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**VPI IMMINGHAM PILOT CARBON
CAPTURE PLANT**

**VPI CHP PLANT, LAND AT ROSPER ROAD,
IMMINGHAM, DN40 3DZ**

**PLANNING, DESIGN AND ACCESS
STATEMENT**

Date: August 2022

Ref: 15862

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1.0 INTRODUCTION

Overview

- 1.1 This Planning, Design and Access Statement ('PDAS') has been prepared in support of an application for full planning permission submitted to North Lincolnshire Council (the 'Council') under the provisions of the Town and Country Planning Act 1990 (as amended) on behalf of VPI Immingham LLP (the 'Applicant').
- 1.2 The proposal comprises the construction and operation of a pilot post-combustion carbon capture plant ('CCP') and associated infrastructure, at the VPI Immingham Combined Heat and Power (CHP) Plant. The proposal is referred to as the 'Proposed Development' and the project is known as 'VPI Pilot Plant'.
- 1.3 The Proposed Development will demonstrate the carbon capture technology ahead of the construction of a full scale carbon capture plant at the VPI CHP Plant as part of the Humber Zero Project.

The Humber Zero Project

- 1.4 By 2050, the UK has committed to reducing carbon emissions to net zero. This can only be achieved by decarbonising existing industry effectively. Energy intensive industries account for more than 20% of the economy and 1 in 10 jobs in the Humber. Humber Zero is a project to reduce carbon dioxide (CO₂) emissions and create a low carbon future for the Humber's industry. Humber Zero aims to remove up to 8 million tonnes (Mt) of CO₂ annually.
- 1.5 Humber Zero incorporates a cluster of energy-intensive industries that lie 1 kilometre (km) from the coastline on the south bank of the River Humber. These industries are also close to offshore gas storage fields and sit within close proximity to two proposed CO₂ transport and storage networks (the Humber Low Carbon Pipelines Project and the V Net Zero Project).
- 1.6 Further information is available on the Humber Zero website, available at: <https://www.humberzero.co.uk/>
- 1.7 Full-scale post-combustion carbon capture developments at VPI Immingham's CHP plant and Phillips 66 Limited's Humber Refinery will comprise the first phase of the Humber Zero project. By 2028, these developments aim to remove up to 3.8 Mt of CO₂ annually by capturing carbon from the Humber Refinery's Fluid Catalytic Cracker ('FCC') stack and two of the gas turbines and auxiliary boilers at the VPI Immingham CHP Plant.

The VPI Immingham's CHP Plant

- 1.8 VPI Immingham's CHP Plant was constructed in two phases, and supplies:
- Heat (in the form of steam) to the two adjacent oil refineries (including Phillips 66 Limited's Humber Refinery); and
 - Electrical power to the adjacent oil refinery and the National Grid Electricity Transmission System.
- 1.9 The first phase, commissioned in 2004, comprised the installation of two gas turbines (GT1 and GT2), each with associated heat recovery steam generators (HRSG1 and HRSG2) and steam turbines (ST1 and ST2). The first phase also comprised the installation of two auxiliary boilers (AB1 and AB2) to provide back-up heat (steam) supplies.
- 1.10 The second phase, commissioned in 2009, comprised the installation of an additional gas turbine (GT3), with an associated heat recovery steam generator (HRSG3) and steam turbine (ST3).
- 1.11 Natural gas is the primary fuel of the CHP Plant.

Overview of the Proposed Development

- 1.12 The Proposed Development comprises a pilot post-combustion carbon capture plant at VPI Immingham's CHP plant, to inform the first phase of the Humber Zero Project.
- 1.13 The Proposed Development's objectives are to de-risk the full-scale post combustion carbon capture development at VPI Immingham's CHP Plant by establishing the key design and operating parameters that can be achieved, including:
- CO₂ capture performance/ rate;
 - End CO₂ purity;
 - Energy demand;
 - Emissions to air and water;
 - Solvent degradation rate; and
 - Associated corrosion and fouling rates.
- 1.14 Section 3 presents further information on the Proposed Development's characteristics.

Environmental Impact Assessment

1.15 The Applicant submitted a request for an Environmental Impact Assessment ('EIA') Screening Opinion to the Council on 9 June 2022. The Council issued its Screening Opinion on 6 July 2022, which confirmed that EIA is not required for the Proposed Development.

Planning Application Submission

1.16 The planning application submission consists of the following documents:

- Cover Letter.
- Application forms and certificates.
- Site Location Plan Ref. 60668866-ACM-EGN-Z-DR-LE-0001 – 1:10,000 at A3.
- Application Site Boundary Plan Ref. 60668866-ACM-EGN-Z-DR-LE-0002 – 1:2,500 at A3.
- Parts of the Site Plan Ref. 60668866-ACM-EGN-Z-DR-LE-0003 – 1:2,500 at A3.
- Pilot Carbon Capture Plant Plan Ref. 60668866-ACM-EGN-Z-DR-LE-0004 – 1:500 at A3.
- Emissions Monitoring Equipment Cabin Floor Plan and Roof Plan ref. 60668866-ACM-EGN-Z-DR-LE-0005 – 1:50 at A3.
- Containerised Carbon Capture Plant and Blower Elevations Plan Ref. 22C003-SMI-00-N-XG-00001 Rev 02 – 1:100 at A1.
- Planning, Design and Access Statement ('PDAS') (this document) - DWD
- Air Quality Statement - AECOM
- Noise Assessment - AECOM
- Flood Risk and Drainage Statement - AECOM
- Ecological Assessment - ESL

The Purpose and Structure of the PDAS

1.17 The PDAS demonstrates how the design of the Proposed Development is a suitable response to the Site and its setting, and that it can be adequately accessed. It also sets out how the Applicant has taken account of relevant planning policy and the extent to which the Proposed Development is compliant with the statutory Development Plan.

1.18 The PDAS draws upon and cross-refers, where relevant, to the other documents that form part of the planning application submission.

1.19 The PDAS has been prepared in accordance with Article 9 of the Town and Country Planning (Development Management Procedure) (England) Order 2015. This confirms that a ‘design and access statement’ should:

- explain the design principles and concepts that have been applied to the development;
- demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account;
- explain the policy adopted as to access, and how policies relating to access in relevant local development documents have been taken into account;
- state what, if any, consultation has been undertaken on issues relating to access to the development and what account has been taken of the outcome of any such consultation; and
- explain how any specific issues which might affect access to the development have been addressed.

Structure

1.20 The remainder of the PDAS is structured as follows:

- Section 2: describes the site and its key features, the planning history of relevance that relates to it, any local planning designations and allocations that apply.
- Section 3: provides an overview of the Proposed Development, including use, amount, layout, appearance and access.
- Section 4: outlines the need for the development in this location, and carbon capture technology in general.
- Section 5: provides the design and access details of the Proposed Development, including layout, use, amount, scale, appearance, access and landscaping.
- Section 6: sets out the legislative and policy framework for the determination of the planning application.
- Section 7: provides an assessment of the Proposed Development against relevant policy at national and local levels.
- Section 8: sets out the conclusions of this PDAS in terms of the overall acceptability of the Proposed Development.

2.0 THE SITE AND SURROUNDING AREA

2.1 This section describes the location and key features of the Site and surrounding area, identifies any relevant planning and environmental designations, and explains the Applicant's site selection process.

Site Location, Description and Use

2.1 The VPI Immingham CHP Plant ('The CHP Plant') is located immediately to the west of Rosper Road, the primary vehicular access. The CHP Plant's location is shown on Drawing Ref. 60668866-ACM-EGN-Z-DR-LE-0001 and **Figure 2.1** below.

Figure 2.1 Site location



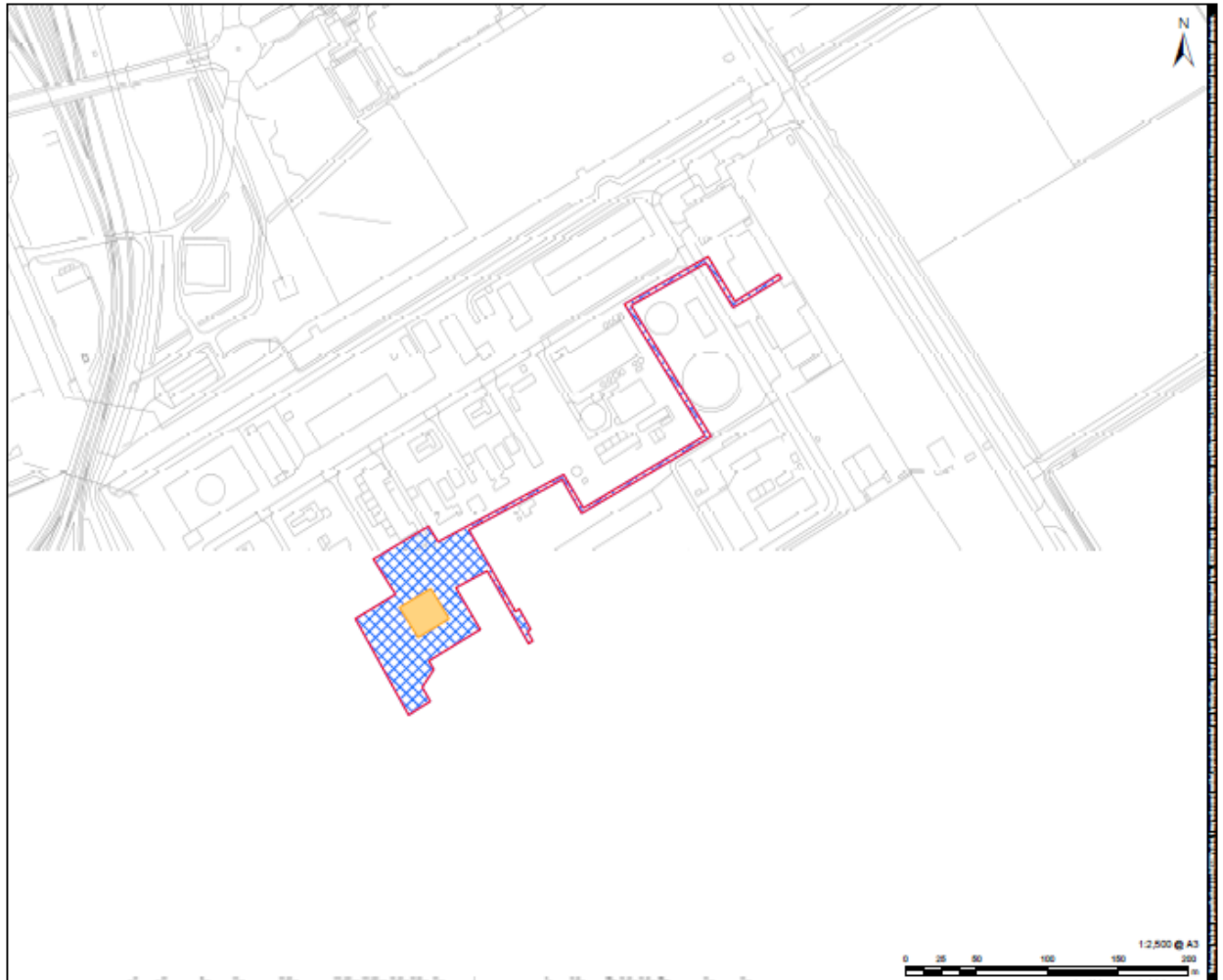
2.2 The Lindsey Oil Refinery is immediately north west and Humber Refinery immediately south west bisected by a railway line. Immingham Dock is approximately 1.5km to the south east of the CHP Plant at its closest point. The Humber port is located approximately 980m north at its closest point. The nearest settlement is the town of Immingham is located approximately 2.5km south east of the

Power Station and the nearest residential property is a single property on Marsh Lane located approximately 700m to the east.

