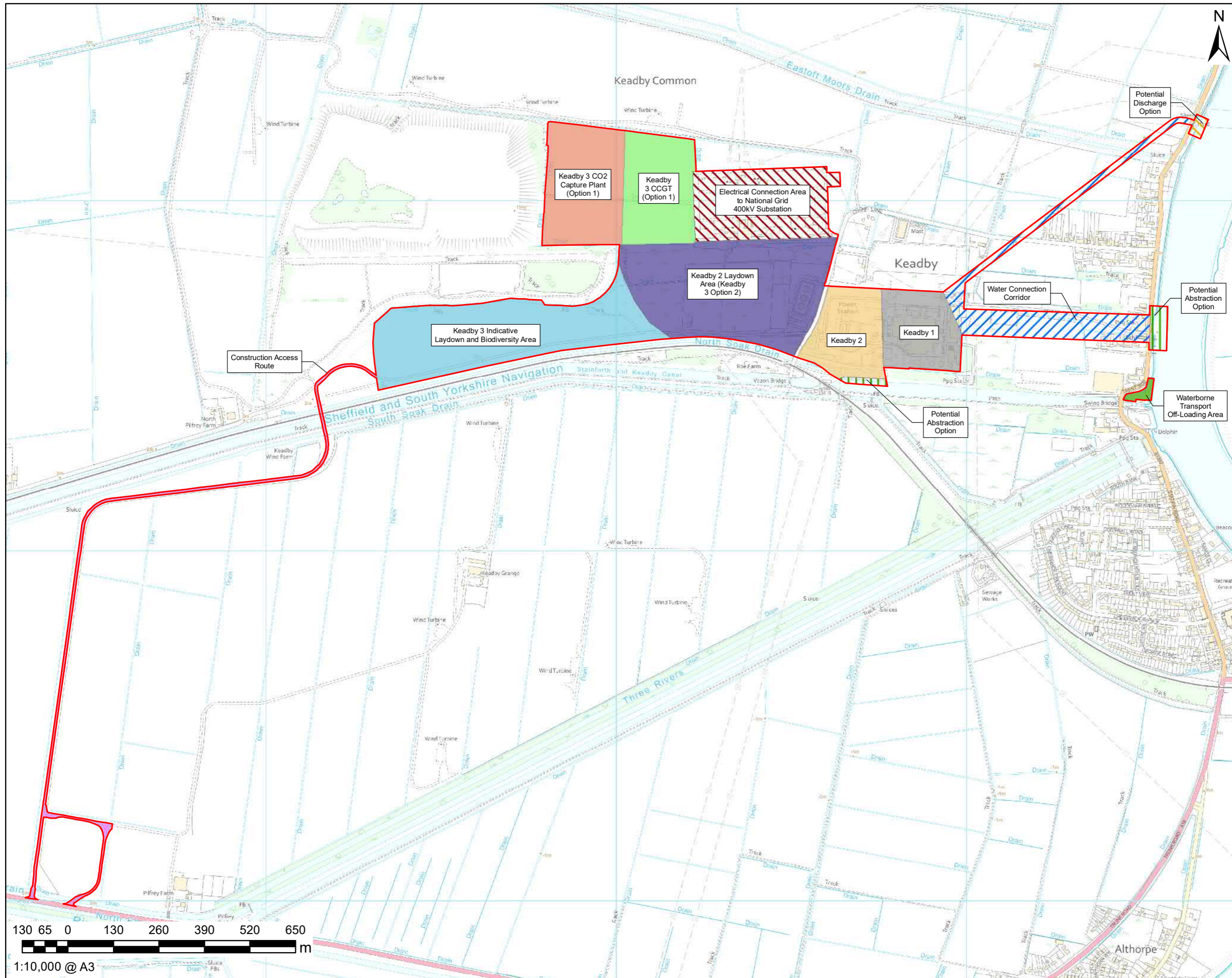
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SHEET TITLE

Indicative DCO Site Layout

SHEET NUMBER

Figure 2B



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**LEGEND**

	Proposed Development Site
	15km Study Area
	Local Authority Boundary
	Ancient Woodland
	Local Nature Reserve (LNR)
	National Nature Reserve (NNR)
	Ramsar
	Site of Special Scientific Interest (SSSI)
	Special Area of Conservation (SAC)
	Special Protection Area (SPA)
	Local Wildlife Site (LWS)

