

KEADBY 3 CARBON CAPTURE POWER STATION

A collaboration between **SSE Thermal** and **Equinor**

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The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

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

Landscaping and Biodiversity Management and Enhancement Plan

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(q)

Applicant: Keadby Generation Limited

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GLOSSARY

Abbreviation	Description
AGI	Above Ground Installation - installations used to support the safe and efficient operation of a pipeline; above ground installations are needed at the start and end of a cross-country pipeline and at intervals along the route.
AIL	Abnormal Indivisible Load - a load that cannot be broken down into smaller loads for transport without undue expense or risk of damage. It may also be a load that exceeds certain parameters for weight, length and width.
CCGT	Combined Cycle Gas Turbine - a highly efficient form of energy generation technology. An assembly of heat engines work in tandem using the same source of heat to convert it into mechanical energy which drives electrical generators and consequently generates electricity.
CCUS	Carbon Capture, Usage and Storage - group of technologies designed to reduce the amount of carbon dioxide (CO ₂) released into the atmosphere from coal and gas power stations as well as heavy industry including cement and steel production. Once captured, the CO ₂ can be either re-used in various products, such as cement or plastics (utilisation), or stored in geological formations deep underground (storage).
CEMP	Construction Environmental Management Plan - a plan to outline how a construction project will avoid, minimise or mitigate effects on the environment and surrounding area.
CoW	Clerk of Works - a person who oversees building work in progress.
DCO	Development Consent Order - made by the relevant Secretary of State pursuant to The Planning Act 2008 to authorise a Nationally Significant Infrastructure Project. A DCO can incorporate or remove the need for a range of consents which would otherwise be required for a development. A DCO can also include rights of compulsory acquisition.
Defra	Department for Environment, Food and Rural Affairs

Abbreviation	Description
EIA Regulations	Environmental Impact Assessment Regulations 2017
ES	Environmental Statement - a report in which the process and results of an Environment Impact Assessment are documented.
HP	High Pressure
INNS	Invasive Non-native Species - species that have occurred outside of their natural range. Invasive species have the potential to hinder or prevent survival of others within the ecosystem.
ISMP	Invasive Species Management Plan - preventing and managing the spread of invasive species and their potential impacts.
LBAP	Local Biodiversity Action Plan – a strategy to guide biodiversity conservation, communication and education work at a local (usually county) level.
LBMEP	Landscape and Biodiversity Management and Enhancement Plan
MW	Megawatt – unit of power.
NEP	The Northern Endurance Partnership - a partnership between bp, Eni, Equinor, National Grid, Shell and Total to develop infrastructure to transport and store CO2 emissions.
NLC	North Lincolnshire Council
NPPF	<p>The National Planning Policy Framework – Policy Framework which first came into effect in March 2012 (with some transitional arrangements) replacing the majority of national planning policy other than NPSs. A revision of the NPPF was published in July 2018 by the Ministry of Housing, Communities and Local Government and updated again in July 2021.</p> <p>The NPPF is part of the Government's reform of the planning system intended to make it less complex, to protect the environment and to promote sustainable growth. It does not contain any specific policies on Nationally Significant Infrastructure Projects, but its policies may be considered in decisions on DCOs if the Secretary of State considers them to be 'relevant'.</p>
NPS	National Policy Statements – statements produced by Government under the Planning Act 2008 providing the policy framework for Nationally Significant Infrastructure Projects. They include the Government's view of the need for and objectives for the development of Nationally Significant Infrastructure Projects in a particular sector such as energy and are used to determine applications for such development.
NSIP	Nationally Significant Infrastructure Projects – defined by the Planning Act 2008 and covers projects relating to energy (including generating stations, electric lines and pipelines);

Abbreviation	Description
	<p>transport (including trunk roads and motorways, airports, harbour facilities, railways and rail freight interchanges); water (dams and reservoirs, and the transfer of water resources); waste water treatment plants and hazardous waste facilities.</p> <p>These projects are only defined as nationally significant if they satisfy a statutory threshold in terms of their scale or effect.</p>
OMH	Open Mosaic Habitats - found mainly in urban and formerly industrial areas and have high biodiversity value.
The Order	The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order
PCC	Power and Carbon Capture
PINS	Planning Inspectorate - executive agency of the Department for Communities and Local Government of the United Kingdom Government. It is responsible for determining final outcomes of town planning.
SoS	Secretary of State - title typically held by Cabinet Ministers in charge of Government Departments.
WCA	Wildlife Countryside Act 1981 (as amended) – legislation for the protection of animals, plants and certain habitats in the UK.
ZCH	Zero Carbon Humber - a consortium of energy and industrial companies and academic institutions with a shared vision to transform the Humber region into the UK's first net-zero carbon cluster by 2040.

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Revision History for Version VP3.0

Item	Nature of Revision
1	<p>Updates made to the LBMEP considering:</p> <p>a) The notification to the ExA that the Applicant intends to withdraw Change 2 (extension to Additional AIL Route) from the Change Request. Change No. 2 formed part of the updated LBMEP VP2.0 submitted at Deadline 5 (REP5-034) and as this has now been withdrawn by the Applicant, the LBMEP has been updated on this basis, including Figure 4.15 – Rev 03.</p> <p>Tracked changes version shows VP2.0 revisions, given that Version 2.0 is being withdrawn from Examination and re-submitted at Deadline 6a, minus Change 2.</p>
2	New Section 1.5 added to clarify the status of the Change Request

Revision History for Version VP2.0

Item	Nature of Revision
1	<p>Updates made to the LBMEP considering:</p> <p>a) use of Biodiversity Metric Version 3.0 released in July 2021, following acceptance of the DCO Application, to re-evaluate overall biodiversity net gain (including the Proposed Development Changes) and to form the basis for updated biodiversity management and enhancement plans (Figure 4.15 – Rev 03). Please refer to Appendix D.</p>

EXECUTIVE SUMMARY

- 1 This Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) has been prepared on behalf of Keadby Generation Limited (the Applicant) and forms part of the application for development consent for the construction, operation (including maintenance) and decommissioning of a new low carbon gas fired electricity generating station (the Proposed Development). The Proposed Development is predominantly located within the wider Keadby Power Station site, to the west of Keadby 2 Power Station, in North Lincolnshire.
- 2 The purpose of this document is to set out the measures proposed to mitigate the potential impacts and effects of the Proposed Development on landscape and biodiversity features, and to enhance the biodiversity, landscape and green infrastructure value of the Proposed Development Site. The final LBMEP will be agreed as a Requirement of the draft DCO (**Application Document Ref. 2.1**) [APP-005].
- 3 The Proposed Development has been designed, as far as is practicable, to avoid or reduce effects on landscape and biodiversity features through careful siting, development design and impact avoidance. These include measures to avoid impacts on protected species to comply with legislation (see **Chapter 11: Biodiversity and Nature Conservation** (ES Volume I - **Application Document Ref. 6.2**)).
- 4 The ecological impact assessment (**Chapter 11: Biodiversity and Nature Conservation** (ES Volume I - **Application Document Ref. 6.2**) [APP-054] including **Chapter 11: Biodiversity and Nature Conservation** of the ES Addendum (**Document Ref. 6.2.11 Rev 03**) identifies that the careful siting of the Proposed Development to avoid sensitive habitats has minimised potential for sensitive habitats and species to be adversely affected. Consequently, no likely significant ecological effects are predicted. However, the assessment still identifies a need for proportionate embedded ecological mitigation for purposes of good practice and legislative compliance. Habitat re-instatement and enhancement is also required in order to demonstrate no net loss and a net gain of biodiversity in accordance with the requirements of national and local planning policy (currently there is no legal requirement to deliver biodiversity net gain, and currently this is not anticipated for NSIP before 2025).
- 5 The landscape and visual impact assessment (**Chapter 14: Landscape and Visual Amenity** (ES Volume I - **Application Document Ref. 6.2**) [APP-057] including **Chapter 14: Landscape and Visual Amenity** of the ES Addendum (**Document Ref. 6.2.14 - Rev 03**) concludes that the Proposed Development will result in significant adverse effects on visual amenity during construction and operation from three of the assessed viewpoints as a result of the close distance to the Proposed Development Site and lack of intervening vegetation:
 - Viewpoint 1 (Chapel Lane West, Keadby);