- 2.3 The land to the north is the site of the proposed VPI Immingham Open Cycle Gas Turbine ('OCGT') Power Station (also known as VPI Energy Park 'B'), which was granted development consent on 7 August 2020. In 2018 planning permission was granted on land to the north of and within the CHP Plant (Council application reference. PA/2018/918) for the construction of a gas fired power station with a gross electrical output of up to 49.9 megawatts (known as VPI Immingham Energy Park 'A').
- 2.4 The CHP Plant is located entirely within the boundary of the administrative area of North Lincolnshire Council, which is a unitary authority, and near to the administrative boundary of North East Lincolnshire Council, 1km to the south.
- 2.5 The surrounding area comprises industrial and agricultural uses. In addition to the activities identified above, the land to the east of the CHP Plant on the eastern side of Rosper Road comprises agricultural fields extending approximately 1km toward the Humber Estuary before industrial activities associated with the storage and export of gas and oil and other port activities commence along the banks of the Estuary itself, approximately 1.5km from the Site at its closest point.
- 2.6 A railway spur runs north-south to the immediate west of the CHP Plant. This spur services the Lindsey Oil Refinery and joins the main line approximately 400m south west of the Site. This is the principal railway line in North East Lincolnshire and runs between Cleethorpes and Barton on Humber.
- 2.7 Site access will be via the existing CHP Plant site access on Rosper Road. Rosper Road in turn connects to Humber Road, the A160 and the A180 and from there to the motorway network.
- 2.8 The Application Site boundary encompasses 0.85 hectares of land running south west to north east through the existing operational area of the CHP Plant, adjacent to the east of GT2 and the existing stack spanning the length of the CHP Plant to its eastern edge. The application site boundary follows the route of the existing network of pipe racks as they connect into the plant on site. The Proposed Pilot Plant would occupy a rectangular area of land in the western part of the application site boundary adjacent to the east of GT2 and the existing stack. This location currently comprises hardstanding and is used for general plant storage and materials laydown which can be easily removed and redistributed across the CHP Plant. A network of internal access roads runs throughout the CHP Plant site connecting the Site to the existing primary access onto Rosper Road. Drawing Ref. 60668866-ACM-EGN-Z-DR-LE-0003 and **Figure 2.2** shows the location of the

application site boundary edged in blue within the CHP Plant and the area for the Pilot Carbon capture Plant demarcated in the yellow.

Figure 2.2 Application site boundary and Pilot Plant Location



Planning and Environmental Designations

2.9 A review of the Council’s interactive Planning Policy Map has identified the following designations on or in proximity to the Site shown in **Figure 2.3**. The Policy map for the Draft Local Plan is shown in **Figure 2.4**.

North Lincolnshire Core Strategy 2011

- Ports and wharves (CS1; CS11; CS12; CS26).
- Strategic Employment Locations (CS1; CS4; CS11; CS12; CS17; CS25; CS26).
- Area of Search for Waste Facility (CS20).
- Major Road Improvement (CS1; CS4; CS11; CS12; CS26).

Housing and Employment Land Allocations DPD 2016

- Proposed Development IN12-6.
- Site of Importance for Nature Conservation (LC4) adjacent to the east and the north.
- South Humber Bank Landscape Initiative (LC20) to the west.
- Listed Building HE-5 to the east.
- T17 highway improvement to the south.

North Lincolnshire Local Plan Stage 5 Publication Addendum

- Strategic Site Allocation: South Humber Bank (SS10).
- South Humber Bank Landscape Initiative (EC4).
- Landscape enhancement (DQE2).

Figure 2.3 North Lincolnshire Local Development Framework Proposals Map

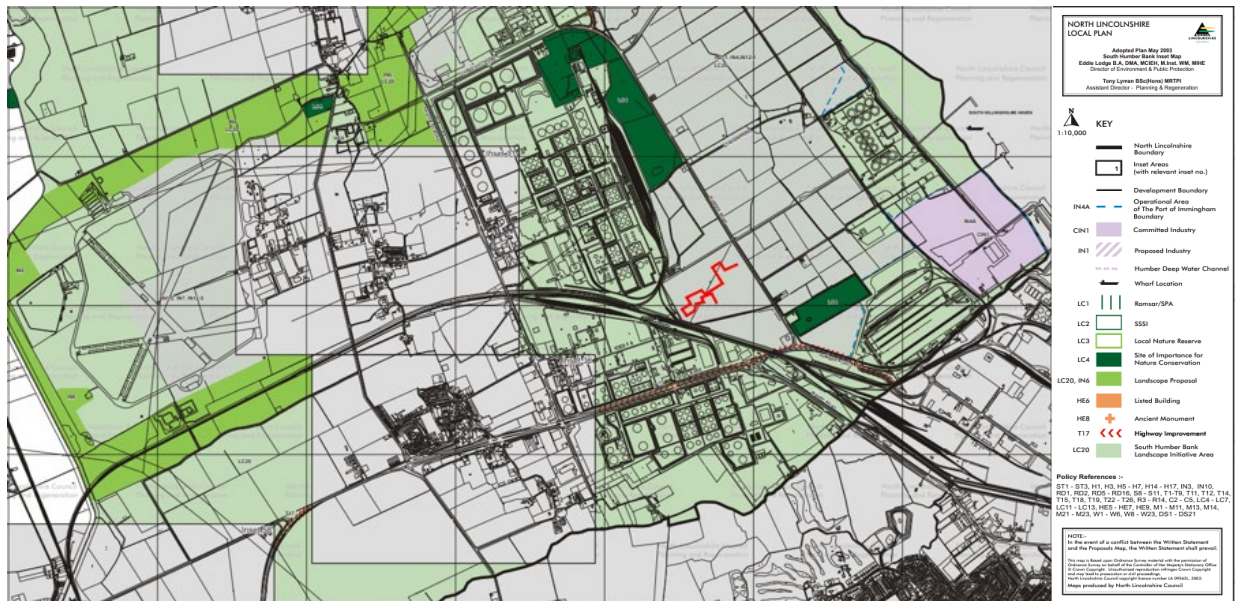
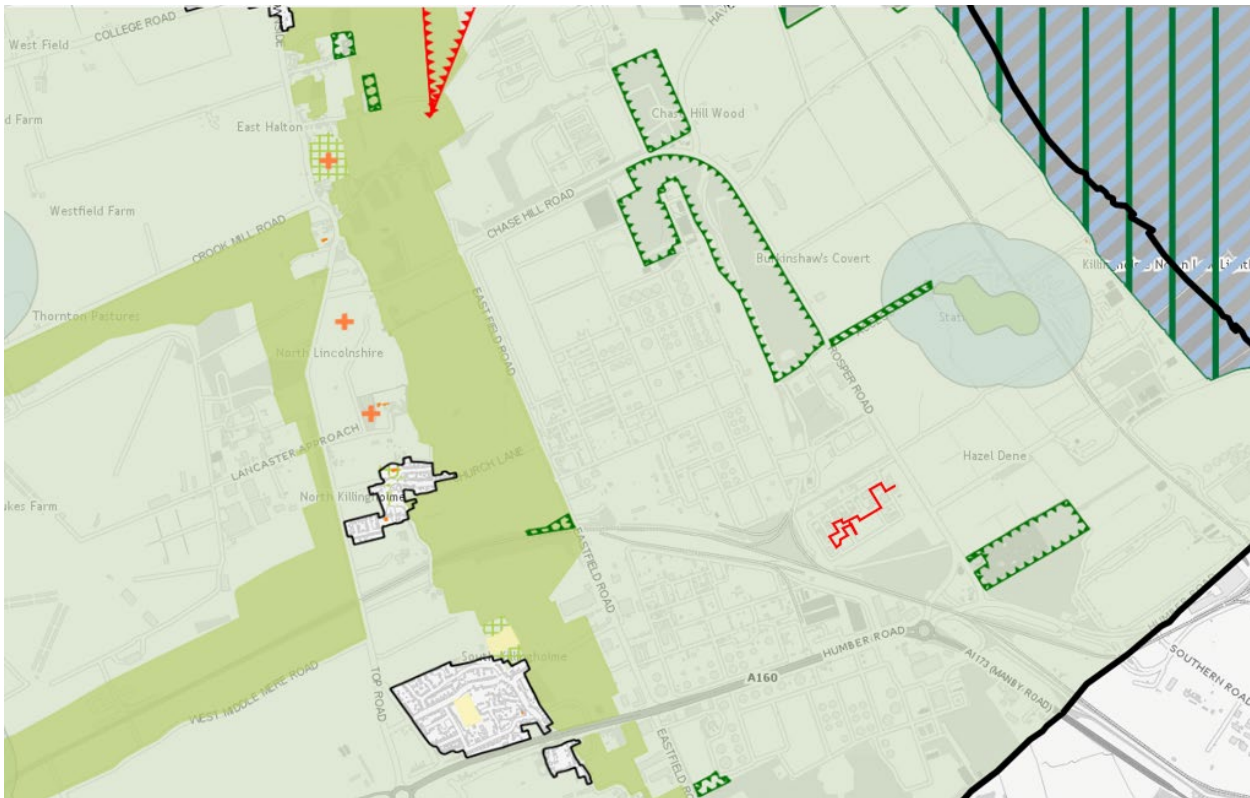