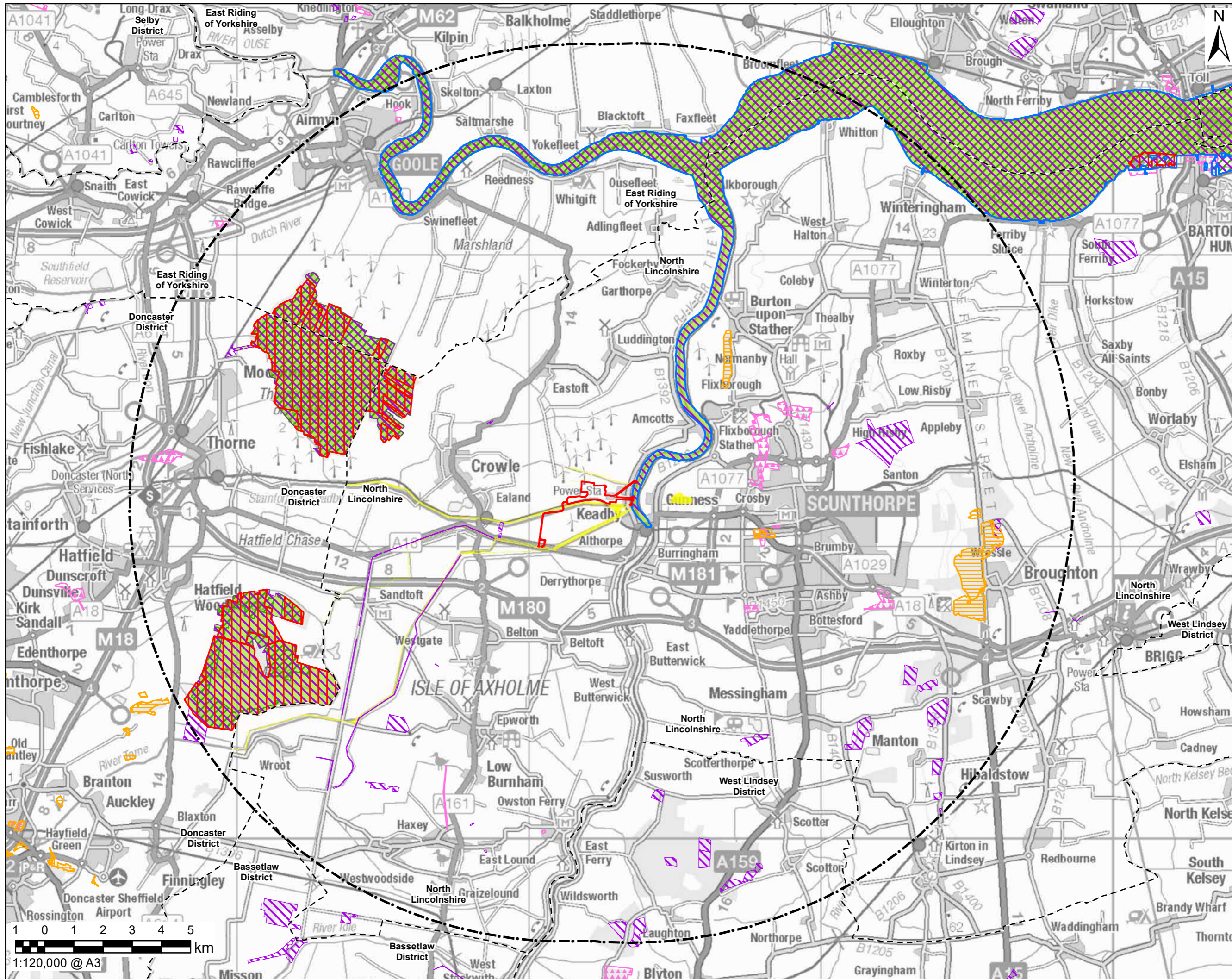
**NOTES**  
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LWS: NB This national dataset is "indicative" not "definitive". Definitive information can only be provided by individual local authorities and you should refer directly to their information for all purposes that require the most up to date and complete dataset.