- Viewpoint 2 (Gate Keepers Residence (Vazon Bridge), Keadby); and
 - Viewpoint 4 (PRoW (KEAD9, KEAD10) north of Keadby).
- 6 However, the opportunity for mitigation of the visual effects of the Proposed Development is limited due to the size and scale of the Proposed Development. As shown in the assessment, the effects on visual amenity largely relate to the height of the tallest structures and as such it is considered that the addition of landscape features such as trees and woodland would not be effective in reducing the effects on visual amenity. However, there remains a need for enhancements to the landscape character and improvements to the green infrastructure network, to meet requirements of local and national planning policy.
- 7 This document outlines the landscape and biodiversity impact avoidance measures that will be implemented prior to, and during, construction of the Proposed Development, as well as the habitat reinstatement, enhancement, management and monitoring measures to be implemented at the end of construction and continuing once the Proposed Development is operational. This would be controlled and implemented through the final Construction Environmental Management Plan (CEMP) that will be developed by the contractor. A Framework CEMP is provided as **Application Doc Ref. 7.1 [APP-160]**.
- 8 The proposed landscape and biodiversity enhancement measures are summarised below. The proposals have been designed to be delivered within the existing land ownership of the Applicant and focus on enhancing the value of existing habitats within the vicinity of the Proposed Development to include:
- enhancement and creation of flower-rich native grassland;
 - new species-rich native hedgerow plantings;
 - enhancement of field drains for water voles and other aquatic biodiversity;
 - enhancement of the Hatfield Waste Drain and the Stainforth and Keadby Canal for aquatic biodiversity; and
 - installation of nest boxes for barn owl and other birds, habitat creation for willow tit, and installation of roosting boxes for bats.
- 9 The proposed locations for flower-rich native grassland includes areas directly connected to, and therefore enhancing, two habitat corridors associated with Local Wildlife Sites (LWS), namely Stainforth and Keadby Canal Corridor LWS and Hatfield Waste Drain LWS. They also complement the undesignated former Keadby Ash Tip, another site of biodiversity importance.

1.0 INTRODUCTION

1.1 Overview

- 1.1.1 This Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) (**Application Document Ref. 5.10**) has been prepared by AECOM on behalf of Keadby Generation Limited ('the Applicant') which is a wholly owned subsidiary of SSE plc. It forms part of the application (the 'Application') for a Development Consent Order (a 'DCO'), that has been submitted to the Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy (BEIS), under Section 37 of 'The Planning Act 2008' (the '2008 Act').
- 1.1.2 The Applicant is seeking development consent for the construction, operation and maintenance of a new low carbon Combined Cycle Gas Turbine (CCGT) Generating Station ('the Proposed Development') on land at, and in the vicinity of, the existing Keadby Power Station, Trentside, Keadby, Scunthorpe DN17 3EF (the 'Proposed Development Site').
- 1.1.3 The Proposed Development is a new electricity generating station of up to 910 megawatts (MW) gross electrical output, equipped with carbon capture and compression plant and fuelled by natural gas, on land to the west of Keadby 1 Power Station and the (under commissioning) Keadby 2 Power Station, including connections for cooling water, electrical, gas and utilities, construction laydown areas and other associated development. It is described in **Chapter 4: The Proposed Development of the Environmental Statement (ES) (ES Volume I - Application Document Ref. No. 6.2)** and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 - Rev 03**).
- 1.1.4 The Proposed Development falls within the definition of a 'Nationally Significant Infrastructure Project' (NSIP) under Section 14(1)(a) and Sections 15(1) and (2) of the 2008 Act, as it is an onshore generating station in England that would have a generating capacity greater than 50MW electrical output (50MWe). As such, a DCO application is required to authorise the Proposed Development in accordance with Section 31 of the 2008 Act.
- 1.1.5 The DCO, if made by the SoS, would be known as 'The Keadby 3 Carbon Capture Equipped Gas Fired Generating Station Order' (the Order).

1.2 The Applicant

- 1.2.1 The Applicant, Keadby Generation Limited, is the freehold owner of a large part of the Proposed Development Site and is a wholly owned subsidiary of the FTSE 100-listed SSE plc, one of the UK's largest and broadest-based energy companies, and the country's leading developer of renewable energy generation. Over the last 20 years, SSE plc 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 operates the Keadby Windfarm

which lies to the north and south of the Proposed Development Site and generates renewable energy from 34 turbines, with a total installed generation capacity of 68MW.

- 1.2.2 SSE has produced a 'Greenprint' document (SSE plc, 2020a) that sets out a clear commitment to investment in low carbon power infrastructure, working with government and other stakeholders to create a net zero power system by 2040. This includes investment in flexible sources of electricity generation and storage for times of low renewable output which will complement other renewable generating sources, using low carbon fuels and/ or capturing and storing carbon emissions. SSE is working with leading organisations across the UK to accelerate the development of carbon capture, usage and storage ('CCUS') clusters, including Equinor and National Grid Carbon.
- 1.2.3 The design of the Proposed Development demonstrates this commitment. The Proposed Development will be built with a clear route to decarbonisation, being equipped with post-combustion carbon capture technology, consistent with SSE's commitment to reduce the carbon intensity of electricity generated by 60% by 2030, compared to 2018 levels (SSE plc, 2020b). It is intended that the Proposed Development will connect to infrastructure that will be delivered by the Zero Carbon Humber (ZCH) Partnership and Northern Endurance Partnership (NEP) for the transport and offshore geological storage of carbon dioxide.

1.3 What is Carbon Capture, Usage and Storage?

- 1.3.1 CCUS is a process that removes carbon dioxide emissions at source, for example emissions from a power station or industrial installation, and then compresses the carbon dioxide so that it can be safely transported to secure underground geological storage sites. It is then injected into layers of solid rock filled with interconnected pores where the carbon dioxide becomes trapped and locked in place, preventing it from being released into the atmosphere. Plate 1 shows what is involved in the process.

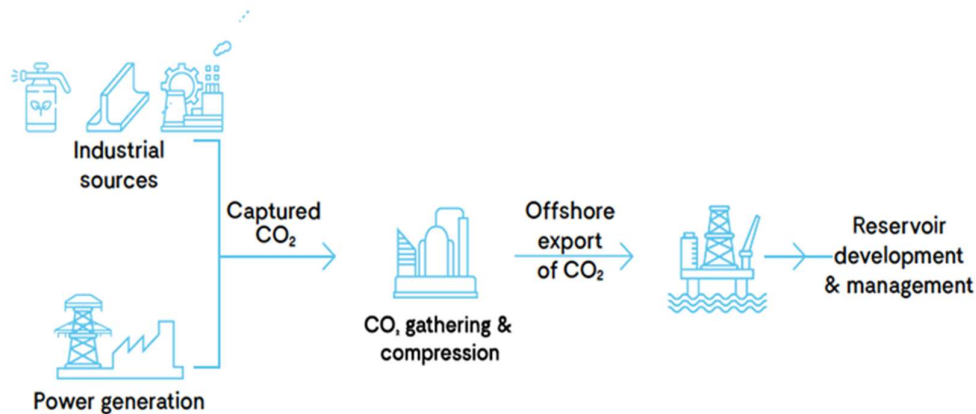


Plate 1: Illustration of the Carbon Capture, Usage and Storage

- 1.3.2 The technologies used in CCUS are proven and have been used safely across the world for many years. Geological storage sites are located far underground and are subject to stringent tests to ensure that they are geologically suitable. It is expected that the storage sites will be located offshore, in areas such as the North Sea. The NEP has been formed to develop the offshore infrastructure to transport and store carbon dioxide emissions in the North Sea.
- 1.3.3 CCUS is crucial to reducing carbon dioxide emissions and combatting global warming. The UK Government has committed to achieving Net Zero in terms of greenhouse gas emissions by 2050. This is a legally binding target. UK Government policy further states that the *'deployment of power CCUS projects will play a key role in the decarbonisation of the electricity system at low cost'* (HM Government, 2020a, page 47).
- 1.3.4 The Proposed Development will provide up to 910MWe (gross) of dispatchable capacity and capture some 2 million tonnes of carbon dioxide per annum, dependent upon the turbine equipment chosen and the running hours of the plant. The Proposed Development could be up and running by the mid-2020s and will facilitate the timely development of a major CCUS cluster in the Humber region, making an important contribution towards the achievement of Net Zero by 2050.