Figure 2.4 North Lincolnshire Draft Local Plan Proposals Map

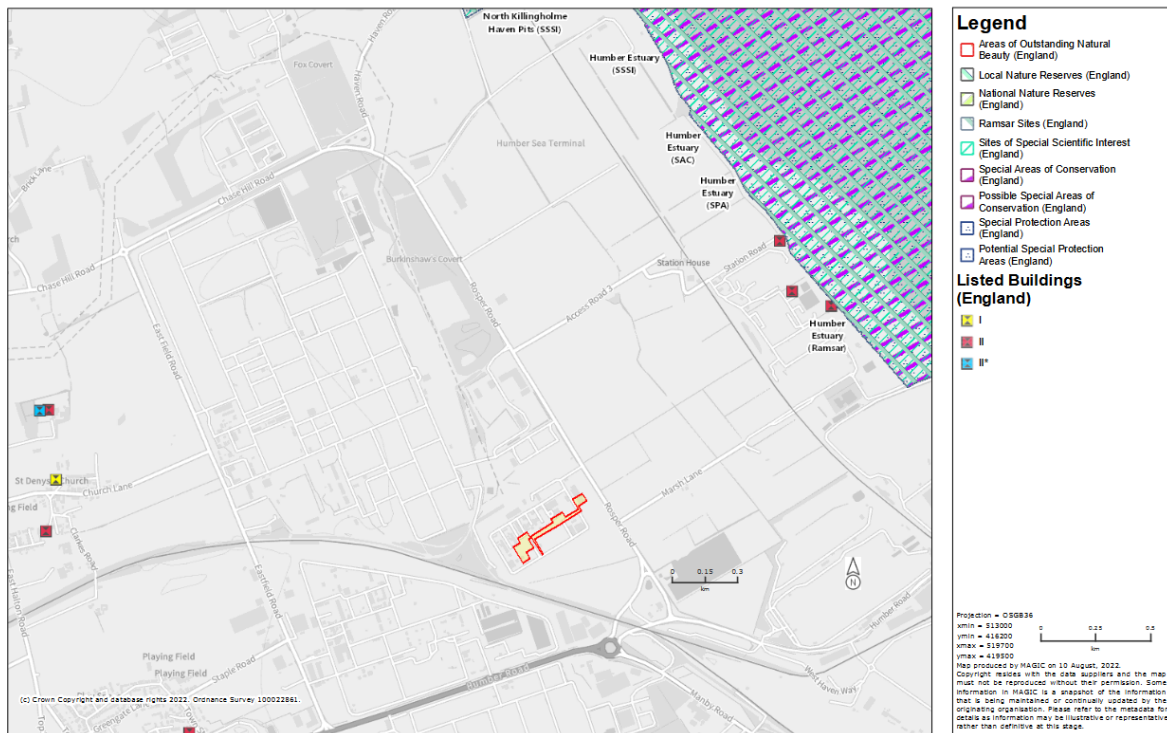


2.10 A search of the Government’s MAGIC Map database revealed that the site does not contain any environmental or heritage designations. An extract of the MAGIC Map search is provided as **Figure 2.5**.

Figure 2.5 MAGIC Map extract – environmental and heritage designations

MAGIC

MAGIC MAP SEARCH

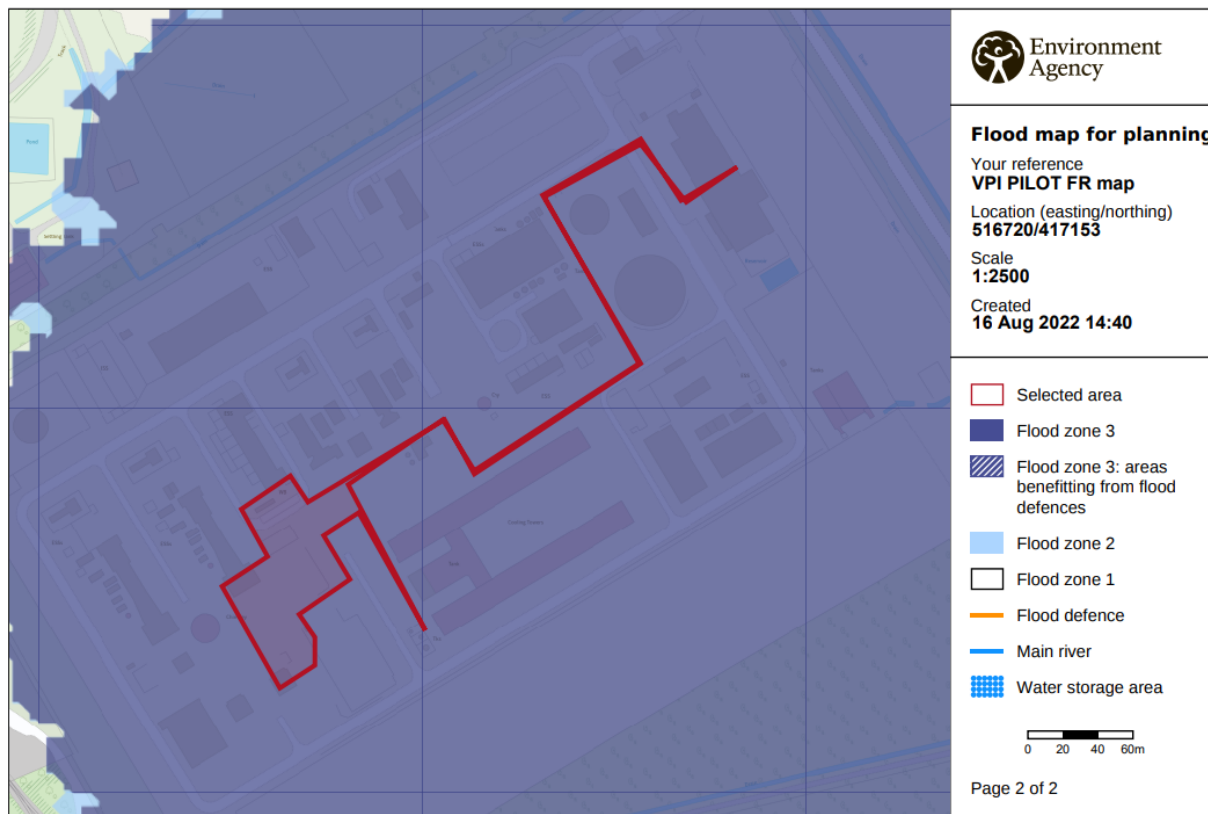


2.11 The closest Environmental designation is the Humber Estuary which is designated as a Site of Special Scientific Interest ('SSSI'), a Special Protection Area ('SPA'), a Special Area of Conservation ('SAC') and Ramsar site, lying 1.6km to the north-east.

2.12 No heritage designations have been identified within the CHP Plant site. The nearest listed buildings are three Grade 2 light houses 1.8km to the east and the Nook a Grade 2 listed building in South Killingholme, 1.6km to the west. Manor Farm Moated Site (NHLE 1008044) Scheduled Monument is approximately 2.1 km to the north-west.

2.13 A search of Environment Agency mapping shows the Site is located within Flood Zone 3 as illustrated in Figure 2.6. The red line showing in this figure is a sketch of the true application boundary.

Figure 2.6 Flood Mapping



Planning History

2.14 A search of the Council’s online planning register identified the following planning applications and records within the Site.

Table 2.1: Application Site Planning History

APPLICATION REFERENCE	PROPOSAL DESCRIPTION	DECISION
PA/1998/1544	Form B application to construct a combined heat and power generating power station	No objection 15/02/1999
PA/1999/1229	Form B application to erect a combined heat and power plant	13/11/2000
PA/2000/1467	Form B application to erect an extension to existing heat and power plant	22/03/2001
PA/2005/1884	Form B application to extend the existing combined heat and power plant to a total generation capacity of 1230 MW (proposed extension 470 MW)	22/03/2006
PA/2008/1704	Hazardous Substances Consent to store 3050 tonnes of petroleum gas oil as described under entry number Part 2 10 (ii) of Schedule 1 of the Planning (Hazardous Substances) Regulations 1992	02/02/2009
PA/SCO/2022/5	EIA scoping opinion for V Net Zero pipeline	27/04/2022

2.15 The following applications were also identified within the wider CHP Plant site boundary.

Table 2.2: CHP Plant Application History

APPLICATION REFERENCE	PROPOSAL DESCRIPTION	DECISION
PA/2009/1093	Planning permission to replace two gas turbine air inlet filter houses	Approved 16/10/2009
PA/2011/0370	Planning permission to erect office extension	Approved 26/05/2011
PA/2021/1039	Application for a non-material amendment following a grant of planning permission PA/2018/918 to amend conditions 3, 5, 6, 8, 9, 13 and 16	Approved 08/07/2021

3.0 THE PROPOSED DEVELOPMENT

3.1 This section provides a description of the Proposed Development, including its main components, construction and operation.

Development Summary

3.2 The Proposed Development comprises a pilot post-combustion carbon capture plant to inform the first phase of the Humber Zero Project. It is in effect a smaller test facility intended for the purpose of learning about carbon capture technology and its application in this site context. The knowledge obtained would be used to establish the key design and operating parameters to inform and de-risk a full-scale post-combustion carbon capture plant. The design parameters being tested for include:

- CO₂ capture performance/ rate;
- End CO₂ purity;
- Energy demand;
- Emissions to air and water;
- Solvent degradation rate; and
- Associated corrosion and fouling rates.

3.3 The Proposed Development is temporary, and will operate continuously, processing up to around 750 tonnes of CO₂ over an anticipated six month period. The Pilot Plant may however operate for up to 12 months. The Pilot Plant programme does not involve sequestration of the captured CO₂ so after processing the CO₂ will be re-released.

3.4 The Proposed Development is functionally dependent on the operation of the gas turbines and/or auxiliary boilers at the CHP Plant, which are in turn dependent on commercial drivers. Accordingly, it is possible that a longer period of pilot testing may be necessary to meet the Proposed Development's stated objectives as set out above. The Applicant therefore requests input into any planning conditions to ensure that any time limit is at least 18 months and/or provides for periodic notifying of the LPA around intended dates.

Main Components

3.5 The Proposed Development will predominately comprise storage containers, housing the carbon capture plant, plus interconnecting ductwork/ pipelines with the existing CHP Plant.

3.6 The individual elements of the Proposed Development will comprise:

- Containerised Carbon Capture Plant and Blower (utilising shipping type containers) with associated absorber and stripper columns;
- Two Standby Diesel Generators (in case of temporary power supply issues);
- Bunded Diesel Storage Tank;
- Lean Amine tank;
- Emissions Monitoring Equipment Cabin; and
- Inter-connecting ductwork/ pipework and cabling.

3.7 The Proposed Development will not include any equipment/ plant for CO₂ compression and storage. Rather, any processed side stream of flue gas and any CO₂ captured will be fed directly back into the existing stack and released to the atmosphere with the un-processed flue gas. Therefore, the Proposed Development makes use of existing emission points.

3.8 Within the Containerised Carbon Capture Plant, the main items of equipment/ plant will include a Direct Contact Cooler ('DCC'), a CO₂ absorber column and a CO₂ stripper column. In addition, there will be various heat exchangers, pumps, tanks and ancillary equipment.

3.9 **Table 3.1** presents the main equipment/ plant container dimensions.