**ISSUE PURPOSE**  
EIA SCOPING REPORT

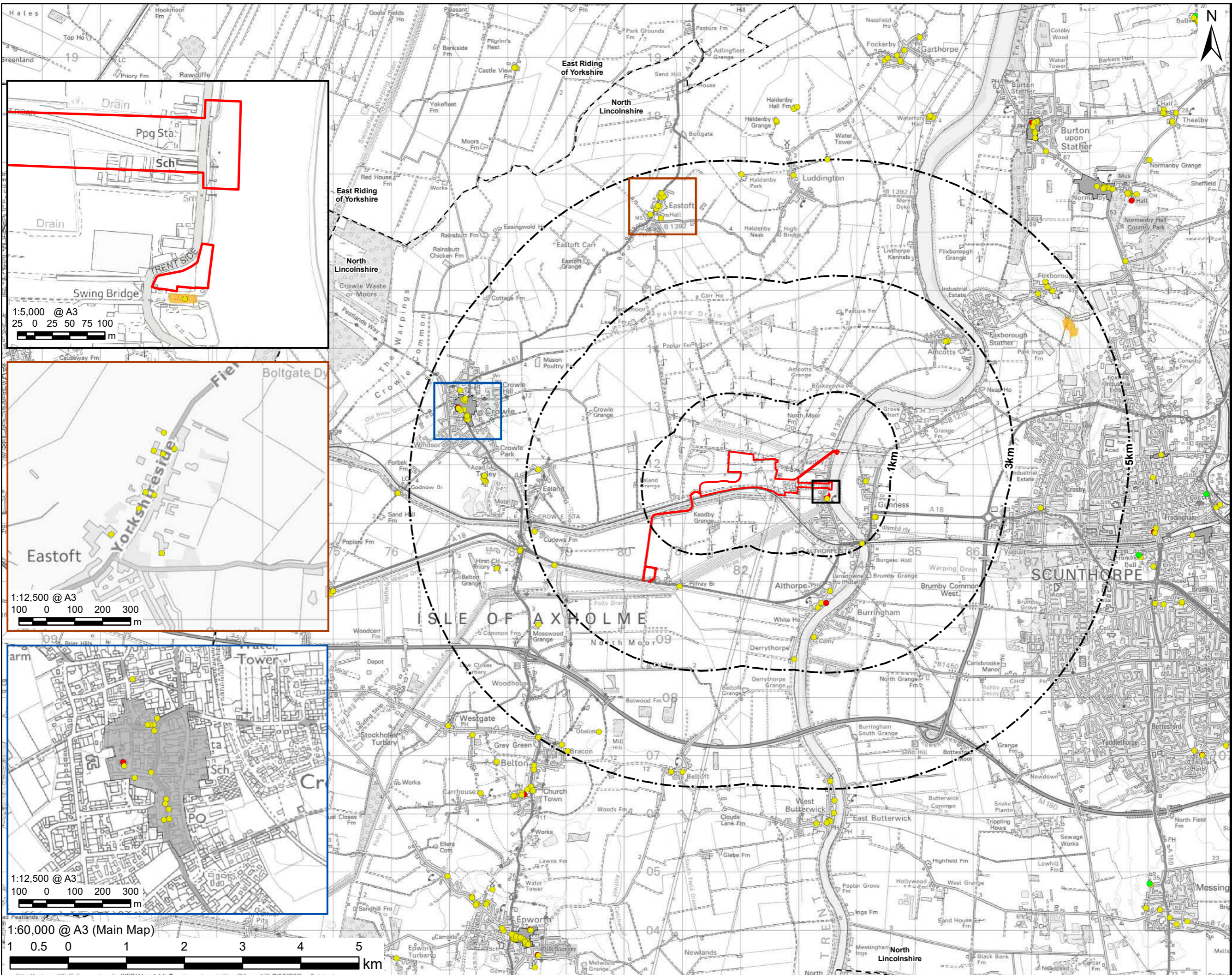
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