1.4 The Proposed Development

- 1.4.1 The Proposed Development will work by capturing carbon dioxide emissions from the gas-fired power station and connecting into the Humber Low Carbon Pipelines project pipeline network, being promoted by NGCL, for onward transportation to the Endurance storage site under the North Sea.
- 1.4.2 The Proposed Development would comprise a low carbon gas fired power station with a gross electrical output capacity of up to 910MWe and associated

buildings, structures and plant and other associated development defined in Schedule 1 of the draft DCO (**Application Document Ref. No. 2.1**) [**APP-005**] as Work No. 1 – 11 and shown on the Works Plans (**Application Document Ref. No. 4.3**) [**APP-012**].

1.4.3 At this stage, 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 and regulation. The design of the Proposed Development therefore incorporates a necessary degree of flexibility to allow for the future selection of the preferred technology in light of prevailing policy, regulatory and market conditions once a DCO is made.

1.4.4 The Proposed Development will include:

- a carbon capture equipped electricity generating station including a CCGT plant (**Work No. 1A**) with integrated cooling infrastructure (**Work No. 1B**), and carbon dioxide capture plant (CCP) including conditioning and compression equipment, carbon dioxide absorption unit(s) and stack(s) (**Work No. 1C**), natural gas receiving facility (**Work No. 1D**), supporting uses including control room, workshops, stores, raw and demineralised water tanks and permanent laydown area (**Work No. 1E**), and associated utilities, various pipework, water treatment plant, wastewater treatment, firefighting equipment, emergency diesel generator, gatehouse, chemical storage facilities, other minor infrastructure and auxiliaries/ services (all located in the area referred to as the 'Proposed Power and Carbon Capture (PCC) Site' and which together form **Work No. 1**);
- natural gas pipeline from the existing National Grid Gas high pressure (HP) gas pipeline within the Proposed Development Site to supply the Proposed Power and Carbon Capture (PCC) Site including an above ground installation (AGI) for National Grid Gas's apparatus (**Work No. 2A**) and the Applicant's apparatus (**Work No. 2B**) (the 'Gas Connection Corridor');
- electrical connection works to and from the existing National Grid (National Grid Electricity Transmission) 400kV Substation for the export of electricity (**Work No. 3A**) (the 'Electrical Connection Area to National Grid 400kV Substation');
- electrical connection works to and from the existing Northern Powergrid 132kV Substation for the supply of electricity at up to 132kV to the Proposed PCC Site, and associated plant and equipment (**Work No. 3B**) (the 'Potential Electrical Connection to Northern Powergrid 132kV Substation');
- Water Connection Corridors to provide cooling and make-up water including:
 - underground and/ or overground water supply pipeline(s) and intake structures within the Stainforth and Keadby Canal, including temporary cofferdam (**Work No. 4A**) (the 'Canal Water Abstraction Option');

- in the event that the Canal Water Abstraction Option is not available, works to the existing Keadby 1 power station cooling water supply pipelines and intake structures within the River Trent, including temporary cofferdam (**Work No. 4B**) (the ‘River Water Abstraction Option’); and
- works to and use of an existing outfall and associated pipework for the discharge of return cooling water and treated wastewater to the River Trent (**Work No. 5**) (the ‘Water Discharge Corridor’);
- towns water connection pipeline from existing water supply within the Keadby Power Station to provide potable water (**Work No. 6**);
- above ground carbon dioxide compression and export infrastructure comprising an above ground installation (AGI) for the undertaker’s apparatus including deoxygenation, dehydration, staged compression facilities, outlet metering, and electrical connection (**Work No. 7A**) and an above ground installation (AGI) for National Grid Carbon’s apparatus (**Work No. 7B**);
- new permanent access from the A18, comprising the maintenance and improvement of an existing private access road from the junction with the A18 including the western private bridge crossing of the Hatfield Waste Drain (**Work No. 8A**) and installation of a layby and gatehouse (**Work No. 8B**), and an emergency vehicle and pedestrian access road comprising the maintenance and improvement of an existing private track running between the Proposed PCC Site and Chapel Lane, Keadby and including new private bridge (**Work No. 8C**);
- temporary construction and laydown areas including contractor facilities and parking (**Work No. 9A**), and access to these using the existing private roads from the A18 and the existing private bridge crossings, including the replacement of the western existing private bridge crossing known as ‘Mabey Bridge’ over Hatfield Waste Drain (**Work No. 9B**) and a temporary construction laydown area associated with that bridge replacement (**Work No. 9C**);
- temporary retention, improvement and subsequent removal of an existing Additional Abnormal Indivisible Load Haulage Route (**Work No. 10A**) and temporary use, maintenance, and placement of mobile crane(s) at the existing Railway Wharf jetty for a Waterborne Transport Offloading Area (**Work No. 10B**) and inclusion of land within the River Trent (**Work No. 10C**) which will be required for the mooring of vessels at the Waterborne Transport Offloading Area;
- landscaping and biodiversity enhancement measures (**Work No. 11A**) and security fencing and boundary treatments (**Work No. 11B**); and
- minor associated development including: surface water drainage systems; pipeline and cable connections between parts of the Proposed Development Site; hard standings and hard landscaping; soft landscaping, including bunds and embankments; external lighting, including lighting

columns; gatehouses and weighbridges; closed circuit television cameras and columns and other security measures; site preparation works including clearance, demolition, earthworks, works to protect buildings and land, and utility connections; accesses, roads, roadways and vehicle and cycle parking; pedestrian and cycle routes; and temporary works associated with the maintenance of the authorised development.

- 1.4.5 The Applicant will be responsible for the construction, operation (including maintenance) and eventual decommissioning of the Proposed Development, with the exception of the National Grid Gas compound works (**Work No. 2A**), the works within the National Grid Electricity Transmission 400kV substation (part of **Work No. 3A**), the works within the Northern Powergrid 132kV substation (part of **Work No. 3B**), and the National Grid Carbon compound works (**Work No. 7B**), which will be the responsibility of those named beneficiaries.
- 1.4.6 The Proposed Development includes the equipment required for the capture and compression of carbon dioxide emissions from the generating station so that it is capable of being transported off-site. NGCL will be responsible for the development of the carbon dioxide pipeline network linking onshore power and industrial facilities, including the Proposed Development, in the Humber Region. The carbon dioxide export pipeline does not, therefore, form part of the Proposed Development and is not included in the Application but will be the subject of separate consent application(s) to be taken forward by NGCL.
- 1.4.7 The Proposed Development is designed to be capable of operating 24 hours per day, 7 days a week, with plant operation dispatchable to meet electricity demand and with programmed offline periods for maintenance. It is anticipated that in the event of CCP maintenance outages, for example, it could be necessary to operate the Proposed Development without carbon capture, with exhaust gases from the CCGT being routed via the Heat Recovery Steam Generator (HRSG) stack. Various types of associated and ancillary development further required in connection with and subsidiary to the above works are detailed in Schedule 1 'Authorised Development' of the draft DCO (**Application Document Ref. 2.1**). This along with **Chapter 4: The Proposed Development in the ES Volume I (Application Document Ref. 6.2)** provides further description of the Proposed Development. The areas within which each numbered Work (component) of the Proposed Development are to be built are defined by the coloured and hatched areas on the Works Plans (**Application Document Ref. 4.3**).

1.5 The Proposed Development Site

- 1.5.1 The Proposed Development Site (the 'Order Limits') is located within and near to the existing Keadby Power Station site near Scunthorpe, Lincolnshire and lies within the administrative boundary of North Lincolnshire Council (NLC). The majority of land is within the ownership or control of the Applicant (or SSE

associated companies) and is centred on national grid reference 482351, 411796.