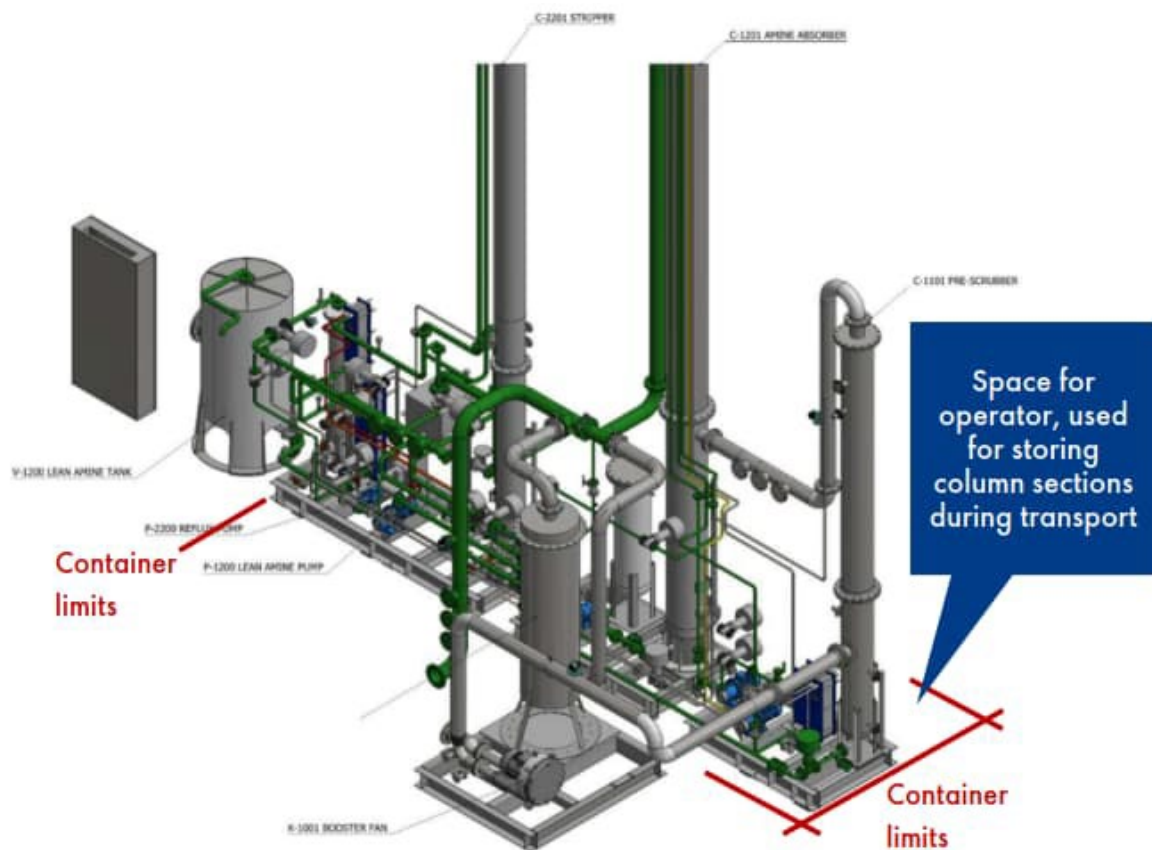
Table 3.1: Main Equipment/ Plant Container Dimensions

Component	Measurement	Approximate Dimension (m)
Containerised Carbon Capture Plant	Length	12.2
	Width	4.8
	Height	2.9
DCC	Height	6.7
CO ₂ Absorber Column	Height	18.0
CO ₂ Stripper Column	Height	30.0
Emissions Monitoring Equipment Cabin	Height	2.8
	Width	3.1
	Length	3.0
Generator Unit	Height	4.5

3.10 The Proposed Development will not require design/ structure size changes which will materially alter the overall appearance of the existing CHP Plant. **Figure 3.1** presents a visualisation of the inside of the main equipment/ plant container. Drawing ref. 22C003-SMI-00-N-XG-00001 shows the elevations of the containerised carbon capture plant.

3.11 The carbon capture pilot plant will require an electricity supply which will be provided via a direct connection to the VPI Immingham CHP Plant. In addition temporary diesel generation is included for backup purposes to avoid interruptions to the pilot operation in the event of a CHP Plant outage or other interruption to supply (twin 300 kVA diesel generators, one running and one on standby). A bunded diesel storage tank is also included.

Figure 3.1 Visualisation of the inside of the Containerised Carbon Capture Plant



3.12 The Containerised Carbon Capture Plant will be positioned on the existing concrete base. An assessment of the existing concrete base to determine its condition and suitability to support the Proposed Development components will be carried out prior to installation. If required, suitable reinforcement prior to the main equipment/ plant container installation.

3.13 The Proposed Development will be a temporary facility (operating between six and 12 months), designed to process up to 4 tonnes (t) of CO₂ daily, and will be designed to operate continuously 24 hours a day, 7 days a week. The Proposed Development will process a total of up to approximately 750 t of CO₂ over a six month period.

Construction

3.14 Construction activities will comprise:

Preparation works

- Tie-in point installation.
- Ground and site preparation.
- Cable routing.
- Piping routing and supports.

Pilot plant laydown and tie-in works

- Pilot plant setting down and securing.
- On-site pilot plant hook-ups and construction activities (e.g. assembling the stacks and hooking up the blower).
- Supporting elevated structures (e.g. columns using guy wires).
- Tie-ins for Piping/ ducting, Power cabling and communication cabling.
- Completion and commissioning.

3.15 The installation preparation works will take approximately 2-3 weeks to complete, and the pilot plant laydown and tie-in works will take place over a period of around 10-11 weeks, with the overall installation period taking approximately 13 weeks to complete. Work will not be continuous through this period – the 13 week duration is driven by the need to limit disruption to the operation of the CHP Plant.

Operation

3.16 The following provides a brief overview of the operation of the pilot plant.

- The slipstreamed hot CO₂-rich flue gases will be passed through a Direct Contact Cooler ('DCC') within the pilot plant to be cooled (using cooling water from the existing CHP Plant cooling water system) from approximately 90°C to <40°C.
- The cooled CO₂-rich flue gases will be passed through the CO₂ absorber column where the CO₂ will be removed from the flue gases via contact with the amine solvent. Within the CO₂ absorber column, the CO₂-rich flue gases will flow up through the packing beds, and the amine solvent will flow down, to ensure good contact efficiency.

- The CO₂-lean flue gases will be passed through a wash section at the exit/ top of the CO₂ absorber column, where entrained amine solvent will be removed in order to minimise carry-over. However, following treatment, the CO₂-lean flue gases will contain very small amount of residual amine solvent.
- Subsequently, the CO₂-lean flue gases will exit the top of the CO₂ absorber column, returned to the GT2 ducting, and vented via the existing 90 m stack. Although the temperature of the CO₂-lean flue gases will be lower than the unprocessed flue gases, the overall temperature change in the stack will be insignificant due to the small quantity of CO₂-lean flue gases returning.
- The CO₂-rich solvent stream will be heated in a heat exchanger and passed through the CO₂ stripper column, where the CO₂ will be removed from the amine solvent via contact with steam (the heat from the stream breaks the CO₂ to amine solvent bond). Within the CO₂ stripper column, the CO₂-rich solvent stream will flow down through the column, and the steam will flow up. There will also be a reflux section at the top of the CO₂ stripper column to maximise CO₂-amine solvent separation.
- The CO₂-lean solvent stream will be pumped from the bottom of the CO₂ stripper column, cooled in the heat exchanger and then further cooled before re-entry into the CO₂ absorber column.
- Subsequently, the CO₂ gas will exit the top of the CO₂ stripper column, and be returned to the main GT1/ GT2 ducting, and vented via the existing 90 m stack. Again, although the temperature of the CO₂ gas will be lower than the unprocessed flue gases, the overall temperature change in the stack will be insignificant due to the small quantity of CO₂ gas returning.

Decommissioning

3.17 Following completion of the pilot plant trial, envisaged to be between six and 12 months in duration, the Proposed Development will be decommissioned and removed from the Site. However, as noted above Pilot Plant testing is dependent on commercial drivers and a longer period of pilot testing may be necessary. As noted above an extension may be required depending on the commercial operation patterns of the CHP Plant. It is envisaged that the Pilot Plant will be decommissioned and removed within 18 months of its first operation.

4.0 NEED FOR THE DEVELOPMENT

- 4.1 The UK has legislated to reducing carbon emissions to net zero by 2050. This can only be achieved by decarbonising existing industry effectively.
- 4.2 The Energy White Paper: Powering our Net Zero Future (HM Government, 2020) (the ‘EWP’) confirms the Government’s support for Carbon Capture Usage and Storage (‘CCUS’) drawing upon the resource provided by the North Sea) and new hydrogen technologies. The Government estimates (Introduction, page 15) that the measures in the EWP could reduce emissions across power, industry and buildings by up to 230 million tonnes of carbon dioxide (Mt CO₂e) in the period to 2032 and enable further savings in other sectors such as transport. In doing so, these measures could support up to 220,000 jobs per year by 2030. These figures include the energy measures from the Ten Point Plan as well as additional measures set out in the EWP. However, the EWP recognises that more will need to be done to meet key milestones on the journey to Net Zero. The Government’s key policies and commitments to put the UK on the course to Net Zero are grouped under headings including ‘Transform Energy’, ‘Support a Green Recovery from Covid-19’ and ‘Creating a Fair Deal for Consumers’.
- 4.3 Chapter 2 of the EWP deals with ‘Power’ with the stated goal being to use electricity to enable the transition away from fossil fuels and decarbonise the economy cost-effectively by 2050. Due to increases in electricity demand a four-fold increase in clean electricity generation is required alongside the decarbonisation of electricity. The EWP states that the Government is not targeting a particular generation mix by 2050 and its view remains that the electricity market should determine the best solutions for very low emissions and reliable supply, at a low cost to consumers/ While the EWP (page 43) states that a low-cost, net zero consistent system is likely to be composed predominantly of wind and solar, in order to ensure the system is reliable, it needs to be complemented by technologies which provide power, or reduce demand, when the wind is not blowing, or the sun does not shine. This includes gas with CCS and short-term dispatchable generation providing peaking capacity. The EWP (page 47) recognises that:
- “In the power sector, gas-fired generation with CCUS can provide flexible, low-carbon capacity to complement high levels of renewables. These characteristics mean that deployment of power CCUS projects will play a key role in the decarbonisation of the electricity system at low cost.”*
- 4.4 The challenge of decarbonising industry is covered at Chapter 5 ‘Industrial energy’ of the EWP, in particular, the need for emissions from industry to fall by around 90% from today’s levels by 2050 if the Net Zero target is to be met (page 118). The EWP (page 120) highlights how about half of all

emissions from manufacturing and refining are concentrated in the UK's major industrial clusters (EWP Figure 8.1). These 'hubs' are seen as critical drivers of local and regional economic activity and a vital component of the UK's national economy. It goes on to state (page 122):

"Improved efficiency in the energy performance of buildings and industrial processes will lay the groundwork for the transformation of industrial energy. But we cannot rely on energy efficiency alone to reduce emissions in line with our 2050 goal. Manufacturing industry will need to capture their carbon for onward storage and switch from using fossil fuels to low-carbon alternatives."