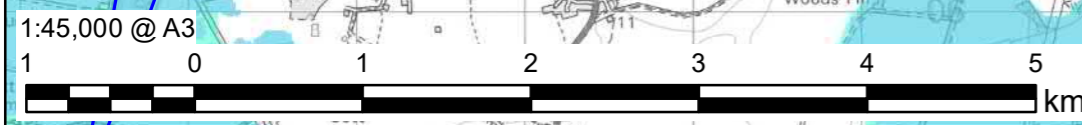
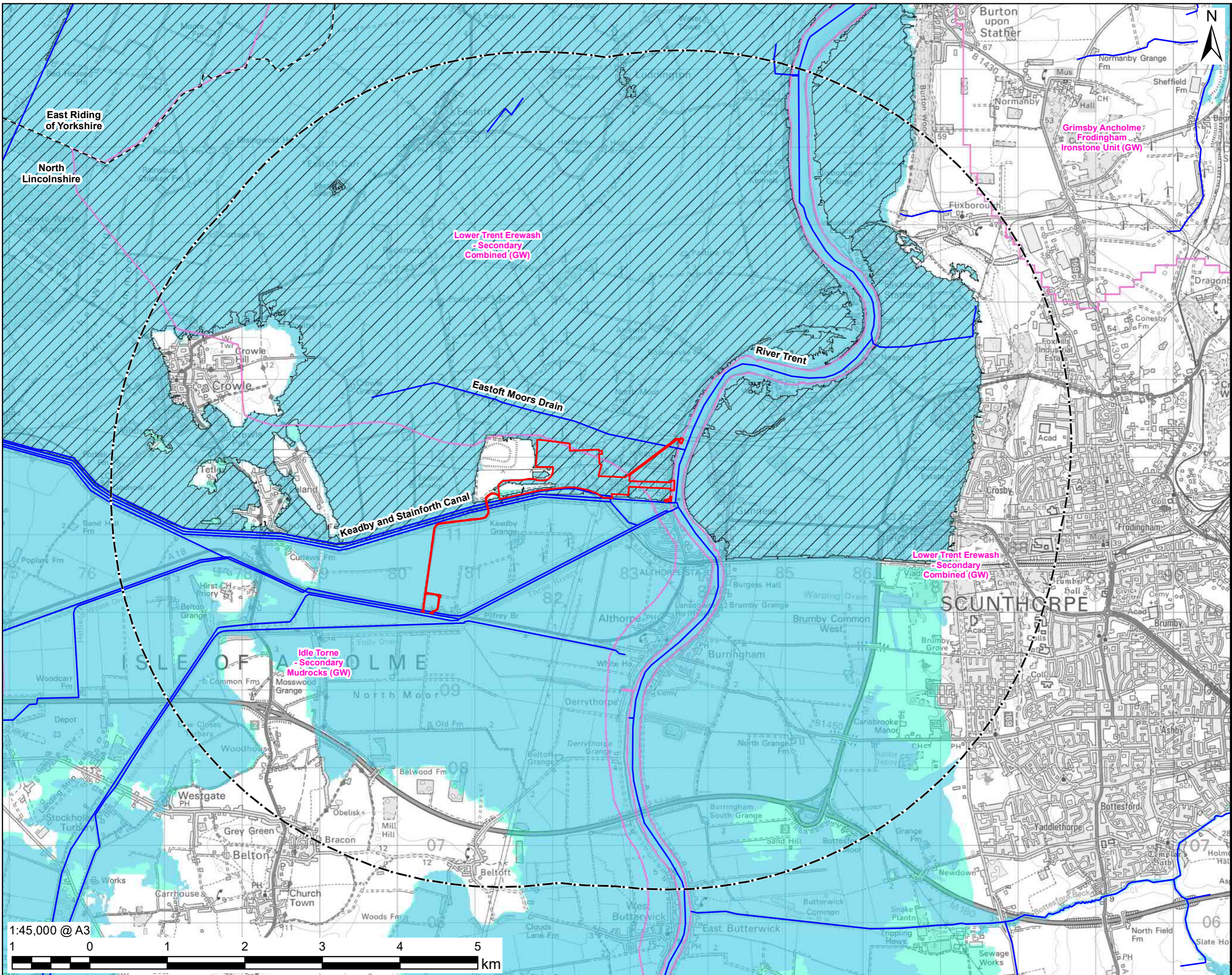
**SHEET TITLE**  
Statutory and Non-Statutory  
Designated Ecological Sites