- 1.5.2 The existing Keadby Power Station site currently encompasses the operational Keadby 1 and (under construction) Keadby 2 Power Station sites, including the Keadby 2 Power Station Carbon Capture and Readiness reserve space.
- 1.5.3 The Proposed Development Site encompasses an area of approximately 69.6 hectares (ha). This includes an area of approximately 18.7ha to the west of Keadby 2 Power Station in which the generating station (CCGT plant, cooling infrastructure and CCP) and gas connection will be developed (the Proposed PCC Site).
- 1.5.4 The Proposed Development Site includes other areas including:
- a high pressure gas pipeline to supply the CCGT including a gas compound for NGG apparatus and a gas compound for the Applicant's apparatus;
 - the National Grid 400kV Substation located directly adjacent to the Proposed PCC Site, through which electricity generated by the Proposed Development will be exported;
 - Emergency Vehicle Access Road and Potential Electrical Connection to Northern Powergrid Substation;
 - Water Connection Corridors:
 - Canal Water Abstraction Option which includes land within the existing Keadby Power Station site with an intake adjacent to the Keadby 2 Power Station intake and pumping station and interconnecting pipework;
 - River Water Abstraction Option which includes a corridor that spans Trent Road and encompasses the existing Keadby Power Station pumping station, below ground cooling water pipework, and infrastructure within the River Trent; and
 - a Water Discharge Corridor which includes an existing discharge pipeline and outfall to the River Trent and follows a route of an existing easement for Keadby 1 Power Station;
 - an existing river wharf at Railway Wharf (the Waterborne Transport Offloading Area) and existing temporary haul road into the into the existing Keadby 1 Power Station Site (the 'Additional Abnormal Indivisible Load (AIL) Route');
 - a number of temporary Construction Laydown Areas on previously developed land and adjoining agricultural land; and
 - land at the A18 Junction and an existing site access road, including two existing private bridge crossings of the Hatfield Waste Drain lying west of Palfrey Farm (the western of which is known as Mabey Bridge, to be

replaced, and the eastern of which is termed Skew Bridge) and an existing temporary gatehouse, to be replaced in permanent form.

- 1.5.5 In the vicinity of the Proposed Development Site the River Trent is tidal, therefore parts of the Proposed Development Site are within the UK marine area. No harbour works are proposed.
- 1.5.6 Further description of the Proposed Development Site and its surroundings is provided in **Chapter 3: The Site and Surrounding Area** in ES Volume I (**Application Document Ref. 6.2**).

1.6 The Proposed Development Changes

- 1.6.1 The Applicant has submitted a request (the ‘Change Request’) for the following changes to the Proposed Development, together known as ‘the Proposed Development Changes’.
- 1.6.2 The Proposed Development Changes have resulted from design contractor involvement, which has continued to refine the detail of this ‘First of a Kind’ Project implementation.
- Change No. 1 - Inclusion of riverbed within the Waterborne Transport Offloading Area (Railway Wharf) to be numbered in Schedule 1 of the DCO as **Work 10C**.
 - Change No. 2 – not used^[1].
 - Change No. 3 - Increase to the maximum heights of the carbon dioxide absorbers/ stacks, if two are installed.
 - Change No. 4 - Increase to the maximum heights of the carbon dioxide stripper column.
 - Change No. 5 - Increase in proposed soil import volumes to create a suitable development platform.
- 1.6.3 With the Proposed Development Changes, the Proposed Development Site would cover an area of 69.7 hectares (ha) (a minor increase of 0.3ha in the amount of the Applicant’s land required).
- 1.6.4 At the time of writing the Examining Authority is minded to accept the Change Request (as submitted at Deadline 5 and modified at Deadline 6) as stated in a letter dated 29 April 2022 (**PD-019**) but has requested in the same letter that

^[1] The Applicant previously consulted on and, at Deadline 5, proposed another change (“Change No. 2 - Changes to the Additional Abnormal Indivisible Load Route largely within SSE land and all within existing Order Limits”. This was subsequently withdrawn by the Applicant by letter dated 26 April 2022 (REP6-018) and forms no part of the DCO examination.

all documents and plans comprising the Change Request are submitted, and/or resubmitted, by the Applicant in a single package at Deadline 6a.

- 1.6.5 It is anticipated that following receipt of this single package the ExA will exercise discretion to accept the Change Request and from this point the Proposed Development Changes would form part of the Proposed Development for the remainder of the DCO examination.

1.7 The Development Consent Process

- 1.7.1 As a NSIP project, the Applicant is required to obtain a DCO to construct, operate and maintain the generating station, under Section 31 of the 2008 Act. Sections 42 to 48 of the 2008 Act govern the consultation that the promoter must carry out before submitting an application for a DCO and Section 37 of the 2008 Act governs the form, content and accompanying documents that are required as part of a DCO application. These requirements are implemented through the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) ('APFP Regulations') which state that an application must be accompanied by an ES, where a development is considered to be 'EIA development' under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations).

- 1.7.2 An application for development consent for the Proposed Development has been submitted to the Planning Inspectorate (PINS) acting on behalf of the SoS. Subject to the Application being accepted (which will be decided within a period of 28 days following receipt of the Application), PINS will then examine it and make a recommendation to the SoS, who will then decide whether to make (grant) the DCO.

1.8 The Purpose of this Document

- 1.8.1 The purpose of this document is to set out the measures proposed to mitigate the effects of the Proposed Development on landscape and biodiversity features, to provide a net gain for biodiversity, and to enhance landscape and green infrastructure value of the Proposed Development Site, to secure compliance with relevant national and local planning policies. This LBMEP therefore complements, and provides the outline specifications for realising, the Biodiversity Net Gain (BNG) assessment presented for the Proposed Development in the new **Appendix D**.
- 1.8.2 In order to avoid potential conflicts in approach to impact avoidance and enhancement, this document identifies the measures required for both landscape and biodiversity together, to demonstrate a cohesive strategy.
- 1.8.3 The document is structured as follows:
- Section 2 summarises relevant legislation and planning policy;

- Section 3 describes the existing landscape and biodiversity features and the potential impacts and effects of the Proposed Development;
- Section 4 outlines the requirements for impact avoidance, both during advance works and during the construction phase;
- Section 5 describes the proposals for landscape and biodiversity enhancement and the measures required for their effective management and maintenance. The areas of the Proposed Development Site to which the different proposals will be applied are illustrated in **Figure 1**;
- Section 6 describes the high-level approach to monitoring of the success of the proposed landscape and biodiversity habitat interventions; and
- Section 7 describes the roles and responsibilities of all parties involved in the delivery of the management and enhancement proposals.

2.0 LEGISLATION AND PLANNING POLICY

2.1 Overview

2.1.1 The legislation and planning policy relevant to construction of the Proposed Development and the specification of landscape and biodiversity mitigation and enhancement is listed in this section. This legislation and planning policy have been considered when formulating this Plan. **Appendix 11A: Biodiversity and Nature Conservation Legislation and Planning Policy (ES Volume II – Application Document Ref. 6.3) [APP-076]** provides more details on this relevant legislation and planning policy for biodiversity.

2.2 Legislation

2.2.1 The following legislation has been considered in the preparation of this Plan:

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Wildlife and Countryside Act (WCA) 1981 (as amended);
- Countryside and Rights of Way Act 2000;
- Natural Environment and Rural Communities (NERC) Act 2006;
- Protection of Badgers Act 1992;
- Wild Mammals (Protection) Act 1996;
- Environmental Protection Act 1990; and
- Invasive Alien Species (Enforcement and Permitting) Order 2019.

2.3 Planning Policy

2.3.1 Relevant national planning policy that has been considered in relation to landscape and biodiversity impact avoidance, mitigation and enhancement is as follows:

- Overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change (DECC), 2011a);
- NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b);
- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2021); and
- European Landscape Convention (Council of Europe, 2000).

2.3.2 The local planning policies that are relevant to the Proposed Development Site are set out in the following documents:

- North Lincolnshire Local Plan Saved Policy LC5: Species Protection (NLC, 2003a);
- North Lincolnshire Local Plan Saved Policy LC6: Habitat Creation (NLC, 2003a);
- North Lincolnshire Local Plan Saved Policy LC12: Protection of Trees, Woodland and Hedgerows (NLC, 2003a);
- Emerging North Lincolnshire New Local Plan Policy DQE3p: Biodiversity and Geodiversity (NLC, 2020); and
- Emerging North Lincolnshire New Local Plan Policy DQE8p: Climate Change and Low Carbon Living (NLC, 2020).