- 4.5 The EWP notes (page 124) that many clusters are located in regions in need of economic revitalisation and that decarbonising those clusters can act as a driver of prosperity for the surrounding areas. Furthermore, that investments in key technologies like CCUS will be crucial to enhancing local economic growth and creating jobs together with prosperity.
- 4.6 The EWP confirms that the deployment of CCUS is fundamental to the decarbonisation of energy intensive industries such as steel, cement, oil refining and chemicals. It highlights the role of CCUS in helping to secure the long-term future of these industries and enabling the production of low-carbon hydrogen at scale. It stresses how the UK is in a strong position to become a global technology leader in CCUS, with the potential to store 78 billion tonnes of carbon dioxide. It recognises that deployment of CCUS could create new markets for UK businesses, at home and abroad, as other countries look to meet their emissions reduction commitments and could support 50,000 jobs in the UK by 2030.
- 4.7 The UK Government's Net Zero Strategy (2021) expands on key commitments in the Energy White Paper, proposing to deliver "four carbon capture usage and storage (CCUS) clusters, capturing 20-30 MtCO₂ across the economy, including 6 Mt CO₂ of industrial emissions, per year by 2030". This comprises 6 Mt CO₂ per year to be captured from industrial emissions, implying a commitment of between 14-24 MtCO₂ per year to be captured from energy sources. Energy intensive industries account for more than 20% of the economy and 1 in 10 jobs in the Humber.
- 4.8 More recently, the Government released the British Energy Security Strategy (2022) which seeks to set out "how Great Britain will accelerate homegrown power for greater energy independence." The report supports the objective for low carbon emissions, and is committed to investing in CCUS by providing £1 billion in public investment to decarbonise our industrial clusters.

5.0 DESIGN COMPONENTS

5.1 This section describes the key design components of the Proposed Development including, the quantum, layout, scale, appearance and access.

Use

5.2 The proposed use of the Site would be for the operation of a temporary pilot post-combustion carbon capture facility, comprising the main carbon capture plant and ancillary plant integrated into the existing CHP Plant.

5.3 The Proposed Development is consistent with the existing use of the CHP Plant and will not alter the generation of electricity or any other processes on site. The Pilot Plant will improve the understanding of carbon capture in order to de-risk a subsequent full-scale post combustion carbon capture plant for the CHP Plant, as part of the wider Humber Zero Project. The Proposed Development will be temporary and subsequently removed at which point the Site would have returned to its previous state.

5.4 The Proposed Development will be integrated into and collocated with the existing CHP Plant infrastructure and has a similar function and technical design. It is therefore considered that it is highly compatible with the existing use of the Site and its industrial surroundings.

Amount

5.5 Buildings and structures will occupy less than 50% of the total area of the 0.85ha site and consist of the following:

- Containerised Carbon Capture Plant and Blower (utilising shipping type containers) with associated absorber and stripper columns;
- Two Diesel Generators (one in use and one standby);
- Lean Amine tank;
- Small Control Room Cabin;
- Bunded Diesel Storage Tank; and
- Inter-connecting ductwork/ pipework and cabling.

5.6 The existing hardstanding requires little preparation. The amount of development is similarly minimal, limited to installation and removal of the Pilot Plant.

Layout

5.7 The Site is set well within the existing CHP Plant site surrounded by plant and equipment on all sides. The Site is flat and free from physical constraints. Accordingly the site layout is functional, driven by safety and technical requirements such as the need to connect into the existing gas turbine and auxiliary boiler systems. The site layout is considered to be appropriate to its surroundings.

Scale

5.8 The scale of development has been determined by technical requirements. The highest structures are the stripper column (29m) and the absorber column (18m). Development at this height, particularly columns, are common at the CHP Plant and the refineries to the north, with the existing gas turbine stack (90m) being the CHP Plant's most prominent visual feature. The stripper and absorber columns are much smaller and will not be discernible from the existing chimneys and stocks. The Containerised Pilot Carbon Capture Plant and Blower and control cabin will be contained in shipping type containers for ease of transportation, and overshadowed by the existing large and bulky buildings surrounding the site such as the air condensers and turbine halls. Accordingly, the scale of development proposed is consistent with the existing CHP Plant.

Appearance

5.9 The visual appearance of the Proposed Development is characterised by storage containers, industrial plant, columns and ductwork as illustrated by Figure 3-1. The choice of materials and textures for the Pilot Plant is industrial and functional. The appearance of the Proposed Development is driven by functionality along with efficiency of transportation. This design approach is entirely consistent with the visual appearance of the existing CHP Plant.

Access

5.10 The existing CHP Plant access will be utilised for construction and operation. Most vehicles would enter the Site from the south via Rosper Road and the A180. The access currently serves the existing CHP Plant and is able to accommodate the largest vehicle expected on Site and is therefore considered adequate for the Proposed Development. The CHP Plant is served by a network of internal access roads which vehicles would be used to access the Site.

6.0 PLANNING POLICY CONTEXT

6.1 This section provides a brief overview of the relevant planning policy and guidance at the local and national level. The Proposed Development has been influenced by these policies and is assessed against at Section 7 of the PDAS.

6.2 The planning application would be determined in accordance with section 70(2) of the Town and Country Planning Act 1990 (as amended), which states that in dealing with applications, local planning authorities shall have regard to the provisions of the statutory development plan and to other material considerations.

Statutory Development Plan

6.3 The Site is located within North Lincolnshire Council ('NLC'). The following planning policy documents are considered most relevant to the proposed Development:

- North Lincolnshire Core Strategy (Adopted June 2011).
- North Lincolnshire Local Plan (Adopted May 2003) – Saved Policies.
- North Lincolnshire Housing and Employment Land Allocations Development Plan Document (Adopted March 2016).

6.4 The following policies are considered of most relevance:

Core Strategy (2011)

6.5 Policy CS1: Spatial Strategy for North Lincolnshire sets out the overarching spatial strategy for growth with one of the key focuses being:

“part d) Supporting the development of key strategic employment sites at the South Humber Bank, Humberside Airport and Sandtoft Airfield.”

6.6 Specifically, this involves:

“The development of the nationally important South Humber Bank ports will be supported by safeguarding around 900ha of land in and around the port complexes for estuary related development as well as to support the continued growth of the chemical and renewable energy industries.”

6.7 Policy CS1 concludes with an overarching objective for:

“All future growth regardless of location should contribute to sustainable development in particular in respect of those criteria set out in policy CS2 as well as the other policies of the plan. All change

will be managed in an environmentally sustainable way by avoiding/minimising or mitigating development pressure on the area's natural and built environment, its existing utilities and associated infrastructure and areas at risk of flooding."

6.8 The implementation of Policy CS1 is supported by Policy CS2 which directs development to the most sustainable locations using a sequential approach.

"Any development that takes place outside the defined development limits of settlements or in rural settlements in the countryside will be restricted. Only development which is essential to the functioning of the countryside will be allowed to take place. This might include uses such as that related to agriculture, forestry or other uses which require a countryside location or which will contribute to the sustainable development of the tourist industry.

A 'sequential approach' will also be applied to ensure that development is, where possible, directed to those to those areas that have the lowest probability of flooding, taking account the vulnerability of the type of development proposed, its contribution to creating sustainable communities and achieving the sustainable development objectives of the plan. Where development does take place in the flood plain, mitigation measures should be applied to ensure that the development is safe.

All future development in North Lincolnshire will be required to contribute towards achieving sustainable development. Proposals should comply with the overall spatial strategy together with the following sustainable development principles:

- Be located to minimise the need to travel and to encourage any journeys that remain necessary to be possible by walking, cycling and public transport. It should be compliant with public transport accessibility criteria as set out in the Regional Spatial Strategy*
- Be located where it can make the best use of existing transport infrastructure and capacity, as well as taking account of capacity constraints and deliverable transport improvements particularly in relation to junctions on the Strategic Road Network*
- Where large freight movements are involved the use of rail and water transport should be maximised*
- Contribute towards to the creation of locally distinctive, sustainable, inclusive, healthy and vibrant communities*
- Contribute to achieving sustainable economic development to support a competitive business and industrial sector*

- *Ensure that everyone has access to health, education, jobs, shops, leisure and other community and cultural facilities that they need for their daily lives*
- *Ensure the appropriate provision of services, facilities and infrastructure to meet the needs of the development, but where appropriate it is to be recognised that a phased approach may not be required on small scale development proposals.*
- *To be constructed and operated using a minimum amount of non-renewable resources including increasing the use of renewable energy in construction and operation*
- *Take account of local environmental capacity and to improve air, water and soil quality and minimise the risk and hazards associated with flooding, and*
- *Be designed to a high standard, consistent with policy CS5, and use sustainable construction and design techniques.”*

6.9 Policy CS5 sets out the policy for achieving good design and states:

“All new development in North Lincolnshire should be well designed and appropriate for their context. It should contribute to creating a sense of place. The council will encourage contemporary design, provided that it is appropriate for its location and is informed by its surrounding context. Design which is inappropriate to the local area or fails to maximise opportunities for improving the character and quality of the area will not be acceptable.

- *Incorporate the principles of sustainable development throughout the whole design process. This will include site layout, minimising energy consumption, maximising use of on-site renewable forms of energy whilst mitigating against the impacts of climate change; for instance flood risk.*
- *Create safe and secure environments, which reduce the opportunities for crime and increase the sense of security for local residents through the use of Secured by Design guidance.”*

6.10 Policy CS11 sets out the Council’s support for the for the expansion and improvement of its employment land. The general provisions of this policy state that the Council will support development elsewhere (outside the four broad strategic employment locations) within North Lincolnshire that meet local employment needs and maximises other special locations.

6.11 Policy CS12 sets out the approach for fortifying and improving the South Humber bank Strategic Employment Site (SHBSES) and describes its economic importance to North Lincolnshire and the wider region.

6.12 Policy CS18 aims to reduce the size of North Lincolnshire’s ecological footprint, reduce the causes of climate change, and move North Lincolnshire towards a more resource efficient future. The policy consists of 13 parts and states that the Council will promote development that utilises natural resources as efficiently and sustainably as possible. This will include, inter alia:

“10. Ensuring development and land use helps to protect people and the environment from unsafe, unhealthy and polluted environments, by protecting and improving the quality of the air, land and water.

4. Meeting required national reductions of predicted CO2 emissions by at least 34% in 2020 and 80% in 2050 by applying the following measures on development proposals. Requiring all industrial and commercial premises greater than 1000 square metres to provide 20% of their expected energy demand from on site renewable energy until the code for such buildings is applied nationally. Where developers consider these Codes and targets cannot be met on the basis of viability they will be required to provide proof through open book discussions with the council at the planning application stage.