**SHEET NUMBER**  
Figure 3A



Filename: C:\Users\Ben.O'Neill\Documents\Local02 SSE Keadby07 CAD & GIS\02\_Maps\Scoping\General\FiguresK\_Scoping\_Fig03A\_Env\_Receptors\_15km\_A3\_20200505\_R01.mxd  
Revision: 01  
Drawn: JW Checked: CN Approved: RW Date: 05/05/2020





**LEGEND**

- Proposed Development Site
- 5km Study Area
- Local Authority Boundary
- River (OS Open Rivers)
- Area Benefiting from Flood Defence
- Flood Zone 2
- Flood Zone 3
- WFD Groundwater Body (GW)

**NOTES**  
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**ISSUE PURPOSE**  
 EIA SCOPING REPORT

**PROJECT NUMBER**  
 60625943

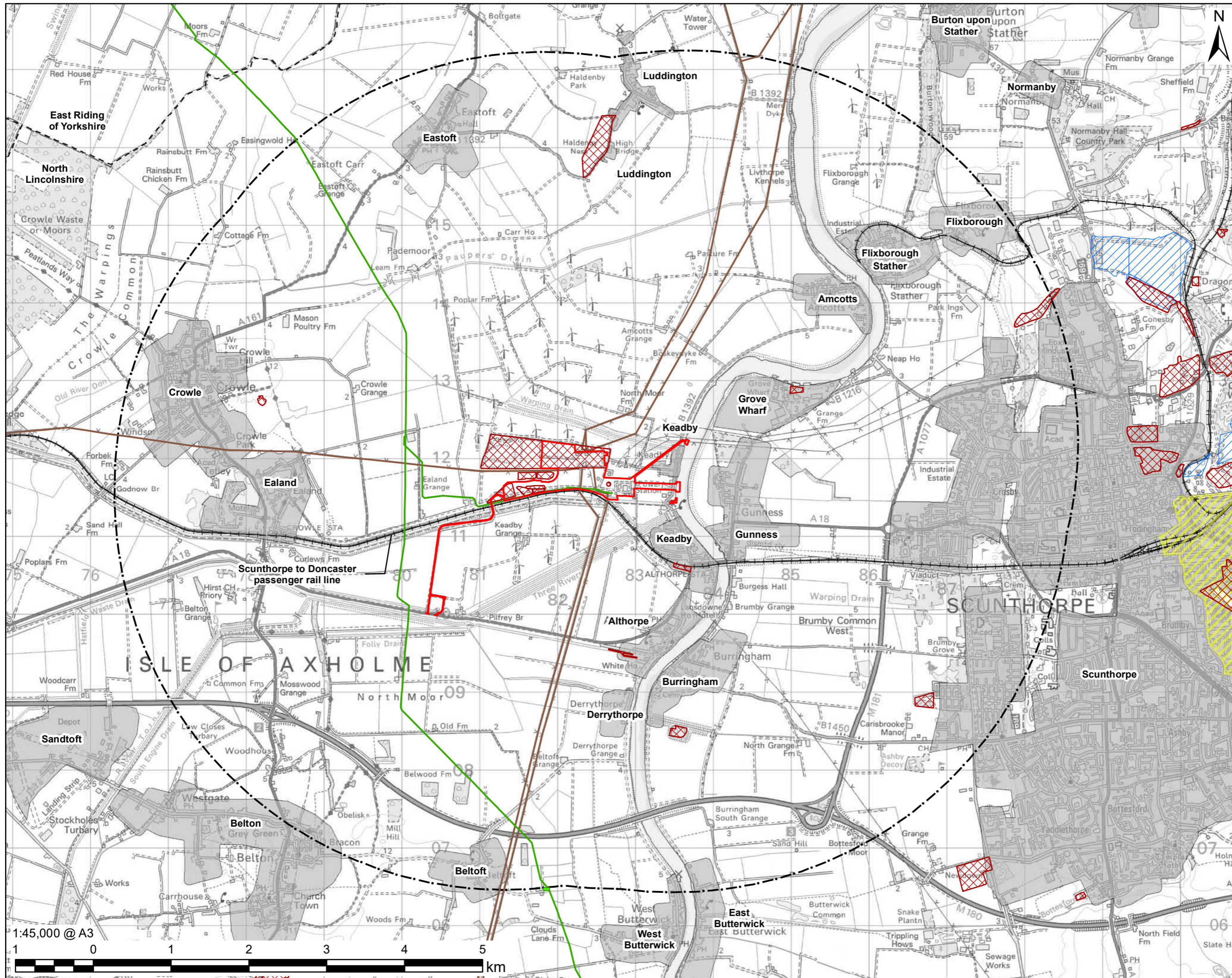
**SHEET TITLE**  
 Water Receptors within 5km of the Proposed Development Site