2.4 Other Guidance

2.4.1 Other guidance that is relevant context includes:

- North Lincolnshire Supplementary Planning Guidance 3: Design in the Countryside (NLC, 2003b);
- Natural England, Forestry Commission and Department for Environment, Food and Rural Affairs (Defra) Standing Advice on protected sites and species (gov.uk);
- The National Pollinator Strategy (Defra, 2014);
- Local Biodiversity Action Plan (LBAP) for Lincolnshire (Lincolnshire Biodiversity Partnership, 2011);
- Humberhead Levels National Character Area (NCA Profile 39) (Natural England, 2014); and
- North Lincolnshire Landscape Character Assessment and Guidelines (Trent Levels Landscape Character Area and Flat Drained Farmland Landscape Character Type) (NLC, 1999).

3.0 EXISTING LANDSCAPE AND BIODIVERSITY FEATURES AND DEVELOPMENT IMPACTS

3.1 Existing Landscape and Biodiversity Features

3.2 Habitats

3.3 The habitats of relevance to this Plan are described in Appendix 11C: Preliminary Ecological Appraisal Report (ES Volume II – Application Document Ref. 6.3) [**APP-078**].

3.3.1 The permanent and temporary habitat impacts associated with the Proposed Development have been quantified for the purposes of BNG assessment (see **Appendix D**). These are the relevant habitat impacts of relevance to this document and are addressed by the habitat specifications detailed herein. The habitats that would be affected by permanent or temporary land-take comprise:

- ‘modified grasslands’ encompassing species-poor improved and semi-improved neutral grasslands (located at the Proposed PCC Site and the Highway Improvements on the A18); dense scrub comprising stands of mixed scrub and hawthorn dominated scrub (located respectively on the boundary of the Proposed PCC Site with the former Keadby Ash Tip, and in the wayleave of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation)); ephemeral/ short perennial vegetation contributing to open mosaic habitats (OMH) (located on the south-west corner of the Proposed PCC Site where there is a minor overlap with the margin of the former Keadby Ash Tip);
- intensively managed arable farmland (located within areas proposed for temporary construction laydown);
- unvegetated disturbed bare ground (located within the temporary soil storage compound for Keadby 2 Power Station, part of the Proposed PCC Site);
- a minor field ditch (Drain 4 located within Proposed PCC Site);
- watercourses comprising the Hatfield Waste Drain (which is crossed by the existing Mabey Bridge which is to be replaced), and the Stainforth and Keadby Canal (within which the Canal Water Abstraction Option would be constructed);. And
- existing area of hardstanding and other sealed surfaces (located at the Proposed PCC Site with land formerly used as laydown and car parking during construction of Keadby 2 Power Station).

3.3.2 Additional areas of land to be utilised solely for purposes of landscape and biodiversity enhancement are shown on **Figure 1** of this LBMEP. The existing habitats within these landscape and biodiversity enhancement areas (as

mapped and described in **Appendix 11C**, ES Volume II - **Application Document Ref. 6.3**) are:

- 'modified grasslands' of species-poor improved types (located on road verges or in small fields adjacent to the permanent access road off the A18, also includes retained vegetation within the Proposed PCC Site on the alignment of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation); existing tarmac car park (sealed surface) to be broken out and replaced (located adjacent to the permanent access road off the A18); and
- minor field drains (located on the boundaries of the Proposed PCC Site).

3.4 Protected/ Notable Species

3.4.1 Given the limited impacts on habitats, the construction and operation of the Proposed Development also has limited potential in the absence of mitigation, to adversely affect protected and notable species through direct impacts (killing/ injury), disturbance and habitat loss.

3.4.2 The protected species of relevance to this Plan, because of their presence in the potential zone of influence of construction activities, are:

- badger;
- water vole;
- otter (not recorded during baseline surveys but with potential to establish before construction);
- bats (but not bat roosts);
- nesting birds (including ground nesting species); and
- fish.

3.4.3 In addition, drains associated with the Proposed Development Site support the following invasive non-native flora and fauna:

- zebra mussel;
- demon shrimp;
- Nuttall's waterweed; and
- New Zealand pigmyweed.

4.0 IMPACT AVOIDANCE REQUIREMENTS

4.1 Overview

- 4.1.1 The care that has been taken when configuring the layout of the Proposed Development maintains the functionality of existing green infrastructure networks, wildlife networks and habitat linkages. Further information in relation to this is provided in **Appendix D**. The Proposed Development therefore complies fully with the related requirements of planning policy, especially once the additional proposed habitat reinstatement and enhancement measures are also considered (see Section 5).
- 4.1.2 The impact avoidance measures outlined below (Section 4.2 onwards) will be implemented, as relevant and appropriate, prior to and during the construction phase, the purpose being to minimise the impact of works on landscape and biodiversity features.
- 4.1.3 These measures will be applied in order to meet legislative and planning policy requirements for protected species, or as part of standard construction environmental best practice.
- 4.1.4 The commitment to provide these measures has been considered when assessing the likely impacts and effects of the Proposed Development on landscape and biodiversity features in **Chapter 11: Biodiversity and Nature Conservation [APP-054]** including **Chapter 11: Biodiversity and Nature Conservation of the ES Addendum (Document Ref. 6.2.11-Rev 03)** and **Chapter 14: Landscape and Visual Amenity (ES Volume I - Application Document Ref. 6.2) [APP-057]** including **Chapter 14: Landscape and Visual Amenity of the ES Addendum (Document Ref. 6.2.14 - Rev 03)**.
- 4.1.5 Avoidance and mitigation of potential impacts on the environment through, for example, noise, vibration or emissions to air or water associated with the operational Proposed Development are not covered within this Plan. While such impacts could affect biodiversity, these effects have been appropriately controlled and mitigated through the design and impact avoidance measures presented in **Chapter 8: Air Quality [APP-051]** and **Chapter 9: Noise and Vibration [APP-052]** of Environmental Statement (ES) Volume I (**Application Document Ref. 6.2**). In addition, there are other permitting, good practice, legislative, policy and regulatory mechanisms that necessitate the control and prevention of such impacts. The relevant measures are therefore prescribed in other chapters of the ES and do not need to be included within this Plan.

4.2 Protected and Invasive Species Update Surveys

- 4.2.1 Appropriately experienced ecologists will complete site walkovers in advance of mobilisation or other potential advance works to re-confirm the ecological baseline conditions and identify any new ecological risks. Updated species surveys will also be undertaken to determine the status of protected and invasive non-native species (INNS) identified as present or potentially present

at the Proposed Development Site to inform mitigation requirements and support protected species licence applications. These updated surveys will be completed sufficiently far in advance of construction works to account for seasonality constraints and to allow time for the implementation of any necessary mitigation prior to construction.

4.2.2 Existing or potential landscape and biodiversity constraints that will be re-assessed during update surveys are as follows:

- bats – update roost surveys of trees adjacent to the Proposed Development Site;
- breeding birds – nest checks of vegetation to be cleared, where necessary;
- otter – updated survey for signs of presence;
- water vole – updated survey to determine current distribution and population size;
- badger – updated survey to determine current distribution and activity of badger setts; and
- INNS – updated survey to re-confirm the locations of species that may be disturbed during construction.

4.2.3 Should any new protected or invasive species constraints be identified as a result of the updated surveys, the LBMEP would be updated to address these constraints. Any requirement for additional impact avoidance or mitigation will be discussed and agreed with NLC and/ or the relevant statutory consultees, except where this will otherwise be addressed through the process for obtaining any necessary protected species licences.

4.2.4 Any additional surveys will be instructed during the advance works, site clearance and construction phases as identified as necessary by the ecologist, or otherwise as identified and requested by the Applicant or their contractor(s) when implementing the final approved Construction Environmental Management Plan (CEMP) and other relevant approved plans and permits. These may be required, for example, based on the construction programme, working requirements or following identification of specific issues and constraints not covered by previous advice.