12. Supporting new technology and development for carbon capture and the best available clean and efficient energy technology, particularly in relation to the heavy industrial users in North Lincolnshire, to help reduce CO2 emissions.”

6.13 Policy CS19 Flood Risk states:

The council will support development proposals that avoid areas of current or future flood risk, and which do not increase the risk of flooding elsewhere. This will involve a risk based sequential approach to determine the suitability of land for development that uses the principle of locating development, where possible, on land that has a lower flood risk, and relates land use to its vulnerability to flood. Development in areas of high flood risk will only be permitted where it meets the following prerequisites:

- 1. It can be demonstrated that the development provides wider sustainability benefits to the community and the area that outweigh flood risk.*
- 2. The development should be on previously used land. If not, there must be no reasonable alternative developable sites on previously developed land.*
- 3. A flood risk assessment has demonstrated that the development will be safe, without increasing flood risk elsewhere by integrating water management methods into development.*

6.14 Within the final paragraph, the policy notes that the Council will also seek to reduce the increase in flood risk due to climate change through measures to reduce carbon dioxide.

6.15 Policy CS20: Sustainable waste Management states that the Council will promote sustainable waste management by

- *Requiring the integration of facilities for waste minimisation, re-use, recycling and composting, in association with the planning, construction and occupation of new development.*

6.16 Policy CS25: Promoting Sustainable Transport seeks to ensure that development proposals provide high quality and sustainable transport arrangements and contains a range of transport network and demand management tools.

[North Lincolnshire Local Plan \(Adopted May 2003\) - Saved Policies](#)

6.17 There are many policies from the north Lincolnshire Local Plan (2003) that have been ‘saved’ and continue to inform planning policy and decision making.

6.18 Policy IN1 - Industrial Development Location and Uses identifies the South Humber Bank as an area of 740.7 ha for Estuary related B1, B2, B8 uses.

6.19 Policy T2 Access to Development states that:

“All development must be provided with a satisfactory access. In larger developments it should be served adequately by:

- being readily accessible by a choice of transport modes; and*
 - existing public transport services and infrastructure; or*
 - additions or extensions to such services linked directly to the development; and*
- i) the existing highway network.”*

6.20 Policy DS1 – General Requirements states *“A high standard of design is expected in all developments in both built-up areas and the countryside and proposals for poorly designed development will be refused.”*

6.21 Policy DS6 Temporary Buildings states:

“Planning permission will be granted for temporary buildings provided the following criteria are met:

- i) the building is not highly visible to the general public or detrimental to the amenity of the area/landscape; and*
- ii) the development will not prejudice proposals for permanent development on the site.*

In granting planning permission for temporary buildings, conditions may be imposed requiring the landscaping of the development or other measures to help mitigate its impact on the visual amenity of the area.

A time limited (temporary) planning permission will be granted for non-permanent structures in cases where a permanent permission would prejudice future development of the site.”

6.22 DS11 – Polluting Activities states:

“Planning permission for development, including extensions to existing premises and changes of use, will only be permitted where it can be demonstrated that the levels of potentially polluting emissions, including effluent, leachates, smoke, fumes, gases, dust, steam, smell or noise do not pose a danger by way of toxic release; result in land contamination; pose a threat to current and future surface or underground water resources; or create adverse environmental conditions likely to affect nearby developments and adjacent areas.”

6.23 DS16 - Flood Risk has a similar purpose to Core Strategy Policy CS19 and states:

“Development will not be permitted within floodplains where it would:

- i) increase the number of people or buildings at risk; or*
- ii) impede the flow of floodwater; or*
- iii) impede access for the future maintenance of watercourses; or*
- iv) reduce the storage capacity of the floodplain; or*
- v) increase the risk of flooding elsewhere; or*
- vi) undermine the integrity of existing flood defences.”*

[Housing and Employment Land Allocations Development Plan \(2016\)](#)

6.24 The Housing and Employment Land Allocations (‘HELA’) Development Plan Document (‘DPD’) sets out which sites the Council has allocated for future housing development and where new employment opportunities will be located.

6.25 The Site falls within Employment Land Allocation SHBE-1 ‘South Humber Bank’, a 900 hectare site allocation of land along the Humber coast. Policy SHBE-1 is allocated as a strategic site for port

activities to take special advantage of its location, adjacent to a deep water channel of the River Humber as an extension to Immingham Port and Humber Sea Terminal. This employment site is a major part of the South Humber Gateway which forms a four mile area fronting the Humber estuary. Most of the site specific development criteria contained in Policy SHBE-1 are applicable only to greenfield developments of a permanent nature and that are closer than the proposed development to the internationally designated sites along the Humber coast. The following site specific criteria are considered relevant to the proposed development :

- *“Development of the site shall only take place if there has been appropriate consideration given to the international, national and local protected sites for nature conservation. This includes complying with the tests of the European Habitats Regulations (Birds and Habitat Directives).*
- *An ecological assessment will be required.*
- *Pollution and waste control measures should be implemented wherever practical and relevant to the proposed development.*
- *Use of materials and development works shall be sensitive to the location.*
- *A structural landscape scheme is required as a buffer to limit the visual impact of development and improve the amenity of nearby communities between the western edge of the employment site and the villages of South Killingholme, North Killingholme and East Halton.*
- *A surface water and sewage management solution is required to accommodate development on the employment site to the satisfaction of the North East Lindsey Water Management Board and the Anglian Water Authority.*
- *A Flood Risk Assessment will be required for individual developments on the majority of the site in compliance with National and Local flood risk guidance and Core Strategy Policy CS19.”*

Other Material Considerations

[Planning for Renewable Energy Development Supplementary Planning Document](#)

6.26 North Lincolnshire Council’ ‘Planning for Renewable Energy Development’ Supplementary Planning Document (‘SPD’) provides more detailed guidance on the existing renewable energy policies in the Local development Framework (‘LDF’). Paragraph 3.10 describes how the South Humber gateway

is ideally located for carbon capture development and the opportunity this presents both environmentally and economically.

6.27 Policy 1 - Biodiversity states:

“Developers should assess the effects of potential renewable energy developments, alone or cumulatively on biodiversity sites, habitats and species and identify measures to avoid or mitigate harm to them and secure their conservation and enhancement.

If a scheme, alone and/or in combination with other plans and projects, could have an impact on an internationally designated site developers must submit all relevant information to the council for them to carry out an assessment of the likely significant effects of the scheme in accordance with the Habitats Regulations.

Developers should also pay attention to assessing the effects of renewable energy developments, alone and in combination with other development on bats, birds and other mobile species within and around the site. Measures should be identified to avoid or mitigate the harm to these species and secure their conservation and enhancement.”

6.28 Policy 5 - soil and hydrology Developers should consider the effects of their proposal for renewable energy development on the soil, hydrology, groundwater and water quality in and around a site. Development should avoid harming soils, hydrology and water quality that would have a negative effect on habitats of principal importance for the conservation of biodiversity.

6.29 Section 6 identifies the different policy considerations drawing on the existing policy approach in the LDF. Policy 6 Flood Risk states:

“Developers must provide a Flood Risk Assessment with any renewable energy development proposal of 1 hectare or more in Flood Zone 1 and any proposal in Flood Zone 2 or 3. If proposals are put forward in areas of high flood risk (zone 3), development will be required to pass an Exception Test. This must demonstrate that the development will be safe during its lifetime, without increasing flood risk elsewhere and where possible will reduce flood risk overall. These requirements also apply to proposals for ancillary development related to renewable energy developments.”

[National planning policy](#)

6.30 The National Planning Policy Framework (‘NPPF’) was adopted in March 2012 and last updated in July 2021. It sets out the Government’s planning policies for England and how these are to be applied. The policies contained within the NPPF are expanded upon and supported by National

Planning Practice Guidance ('NPPG'), which was first published in March 2014 and has been periodically updated since.

6.31 Paragraph 110 states that in assessing applications for development, it should be ensured that

"b) safe and suitable access to the site can be achieved for all users"

6.32 Paragraph 111 states:

"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."

6.33 And Paragraph 112 states that within this context, applications for development should:

"d) allow for the efficient delivery of goods, and access by service and emergency vehicles;"

6.34 Chapter 12 contains the NPPF planning policy in relation to good design. Paragraph 126 explains that the creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development.

6.35 The NPPF sets out its support for renewable energy development in Chapter 14 (Meeting the challenge of climate change, flooding and coastal change). Paragraph 148 states that:

"The planning system should support the transition to a low carbon future. It should help to ... support renewable and low carbon energy and associated infrastructure."

6.36 Paragraph 158 goes on to state:

"When determining planning applications for renewable and low carbon development, local planning authorities should not require applicants to demonstrate the overall need for renewable or low carbon energy and [should] approve the application if its applications are (or can be made acceptable)."

6.37 Paragraph 159 of the NPPF outlines that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future).

6.38 Paragraph 161 notes that all plans should apply a sequential, risk- based approach to the location of development- taking into account the current and future impacts of climate change- so as to avoid, where possible, flood risk to people and property. The paragraph details that the sequential

test should be applied, and if necessary, the exception test. Paragraph 158 explains that the aim of the sequential test is to steer new development to areas with the lowest risk of flooding.

6.39 Chapter 15 contains policies in relation to the conservation and enhancement of the natural environment. Paragraph 174 states: Planning policies and decisions should contribute to and enhance the natural and local environment by:

“a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;...”

6.40 Paragraph 180 states that when determining planning applications local authorities should apply the following principle

“b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;”

6.41 Paragraph 183 states:

“Planning policies and decisions should ensure that: a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals

for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation); (...)

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.”

6.42 Paragraph 185 Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

6.43 “...mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.” NPPGs Considered most relevant to the Proposed Development include;

- Climate Change; <https://www.gov.uk/guidance/climate-change>
- Air Quality; <https://www.gov.uk/guidance/air-quality--3>
- Renewable and low carbon energy; <https://www.gov.uk/guidance/renewable-and-low-carbon-energy>

Emerging policy

[North Lincolnshire Local Plan \(Publication Draft Addendum May 2022\)](#)

6.44 The Council is currently preparing a new Local Plan. Consultation on the Publication draft Local Plan finished on December 2021 and consultation on a subsequent addendum draft local plan ended on 11 July 2022. In accordance with paragraph 48 of the National Planning Policy Framework (NPPF) the policies in this plan may be afforded weight in decision making.

6.45 Policy SS3 sets out the key development principles all new development will be considered against. It states that All proposals for development in North Lincolnshire should reflect the following key principles (unless in practical terms they are not considered relevant by the case officer):

“e. Minimise the impacts arising from climate change and mitigate against its effect, including, reducing flood risk.

l. Take account of existing and/or planned infrastructure, and contribute towards the provision of additional infrastructure to ensure that development is well served by physical, social and environmental infrastructure.”