**SHEET NUMBER**  
 Figure 3C




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- Proposed Development Site
- 5km Study Area
- Local Authority
- Settlement / Residential / Commercial Area
- Air Quality Management
- Historic Landfill Site
- Permitted Waste Site / Authorised Landfill Site
- Railway Line
- National Grid
- Gas Pipe
- Gas Site
- Overhead Line

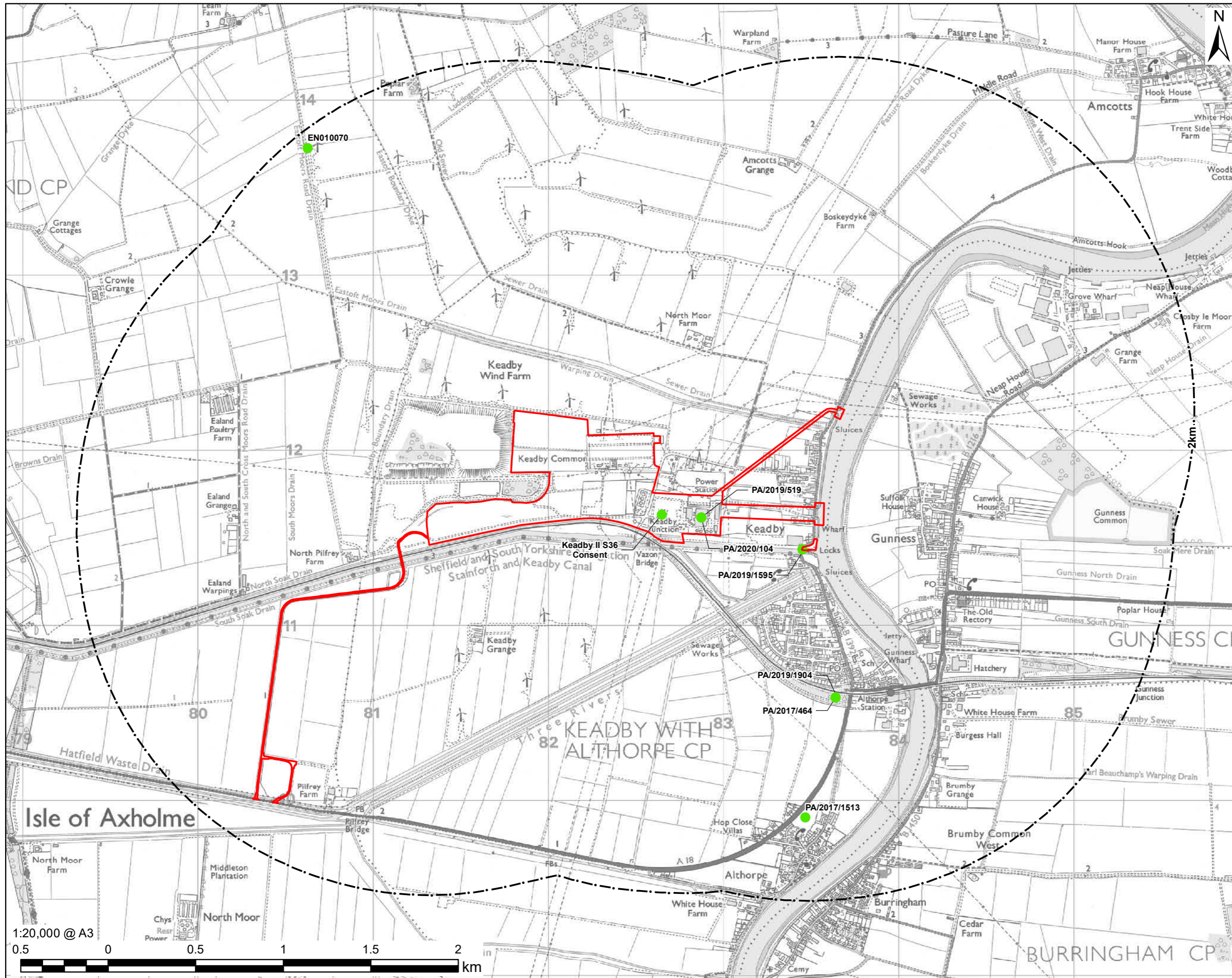
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-  Proposed Development Site
-  Study Area
-  Planning Application

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Revision: 01  
Drawn: JW Checked: CN Approved: RW Date: 05/05/2020