4.3 Protected Species Licences

4.3.1 All necessary protected species licences will be applied for and obtained prior to undertaking any works likely to affect the conservation status of these species, as required by the relevant legislation. Based on the findings of **Chapter 11: Biodiversity and Nature Conservation (ES Volume I - Application Document Ref. 6.2) [APP-054]** including **Chapter 11: Biodiversity and Nature Conservation of the ES Addendum (Document Ref. 6.2.11- Rev 03)** and pending the findings of the proposed updated protected species surveys, the following protected species licences may be required:

- badger licence - if direct and indirect disturbance impacts on badger setts are likely and unavoidable (although currently this is not anticipated as likely); and
- water vole licence – if water voles are still present at the time of construction and need to be displaced or relocated from construction working areas.

4.3.2 Habitat compensation/ restoration and enhancement will also be required if a protected species licence is needed. Outline proposals for habitat restoration and enhancement in relation to water vole are included within Section 5 of this LBMEP. It is premature and unnecessary to define similar measures for badger at this time, given this is a highly mobile species. Instead, it is noted that the Applicant has sufficient land within their control to meet any such requirements, including land within the former Keadby Ash Tip.

4.3.3 Should licences be required, it is recognised that this could (a) impose restrictions on the timing of construction activities and (b) dictate lead-in times for agreement and completion of pre-construction mitigation. This will therefore be addressed in the final construction programme based on the findings of the updated surveys.

4.4 Clerk of Works

4.4.1 The Applicant will agree when a Clerk of Works (CoW) should be present during construction in consultation with the ecologist and landscape architect based on relevant environmental commitments, the findings of the updated surveys, the requirements of protected species, and with reference to the relevant project programmes.

4.4.2 Immediately prior to site clearance and the start of construction in each relevant part of the Proposed Development Site, further site walkover surveys will be undertaken by an appropriately experienced CoW to confirm that the risks associated with the Proposed Development Site remain as previously assessed and/ or to confirm the correct implementation of impact avoidance measures (e.g. tree protection fencing, protected species stand-offs and other protection measures).

4.4.3 The scope of the required walkover surveys will be defined on a case by case basis, in consultation with the project team, and NLC or other statutory consultees as necessary, based on the specific risks associated with each relevant part of the Proposed Development and the findings of any preceding updated surveys as detailed above in Section 4.2. This will be controlled and implemented through the final CEMP that will be developed by the contractor. A Framework CEMP is provided as **Application Doc Ref. 7.1 [APP-160]**.

4.4.4 Relevant site staff will receive toolbox talks from the CoW as necessary on the relevant ecological risks present, legal requirements, working requirements necessary to comply with this legislation, and the final approved

landscaping and biodiversity management and enhancement measures. Toolbox talks will be repeated as necessary over the duration of the construction works.

4.5 Tree Works

4.5.1 A full arboricultural survey of the Proposed Development Site, in line with BS5837:2012 will be undertaken concurrently with the detailed design, to identify where any trees are likely to be affected by the construction works and to inform the development of the detailed design and specification of tree root protection zones.

4.5.2 Where works in close proximity to retained trees cannot be practicably avoided, these works will be undertaken in accordance with current best practice. At the time of issue of this LBMEP, current best practice is defined in:

- British Standard (BS) 5837: 2012 Trees in relation to design, demolition and construction – Recommendations (British Standards Institute, 2012); and
- National Joint Utilities Group (NJUG) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (NJUG, 2007).

4.5.3 Necessary protective fencing will be installed as required and prior to the commencement of site clearance or construction works in proximity to trees, as will be set out in the Arboricultural Report to be produced following the detailed pre-construction tree surveys and to be detailed as part of the Arboricultural Method Statement.

4.6 Built Structures

4.6.1 The following impact avoidance measures in relation to built structures are highlighted as part of the landscape and visual amenity assessment (**Chapter 10: Landscape and Visual Amenity (ES Volume I - Application Document Ref. 6.2) [APP-057]**) and will be taken into consideration as part of the detailed design of the Proposed Development. Implementation of these measures is secured by a Requirement of the draft DCO (**Application Document Ref. 2.1) [APP-005]**):

- suitable materials will be used, where reasonably practicable, in the construction of structures to reduce reflections and to assist with breaking up the massing of the buildings and structures;
- the selection of finishes for the buildings and other infrastructure will be informed by the finishes of the adjacent developments including Keadby 2 Power Station, in order to reduce the visual impact of the Proposed Development including using lighter coloured materials on the taller structures to enable them to recede against the sky. Finishes and

materials will be agreed with relevant consultees and approved by NLC at the detailed design stage, secured through a Requirement of the draft DCO, in order to minimise the visual impact of the Proposed Development;

- lighting required during the construction and operation stages of the Proposed Development will be designed to reduce unnecessary light spill outside of the Proposed Development Site boundary, in accordance with the Indicative Lighting Strategy (**Application Document Ref. 5.11**) [**APP-040**]; and
- where existing vegetation is present along the Proposed Development Site boundary, this will be retained, as far as reasonably practicable, and managed to support its continued presence to aid the screening of low level views into the Proposed Development Site.

4.7 Precautionary Working Methods

4.7.1 The following precautionary working methods will be employed to minimise potential adverse effects on protected/ notable species prior to and during construction. Precautionary working method statements will be produced as necessary to specify working requirements and other necessary impact avoidance measures. These measures would be controlled and implemented through the final CEMP) that will be developed by the contractor. The CEMP is secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**]. A Framework CEMP is provided as **Application Doc Ref. 7.1** [**APP-160**].

4.7.2 The measures set out below for individual species will be implemented in a manner that avoids conflicts with requirements for other relevant species that may occupy the same habitats. As an example, nesting bird mitigation will be implemented in a manner that is consistent with the mitigation required for water vole.

4.7.3 An appropriately qualified CoW will review and advise on the requirements for precautionary working methods to be implemented within each part of the Proposed Development Site and will supervise implementation of the required measures.

Water Vole

4.7.4 An appropriate Water Vole Impact Avoidance Strategy will be prepared with reference to updated survey data and agreed with relevant stakeholders. It will set out all of the measures and supervision required to deliver legislative compliance during construction of the Proposed PCC Site and watercourse crossings. Prior submission and approval of the Water Vole Impact Avoidance Strategy is a commitment of the Framework CEMP provided as **Application Doc Ref. 7.1** [**APP-160**].

4.7.5 The Water Vole Impact Avoidance Strategy will address (as relevant):

- loss of the sub-optimal habitat associated with the drain crossing Keadby Common, where one water vole territory was identified based on surveys in May and August 2020;
- minor works on Glew Drain at the location of the proposed bridge crossing for the Emergency Vehicle Access Road, where localised evidence of water vole was found in May and August 2020;
- replacement of Mabey Bridge at the site access off the A18 (no evidence of water vole found during baseline surveys); and
- minor works for installation of the potential 132kV electrical connection to Northern Powergrid Substation) required over Glew Drain and Keadby Common Drain, where water vole has been recorded.

4.7.6 The Water Vole Impact Avoidance Strategy will include:

- the latest updated survey data for relevant field drains;
- requirements for ongoing further surveys, ongoing monitoring and attendance by an appropriately experienced CoW;
- appropriate construction stand-offs from watercourses that will be maintained at all times (retained watercourses) or, in the case of watercourse crossings, until such time that the CoW advises that the relevant construction works can proceed;
- options for micro-siting to avoid water vole and its burrows;
- appropriate timings to minimise potential for disturbance impacts on water vole;
- requirements for habitat mitigation and enhancement to accommodate any water voles displaced as a result of land take for the Proposed Development;
- requirements (if relevant) for displacement, trapping, exclusion and relocation of water voles from relevant construction areas (although based on current data confirming only a very small and localised water vole presence on relevant drains, the adjacent retained and enhanced areas of drain habitat are anticipated to be sufficient to accommodate any water voles displaced);
- site inductions and toolbox talks as appropriate; and
- any protected species licence needed to permit the relevant construction works to proceed. If a licence is required, then enhancement proposals for water vole are likely to be needed to secure this licence. Proposals for water vole enhancement are already allowed for and outlined within this LBMEP, which will also benefit other freshwater biodiversity.