6.46 The emerging Local Plan also intends to allocate the South Humber Bank as a strategic site allocation. Policy SS10 contains the criteria which the site will be developed in accordance with. The wording replicates the wording of Housing and Employment Land Allocations DPD (2016) Policy SHBE-1.

6.47 Policy EC4: South Humber Bank Landscape Initiative replicates the wording of Local Plan saved policy LC20.

6.48 Policy DQE5: Managing Flood Risk states:

1. *The risk and impact of flooding will be minimised through:*

- a. *directing new development to areas with the lowest probability of flooding;*
- b. *ensuring that all new development addresses the effective management of all sources of flood risk;*
- c. *ensuring that development does not increase the risk of flooding elsewhere; and*
- d. *ensuring wider environmental benefits of development in relation to flood risk.*

A site-specific flood risk assessment (FRA) should be provided for all development in Flood Zone 2 and 3. In Flood Zone 1 a FRA should accompany all proposals for development of sites of 1 hectare or more or land which has been identified by the Local Lead Flood Authority as having critical drainage problems or land that may be subject to other sources of flooding where development would introduce a more vulnerable use.

2. *The Council will support development proposals within areas at risk of flooding (flood zones 2 and 3 or at risk as shown on the flood hazard maps in the Strategic Flood Risk Assessment), where it meets the following prerequisites:*

- a. *it can be demonstrated that there are no other sites available at a lower risk of flooding (i.e. that the sequential test is passed). The sequential test will be based on a districtwide area of alternative sites unless local circumstances relating to the catchment area for the development justify a reduced search area, i.e. there is a specific need for the development in that location. The sequential test is not required for sites allocated in the Local Plan, for minor development (as defined in Planning Practice Guidance, paragraph 046 (Reference ID:7-046-20140306) or for change of use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site);*

- g. there is a management and maintenance plan for drainage and flood risk management infrastructure (where appropriate) for the lifetime of the development, which includes the implementation arrangements for adoption by any public authority, statutory undertaker or management company and any other arrangements to secure the operation and mitigation measures of the scheme throughout its lifetime; the final destination of the discharge complies with the following priority order to: water re-use at point of run-off
 - i. . ground via infiltration;*
 - ii. a water body; surface water sewer.**
- h. where appropriate, SuDS have been included in line with the requirements of Policy DQE6 Sustainable Drainage Systems of this Plan.*

6.49 Policy DQE7 Climate Change and Low Carbon Living states:

- 1. Proposals for development should be designed to mitigate the impacts of climate change and minimise carbon emissions to meet the climate change challenge.*
- 2. All development proposals should be resilient to climate change and decrease the negative impacts of climate change on neighbouring areas by:[...]
 - c. through their location, taking into account the risk of flooding from all sources of flooding;**
- 3. All development proposals should promote low carbon living through the reduction of carbon emissions by:
 - d. maximising the reuse or recycling of materials in new construction and making the best use of existing building and infrastructure;**

6.50 Policy WAS6 Waste Management states:

- 1. Proposals for new development should support the efficient use and recovery of resources throughout its lifetime, including during construction, operation and/or occupation. This should include giving due consideration to sustainable waste management.*
- 2. New developments should include:*

- a. *Design principles and construction methods that minimise the use of primary minerals and encourage the use of building materials made from recycled and alternative materials;*
- b. *Measures that support the implementation of the waste hierarchy, including construction and demolition methods that minimise waste production, maximise the re-use and recovery of materials (as far as practicable) on-site and minimise off-site disposal. In major developments the production of a waste audit and the use of Site Waste Management Plans are encouraged; and,*
- c. *Design and layout that complements sustainable waste management by providing appropriate storage and segregation facilities. Proposals for major development that seek to deliver the housing requirement or employment land will be encouraged to incorporate neighbourhood waste management facilities (where appropriate). Any waste management facilities or bin/waste storage should be well designed and integrated into the development in order to reduce impacts on the community and environment. Provision for waste collection should also be reflected in the design and layout of development.*

6.51 Policy DM2, while concerned with temporary buildings sets out the planning considerations which equally applies to temporary structures.

1. *Planning permission will be granted for temporary buildings provided the following criteria are met:*
 - a. *the building is not highly visible to the general public or detrimental to the amenity of the area/landscape; and,*
 - b. *the development will not prejudice proposals for permanent development on the site.*
2. *In granting planning permission for temporary buildings, conditions may be imposed requiring the landscaping of the development or other measures to help mitigate its impact on the visual amenity of the area.*
3. *A time limited (temporary) planning permission will be granted for non-permanent structures in cases where a permanent permission would prejudice future development of the site.*

6.52 Policy DM3 sets out the emerging policy in relation to environmental protection.

1. *Development proposals as appropriate to their nature and scale, should demonstrate that environmental impacts on receptors have been evaluated and appropriate measures have been taken to minimise the risks of adverse impacts to air, land and water quality, whilst assessing vibration, heat, energy, light and noise pollution.*

6.53 With regards to Air Quality the policy states:

2. *The Council will seek to ensure that proposals for new development will not have an unacceptable negative impact on air quality and will not further exacerbate air quality in the Scunthorpe Town AQMA or contribute to air pollution in areas which may result in a new AQMA. Applicants will be required to provide an air quality impact assessment to demonstrate this.*
3. *The Council will seek to ensure that where a sensitive use is being proposed in an area of known poor air quality, the applicant will be required to provide an air quality impact assessment to demonstrate the development will not result in adverse effects on human health and local amenity. Residential development within the Scunthorpe AQMA will not be permitted where there is evidence of adverse effects on human health and local amenity.*

6.54 In relation to Noise pollution the policy states:

6. *Development generating noise which is likely to create significant adverse impacts on health and quality of life and cannot be mitigated and controlled through the use of conditions will not be permitted.*

6.55 In relation to Contaminated land:

7. *. In the case of proposals for development on land known or strongly suspected as being impacted by contamination, hazardous gases, land instability, of a sensitive end use, the applicant will be required to provide sufficient information that demonstrates that the level of contamination can be overcome by remedial measures or improvements. In these cases permission will only be granted where a phase 1 desk based assessment and detailed site survey has been submitted. Where significant risks to human health and/or the environment are present; planning permission will only be granted in circumstances where a suitable scheme of remedial measures has been agreed that will be obtained via a planning condition and/or legal agreement to overcome any existing contamination.*

6.56 In relation to the Water Environment

10. *Development will not be permitted where it would have an adverse effect on the quality or quantity of groundwater resources or watercourses and water bodies. Opportunities for environmental improvement are encouraged, particularly:*

- a. the availability of water to support the development;*
- b. the capacity to effectively and sustainably manage foul and surface water;*
- c. sustainable drainage systems;*
- d. water efficiency*;*
- e. access to infrastructure and water environments for the purpose of maintenance and monitoring;*
- g. acknowledging the requirements of the Water Framework Directive. (*The requirement for higher water efficiency standard of 110 l/person/day).*

6.57 In relation to Hazardous Installations it states:

12. Proposals for the development of hazardous installations/pipelines, modifications to existing sites, or development in the vicinity of hazardous installations or pipelines, will be permitted where it has been demonstrated that the amount, type and location of hazardous substances would not pose unacceptable health and/or safety risks.

6.58 Policy ID1 Delivering Infrastructure states:

- 1. The Council will require all developments to meet the on and off-site infrastructure requirements needed to support the development and mitigate the impact of the development on the existing community and environment to make it acceptable in planning terms.*

7.0 ASSESSMENT OF THE PROPOSED DEVELOPMENT

7.1 This section of the PDAS provides an assessment of the application proposals, in order to demonstrate how the Proposed Development has been influenced by and is compliant with relevant planning policy. The key topics are considered to be as follows:

- The Principle of Development.
- Flood Risk.;
- Air Quality.
- Noise.
- Biodiversity.
- Ground Conditions.
- Scale, Appearance and Design.
- Traffic and Transport.

Principle of Development

Carbon Capture technology

7.2 The principle of the Carbon Capture pilot plant has planning policy support at all levels. Although not explicitly referenced in NPPF policy, paragraph 152 establishes the planning system's overarching objective to support the transition to a low carbon future and support for low carbon energy, associated infrastructure. Paragraph 158 recognises that small scale low carbon developments such as the Pilot Plant, would play a valuable role in reducing emissions.

7.3 Local Planning policy explicitly expresses support for carbon capture technology. NLC Core Strategy Policy CS 18 supports new technology and development for carbon capture, particularly in relation to the heavy industrial users in North Lincolnshire, to help reduce CO₂ emissions. Building on this, the Planning for Renewable Energy Development SPD supplements Policy CS18 identifying the South Humber gateway, where the Proposed Development is located, as being ideally located for carbon capture development.

7.4 Achieving sustainable development is the core purpose of the NPPF, this has both an economic and environmental objective. This purpose is reflected in NLC Policy CS2 where the achievement of sustainable development requires proposals to contribute to support a competitive business and

industrial sector and also account for local environmental capacity and to improve air, water and soil quality and minimise the risk and hazards associated with flooding.

- 7.5 The SHBSES is a regionally important economic area characterised by energy intensive industry with VPI Immingham being an important supplier of the energy. Local Plan Policy CS12 recognises the need to harmonise future employment related development in the SHBSES with environmental protection and improvement. Policy SHBE-1 in the HELA sets out a requirement for pollution control measure to be implemented wherever possible. The purpose of the Pilot Plant is to better understand the design parameters for a full-scale commercial carbon capture development at the CHP Plant as part of the Humber Zero Project. Carbon capture technology will prevent carbon dioxide emissions being released into the atmosphere and mean that industry can grow whilst meeting emissions reduction targets. The Proposed Development is key to being able to reduce carbon emissions and supporting economic growth.

Temporary development

- 7.6 As set out in Section 3, the Proposed Development is required to be operational for a period of six to 12 months. NLC Local Plan Policy DS6 and emerging Local Plan policy DM2 set out the considerations for the approval of temporary building/ structures requiring the building/ structures to not be highly visible to the general public or detrimental to the amenity of the area/ landscape; the development to not prejudice proposals for permanent development on the site and conditions may be imposed requiring the landscaping of the development or other measures to help mitigate its impact on the visual amenity of the area.
- 7.7 The design components of the Proposed Development are discussed in Section 5 of this document. The Pilot Plant is located well within the existing CHP Plant site and screened by much larger and prominent existing structures. Only the absorber and stripper column will be visible but will be viewed in the context of the existing immediate and wider surrounding industrial context (and will appear analogous with the existing CHP plant). As such there will be no detrimental impacts on the landscape or the amenity value of the area and there should be no need for any conditions for a landscaping scheme.
- 7.8 The Site is located within the existing operational boundary of the CHP Plant on an area of unused hardstanding. The Proposed Development will not result in any permanent lasting effects on the Site which will inhibit its future use. The full-scale carbon capture facility for the CHP Plant will be constructed elsewhere because it will require a larger site. On the basis that the Proposed Development will not prejudice future redevelopment of the Site, the Applicant does not consider

a time limited permission necessary, but if the Council does not agree, any permission would need to be for 18 months to allow for construction, operation, decommissioning and removal of the Pilot Plant.