Nesting Birds

4.7.7 The following approach would be taken to deliver legislative compliance in relation to nesting birds:

- relevant grassland areas will be mown short (<5cm) prior to commencement of the breeding season (typically March-August inclusive for most species), and then mown weekly to maintain this short sward height until vegetation clearance. By so doing, ground nesting birds are unlikely to attempt to nest within construction areas;
- all clearance of other suitable vegetation will be undertaken outside the breeding season (typically March-August inclusive for most species), where possible;
- where there will be a gap in activity between site clearance/ soil stripping and the start of construction, then all cleared ground will be maintained in a disturbed state (e.g. through regular harrowing to minimise the risk of ground nesting birds establishing in the lead into construction.
- site inductions and toolbox talks will be provided as appropriate;
- in situations where the above breeding bird mitigation is not possible, an appropriately experienced CoW will check the working area for nests before works commence. If active nests are discovered through this process, then the CoW will advise on appropriate mitigation to ensure that these are not impacted by construction activities. All relevant works will be completed in accordance with this advice and under the supervision of the CoW; and
- consistent with the above, should WCA Schedule 1 bird species be present at the time of construction (to be determined through the committed pre-commencement update surveys) the CoW will advise on species-specific requirements to achieve legislative compliance.

Fish

4.7.8 A Fish Management Plan will specify the measures and supervision required to deliver legislative compliance during installation and drawdown of any cofferdam for (depending on the final option selected) the upgrade of the River Water Abstraction Option or the Canal Water Abstraction Option.

4.7.9 As all construction works within watercourses are subject to regulation and permitting regimes, the Fish Management Plan will be prepared and agreed with the relevant regulator (Environment Agency and/or Marine Management Organisation).

4.7.10 The Fish Management Plan will include details of:

- appropriate timings to minimise potential for capture of sensitive fish species e.g. migratory fish;

- provision for screening of pump intakes to prevent fish being drawn into the pipe/ pump;
- supervision of dewatering of any cofferdam(s) by an appropriately experienced CoW to oversee fish welfare and to support the relocation of any stranded fish or associated wildlife back to the main channel of the relevant watercourse outside the working area; and
- if appropriate, e.g. to meet additional requirements of the relevant regulators, other specialist techniques to support the capture and relocation of fish to the main channel of the relevant watercourse outside the working area prior to drawdown.

Invasive Non-native Species

- 4.7.11 An updated terrestrial plant INNS survey will be completed prior to site clearance to determine the current location and extent of these INNS within the Proposed Development Site (noting that none were present at the time of the baseline survey).
- 4.7.12 It will be assumed that aquatic plant and invertebrate INNS are present in all watercourses affected by construction, regardless of the scale of the proposed construction works.
- 4.7.13 An Invasive Species Management Plan (ISMP) will be prepared to address all relevant INNS to accompany the final CEMP and will be agreed with relevant stakeholders. The ISMP will specify the control/ eradication (as reasonable and practicable), biosecurity measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations. Prior submission and approval of the ISMP is a commitment of the Framework CEMP provided as **Application Doc Ref. 7.1 [APP-160]**.
- 4.7.14 Biosecurity requirements will address all potential pathways for interaction with and dispersal of INNS, including movements of vehicles, machinery and staff:
- into the Proposed Development Site from third party locations, e.g. during construction mobilisation;
 - between different parts of the Proposed Development Site, most especially between different watercourses; and
 - from the Proposed Development Site for redeployment elsewhere.

4.8 Animal Welfare Requirements

- 4.8.1 Mammal/ badger gates will be installed in boundary fences as appropriate to maintain access for nocturnal wildlife into and through the habitat corridor associated with the existing overhead electricity transmission lines connected to the existing National Grid 400kV Substation. Further details will be provided once the locations and alignment of boundary fences has been specified

further and confirmed, and these details will be submitted in the final LBMEP to be agreed as a Requirement of the draft DCO (**Application Document Ref. 2.1**) [APP-005].

4.8.2 Vegetation clearance and construction excavations have potential to result in offences under animal welfare legislation. A CoW will be employed to supervise all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance.

4.8.3 All excavations will be covered overnight, or where this is not practicable, a means of escape will be fitted e.g. battered soil slope or scaffold plank, to provide an escape route should any animals (e.g. grass snake, badger, brown hare, hedgehog) stray into the construction area and fall into an excavation.

4.9 Lighting

4.9.1 Construction temporary lighting will be arranged so that glare is minimised outside the Proposed Development Site as far as reasonably practicable. Measures to minimise the impact of lighting are detailed in the Lighting Strategy (**Application Document Ref. 5.11**) [APP-040] and Framework CEMP (**Application Document Ref. 7.1**) [APP-160].

4.10 Habitat Reinstatement

4.10.1 Terrestrial habitats that may experience temporary or otherwise trivial levels of access and disturbance during construction, mainly comprising small areas of species-poor road verge and flood bank grassland and arable farmland, will be reinstated (i.e. returned to a condition consistent with the existing baseline) following the completion of construction. This includes land affected by the A18 highway improvements, installation of an eel screen and the Potential 132kV Electrical Connection to Northern Powergrid 132kV Substation option, and use of arable fields for construction laydown. As this land is not in the permanent control of the Applicant, no ecological enhancement measures are proposed within these areas.

4.10.2 Some habitats removed during construction of permanent infrastructure will also be restored. These areas will remain within the permanent control of the Applicant so will be managed with the aim of increasing (relative to the existing baseline) their biodiversity value. This includes land within and immediately adjacent to the Proposed PCC Site on Keadby Common where the existing species-poor improved grassland and unvegetated disturbed ground will be sown with a locally appropriate native wildflower meadow mixture and appropriately managed thereafter. Such measures are included within the habitat enhancement proposals detailed in Section 5.

4.10.3 The following areas will be reinstated to the original baseline conditions.

Arable Fields Used for Construction Laydown

- 4.10.4 The arable fields used for construction laydown will be reinstated back to arable farmland in accordance with the requirements of the landowner.

Land Affected by the Existing Temporary AIL Road

- 4.10.5 The vegetation in this area was originally cleared for construction of Keadby 2 Power Station, so there is no new habitat loss for the Proposed Development and instead there is only a deferral of the date for habitat reinstatement. The responsibility and timescales for delivering this habitat reinstatement are currently controlled by conditions on planning permission PA/2019/1595 as varied by planning permission PA/2021/188. Under the draft DCO, it is proposed that these permissions will effectively be extended, and the matters controlled by condition will be secured by equivalently worded requirements in Schedule 2 of the draft DCO (**Application Document Ref. 2.1**) [APP-005].

- 4.10.6 Given the existing requirements, restoration of the land affected by the existing temporary AIL Route cannot contribute to BNG for the Proposed Development as it does not represent additionality. Therefore, the existing haul road has been treated as no change within the BNG assessment.

- 4.10.7 The original baseline conditions (prior to establishment of the existing temporary AIL Route) present in this area were agricultural land, two species-poor native hedgerows on the eastern and western boundaries of the field, and below each of these hedgerows (where temporary bridges are currently located) were small field drains supporting emergent plant species.

- 4.10.8 During reinstatement:

- the two drain crossings will be removed, and the banks profiled consistent with adjacent unaffected sections of drain (if required);
- the short sections of drain bank exposed by the above works will be sown with a low maintenance grass seed mixture to provide bank stabilisation and minimise potential for erosion while other vegetation present in adjacent areas re-colonises;
- re-establishment of aquatic vegetation within the drains will be left to natural processes, as suitable plant species are present nearby in unaffected sections of drain;
- the field will be returned to agricultural land using a basic agricultural grass seed mixture in accordance with the preferences of the landowner; and
- the access points through the two boundary hedgerows will be planted with a species-rich (i.e. a minimum of five species) mixture of native shrubs planted as a double staggered row.

- 4.10.9 The planting mixture for the species-rich hedgerows will comprise native flower and fruit-bearing species suitable to the location as listed below:

- hawthorn (*Crataegus monogyna*);
- blackthorn (*Prunus spinosa*);
- field maple (*Acer campestre*);
- dogwood (*Cornus sanguinea* subsp. *sanguinea*);
- guelder rose (*Viburnum opulus*);
- dog rose (*Rosa canina* agg.); and
- osier (*Salix viminalis*).

4.10.10 At least 50% of the planting stock will comprise hawthorn, with all other species contributing no more than 50% in aggregate.