Flood Risk

- 7.9 The Site is located in Flood Risk 3, and within the Employment Land Allocation SHBE-1 ‘South Humber Bank’. The sequential test is passed by virtue of conformity with the site allocation and the need for this temporary development to be located in close proximity to the carbon dioxide emitter that it is intended to connect to.
- 7.10 In accordance with the NPPF, Core Strategy Policy CS 19 and the Renewable Energy Development SPD the exception test has been completed and is contained in the Flood Risk and Drainage Statement prepared by AECOM and submitted as part of the planning application.
- 7.11 With regard to criterion a) of the exception test, the Proposed Development will help to de-risk a full-scale post combustion carbon capture plant and provide far reaching environmental and economic sustainability benefits to North Lincolnshire by decarbonising a historically emission intensive sector of its economy and supporting future economic growth in the South Humber Bank. The Flood Risk and Drainage Statement has assessed all potential sources of flooding to the Proposed Development, including tidal, fluvial, groundwater, land drainage, overland flow, artificial sources, and sewer drainage arrangements. It concludes that the risk of flooding from each of these sources is considered to be low. On this basis, the sustainability benefits of the Proposed Development are considered to outweigh the flood risk.
- 7.12 With regards to criterion b) of the exception test, the Proposed Development will be integrated into the CHP Plant’s existing set of flood control plans and procedures, namely:
- A site drainage plan to control surface water runoff and contaminated water collection and treatment.
 - Regular maintenance of the drainage infrastructure to prevent blockages.
 - Registration to the Environment Agency’s Flood Warning Service as well as a site emergency plan to protect users on site.
- 7.13 Furthermore, the Proposed Development will be located on an area of existing hardstanding area and is unlikely to change the area of impermeable surface. As a result of all these measures, the Proposed Development is considered to satisfy criteria b) of the exception test and considered

acceptable development in this location in accordance with the NPPF and Core Strategy Policy CS 19.

Air Quality

- 7.14 Protection of the natural environment is an important part of the NPPF's environmental objective. Paragraph 174 introduces the planning policies for the protection and conservation of the natural and local environment including preventing new development from contributing to unacceptable levels of air pollution. Within Core Strategy Policy CS2 the achievement of sustainable development includes taking account of local environmental capacity to improve air quality. Saved Policy DS11 will only permit development where it can be demonstrated that the levels of potentially polluting emissions do not pose a danger.
- 7.15 The Pilot Plant will receive approximately 0.1% of the exhaust gases from either of the gas turbines (GT1 or GT2) currently operating onsite and potentially also one auxiliary boiler, and therefore represents a very small operation in terms of the main activities carried out at the CHP Plant. The Pilot Plant does not include carbon sequestration, instead the stripped CO₂ will be fed back into the GT1 or GT2 ducting for release via existing 90m stack. The Proposed Development will therefore not reduce airborne concentrations of CO₂ emitted from the CHP Plant. However, there will be a trace amount of residual solvent, and potentially solvent degradation products within the returned flue gas.
- 7.16 The Air Quality Statement prepared by AECOM and submitted as part of this application has considered the findings of Pilot Plant operations elsewhere and assessed the anticipated residual solvent concentrations as being insignificant. The Applicant has engaged with the Environment Agency to agree the approach to the environmental permitting of the pilot plant. The EA have agreed that the activity can be permitted under Permit Condition 2.3 of the existing CHP Plant Permit and that a Permit Variation is not required.
- 7.17 Due to the small scale of the Pilot Plant and short, duration of proposed operations, it is considered that the air quality impacts associated with the Proposed Development will be negligible and there will be no adverse effects on any receptors. Accordingly the Proposed Development is considered to be acceptable with regards to air quality policy.

Noise

- 7.18 NPPF Paragraphs 174 and 185, Core Strategy Policy CS2 and Saved Policy DS11 equally apply to noise pollution and similarly seeks to prevent development from being exposed to, or contributing

to, unacceptable noise levels. The Pilot Plant is not inherently noisy plant and therefore it will not be noticeable from the CHP Plant's existing operation noise levels.

7.19 Construction noise from plant installation and vehicle movements will be limited. The contractor will adhere to best practice environmental management methods/ procedures, which will include consideration of working hours and noise management. Weekend working may be required, on occasion, to limit impacts on CHP Plant operation. This will be infrequent and of a nature such that no significant noise effects are expected. When considered against national and local planning policies, the noise impacts of the Proposed Development will not have an adverse effect on the environment.

Biodiversity

7.20 An Ecological Statement has been prepared and submitted alongside this application. In accordance with NPPF and Local policy guidance, consideration has been given to the Proposed Development's potential impact on ecological receptors and international, national and local protected sites for nature conservation. .

7.21 The Application Site is not subject to a protected ecological classification/ designation nor is it located within an SAC, SPA, Ramsar site or SSSI, the nearest being the Humber Estuary SAC, SPA, Ramsar site and SSSI, approximately 1.6 km to the north-east. The site itself is comprised of existing hardstanding. Detailed ecological investigations have been undertaken within the application area over 2021 and 2022, including, habitat assessments and comprehensive surveys for invertebrates, great crested newts, reptiles, birds, bats, badgers and water voles

7.22 The Proposed Development will have very limited and localised effects on the environment. The potential for release of pollutants to air and water during construction and operation will be low and controlled by well-established site control practices. Given the scale of the Proposed Development, absence of protected species and relative distance from any designated sites, the Proposed Development is not considered to adversely affect any ecological receptors.

Ground Conditions

7.23 NPPF Paragraph 183 and Saved Policy DS7 seeks to ensure that the applicant has properly accounted for ground stability and contamination and this is properly informed by adequate investigation.

7.24 The Site is comprises hardstanding and requires limited preparation. The Site has been subject to ground investigations/ monitoring as part of the CHP Plant site's development and is not

contaminated. The overall risk of ground contamination is assessed as being low. The amount of hazardous substances required to be stored on site will be low but nevertheless the risk of pollutant laden run-off and accidental/ unplanned emissions/ releases/ spills will be mitigated by the bunding of storage tanks and established site wide management practices at the CHP Plant.

Scale, Appearance and Design

- 7.25 NPPF Chapter 12 contains national planning policies to achieve well designed places. Within Local Policy Saved policy DS1 a high standard of design is expected in all developments and proposals for poorly designed development will be refused. Cores Strategy Policy CS5 also requires new development to incorporate the principles of sustainable development within its design.
- 7.26 The design principles of the Proposed Development are described in Section 5 of this document. The surrounding context is dominated by the large and bulky structures at the CHP Plant as well as the adjacent Phillips 66 Humber Refinery. The immediate context within which the Site sits is already industrialised in terms of its character and appearance. The design and visual appearance of the Proposed Development is similarly industrial and functional, motivated by the need to maximise the performance of the Pilot Plant thus it inherently incorporates the principles of sustainable development.
- 7.27 Notwithstanding that the Proposed Development is temporary, the Site benefits from being surrounded by the much larger and more prominent gas turbine building and network of pipelines, which will effectively screen the Pilot Plant and reduce visibility outside the Site. On this basis the proposed design approach is considered appropriate to its surroundings and compliant with national and local planning policy.

Traffic and Transport

- 7.28 The NPPF and Core Strategy Policy CS 25 have an overarching presumption in favour of promoting sustainable transport requiring a development to manage its impact on the transport network. Saved Policy T2 requires a development to ensure that satisfactory access can be provided to the site.
- 7.29 The number of vehicle trips during the construction phase is expected to be relatively limited with 5 HGV movements over the 13 week construction period. The Applicant will liaise with the construction crew to ensure that these trips will be conducted outside of peak traffic times (between 08:00-09:00 and 17:00-18:00). Up to 14 construction staff will be expected on site. The CHP Plant benefits from an existing controlled car park which will be utilised.

- 7.30 During the operational phase, traffic movements are expected to amount to two HGV movements, one for the delivery and one for the removal of amine solvent. Up to two staff will be present on site during operation. Decommissioning of the Pilot Plant will mirror installation and involve 5 HGV movements. It is therefore considered the increase of vehicle trips is small, and will not have a material impact on highway capacity for the duration of the Proposed Development.
- 7.31 Following consideration of highway access it has been concluded that the proposed access via Rosper Road is fit for purpose for both construction and operation. This has been demonstrated through previous construction at the CHP Plant. It is therefore considered the Proposed Development will not have an adverse impact on the local highway network and would provide safe access/egress in line with local and national planning policy.

8.0 SUMMARY AND CONCLUSIONS

- 8.1 By 2050, the UK has committed to reducing carbon emissions to net zero. This can only be achieved by decarbonising existing power and industry effectively. Energy intensive industries account for more than 20% of the economy and 1 in 10 jobs in the Humber. Carbon capture is consequently supported at national and local levels as an important means of reaching Net Zero.
- 8.2 Humber Zero is a project to reduce carbon dioxide (CO₂) emissions and create a low carbon future for the Humber's industry. Humber Zero aims to remove up to 8 million tonnes (Mt) of CO₂ annually. Humber Zero is within close proximity to two proposed CO₂ transport and storage networks (the Humber Low Carbon Pipelines Project and the V Net Zero Project).
- 8.3 The Proposed Development comprises a pilot post-combustion carbon capture plant to inform the first phase of the Humber Zero Project. It is in-effect a smaller test facility intended for the purpose of learning about carbon capture technology and its application in this site context. The knowledge obtained would be used to establish the key design and operating parameters to inform and de-risk a full-scale post-combustion carbon capture plant.
- 8.4 The principle of development at this Site is established by virtue of the above national policy, the allocation in the Local Plan, the existing CHP Plant use, and the availability of suitable land and connections.
- 8.5 Potential effects on the environment have been considered. The Council issued a Screening Opinion on 6 July 2022, which confirmed that EIA is not required. By using existing hard standing and containerised equipment, impacts on ground conditions are avoided. No new air quality emissions points are created and the Site is suitably located and designed with respect to noise and flood risk/drainage considerations.
- 8.6 The Applicant has engaged with the Council prior to the submission of the planning application to assemble a comprehensive application that is proportionate to the scale and limited duration of the Proposed Development, and does not consider there is a need or justification for pre commencement conditions or obligations to be imposed. Nevertheless and for the avoidance of doubt, in accordance with the relevant regulations the Applicant asks to be consulted on any pre commencement condition wording so that they may seek to minimise the inevitable impact on the deployment of the Proposed Development.
- 8.7 The Proposed Development accords with the Statutory Development Plan and in the absence of material considerations to the contrary should, we consider, be granted planning permission.