4.10.11 The hedgerow planting method will be as follows:

- plants will be two-year-old transplants at least 450 millimetres (mm) to 600mm high;
- species will be planted so that no one species makes up more than 70% of the total;
- planted in a staggered double row 350mm apart with a minimum of seven plants per metre;
- plantings will be kept clear of weeds until they are established; and
- plantings will be fitted with an appropriate timber stake and a plastic-free biodegradable shrub shelter (all fitted as per manufacturer's recommendations).

4.10.12 The hedgerow will be subject to the draft aftercare maintenance regimes described in **Appendix C**, in which any plants found to be dead or dying within the initial five-year aftercare period will be replaced within the first available planting season.

4.10.13 The newly planted hedgerow will be trimmed in at least the first two aftercare years to encourage bushy growth, allowing the hedge to become taller and wider at each cut.

4.10.14 After the aftercare period, the landowner or agricultural tenant will become responsible for the long-term management and aftercare of all habitats in this area. Where the landowner remains the Applicant, then the hedgerow enhancement management regimes specified in **Section 5** will be extended to cover this area. This will be reviewed and clarified in the final LEMP.

Drains Crossed by Electrical Connections

4.10.15 If the Potential Electrical Connection to the 132kV Northern Powergrid Substation is required, then the associated crossings of minor field drains will be undertaken using small-scale cut and cover methods over an anticipated 6-month period.

- 4.10.16 Following reinstatement of bank substrates and profiles, the affected areas will be sown with a low maintenance grass seed mixture to provide bank stabilisation and minimise potential for erosion while other vegetation present in adjacent areas re-colonises.
- 4.10.17 Re-establishment of aquatic vegetation within the drains will be left to natural processes, as suitable plant species are present nearby in unaffected sections of drain.

River Trent Flood Bank

- 4.10.18 It is anticipated that the activities at the River Water Abstraction Option (if required) will largely be confined to within the existing compound and works to be completed from a boat. However, it is possible that limited access may be required to the flood bank to either side of the compound.
- 4.10.19 The flood bank is currently managed as closely mown species-poor improved grassland. Any areas within the Proposed Development Site boundary that are disturbed during construction will be sown with a low maintenance grass seed mixture.

Stainforth and Keadby Canal

- 4.10.20 The bank-top construction activities at the Canal Water Abstraction Option (if required) will be confined to within the existing compound/ hardstanding previously used for construction of the Keadby 2 Power Station cooling water intake. No re-instatement of habitats was required for the preceding Keadby 2 Power Station. Given this, no new impacts on semi-natural habitats are anticipated for construction of the Proposed Development and habitat reinstatement is not considered necessary.
- 4.10.21 Vegetation establishment will be left to natural processes, consistent with the historic baseline (before works for Keadby 2 Power Station and as visible in Google Earth) of hardstanding and ruderal vegetation.

Highway Improvements at the Access off the A18

- 4.10.22 There is potential for localised disturbance of existing species-poor grassland verges and banks for temporary short-duration laydown, vehicle access, as well as ground disturbance works to install foundations for the replacement of Mabey Bridge. Works for the latter would be largely confined to the footprint of the existing Mabey Bridge.
- 4.10.23 Any vegetation disturbed by the above activities will be reinstated as set out above for the drains crossed by the Potential Electrical Connection to the 132kV Northern Powergrid Substation. In addition, land on the north side of Mabey Bridge is included within a larger area allocated for biodiversity enhancement, as described in Section 5 of this LBMEP.

5.0 LANDSCAPE AND BIODIVERSITY ENHANCEMENT

5.1 Approach

- 5.1.1 The landscape and visual amenity assessment presented in **Chapter 14: Landscape and Visual Amenity (ES Volume I - Application Document Ref. 6.2) [APP-057]** including **Chapter 14: Landscape and Visual Amenity of the ES Addendum (Document Ref. 6.2.14 - Rev 03)** concludes that the Proposed Development will result in significant adverse effects on visual amenity from Viewpoint 1 (Chapel Lane West, Keadby), Viewpoint 2 (Gate Keepers Residence, Vazon Bridge, Keadby) and Viewpoint 4 (PRoW (KEAD9, KEAD10) north of Keadby) and in the event of a future baseline without the Keadby 1 Power Station built structure, for the operation assessment scenario for Viewpoint 6 (Trunk Road, Keadby). However, the opportunity for mitigation of the visual effects of the Proposed Development is limited due to the size and scale of the Proposed Development. As shown in the assessment, the effects on visual amenity largely relate to the height of the tallest structures; as such it is considered that the addition of landscape features such as trees and woodland would not be effective in reducing the effects of these on visual amenity. However, there remains a need for appropriate restoration of the landscape following construction, and enhancements to the landscape character and improvements to the green infrastructure network to meet requirements of local and national planning policy. Existing vegetation provides screening and softening of views of lower structures from non-industrial viewpoints.
- 5.1.2 The ecological impact assessment presented in **Chapter 11: Biodiversity and Nature Conservation (ES Volume I - Application Document Ref. 6.2) [APP-054]** including **Chapter 11: Biodiversity and Nature Conservation of the ES Addendum (Document Ref. 6.2.11 - Rev 03)** identified no potentially significant adverse effects as a result of the temporary and permanent loss of habitat during construction. Habitat restoration and enhancement is proposed to maintain and improve habitats for biodiversity. This includes benefits for two Local Wildlife Sites (LWS).
- 5.1.3 Proposals for landscape and biodiversity enhancement have been designed to achieve the following outcomes:
- no net loss of biodiversity and a quantifiable gain for biodiversity as a result of the Proposed Development;
 - enhance field drain habitats for the benefit of water vole to compensate for temporary and permanent losses of habitat to the Proposed Development;
 - enhance the Hatfield Waste Drain and Stainforth and Keadby Canal for aquatic wildlife, birds, pollinators and other species;
 - enhance grassland habitats for the benefits of pollinators and other invertebrates, birds, badger, brown hare and other species;

- provide nesting and roosting features for birds and bats to address a general lack of natural features in the local area to meet this need; and
- enhance the habitat and green infrastructure network adjacent to and through the Proposed Development Site, including provisions of habitats connected to two LWS and the former Keadby Ash Tip.

5.2 Habitat Enhancements

5.2.1 Measures to enhance the biodiversity and green infrastructure value of the Proposed Development Site through establishment of new habitats and improvement of existing habitats are proposed. The areas to be enhanced are shown on **Figure 1** and described below. Once created the new habitats will be appropriately maintained (as described below) for a minimum period of 25 years (the proposed lifetime of the Proposed Development).

Habitat Creation Principles Supporting Delivery of Biodiversity Enhancement

5.2.2 Where new native habitats are to be created, or new native planting undertaken, the following principles will apply:

- all seed mixes and planting stock will be ordered as early as reasonably practicable following a decision to commence the project to allow supply to be met without risk of substitution;
- all seed mixes and planting stock will be sourced from a specialist producer of British grown native plants and/ or seed who can source-identify all stock (i.e. not a non-specialist nursery that buys in stock or an agricultural/general merchant that buys stock from diverse sources, including non-British sources); and
- terms of supply will include a condition that no part of the order shall be substituted with stock of alternative species or origin and that any change must be mutually agreed.

5.2.3 The above requirements will be incorporated into contractor specifications and contracts, as appropriate, to deliver genuinely native plantings in accordance with the biodiversity objectives of this LBMEP.

Enhancement Proposals

Proposed PCC Site – Grassland Habitat Creation

5.2.4 Keadby Common currently contains species-poor improved grassland habitat ('modified grassland'), all of which will be removed prior to construction. Post-construction, there will be areas of land around the perimeter of the Proposed PCC Site, both inside and outside the security fence, that are suitable for use to provide biodiversity enhancement and visual amenity. As a minimum, 3ha of species-rich neutral grassland will be established within and adjacent to the

Proposed PCC Site. Options to increase this further will be considered at detailed design stage, see Section 5.3.

- 5.2.5 These areas will be sown with a site-appropriate native neutral wildflower grassland. An indicative seed mixture suitable for this purpose is the Emorsgate EM4 Meadow Mixture for Clay Soils. The composition of this grassland is detailed in **Appendix A**.
- 5.2.6 The regular mowing and removal of arisings from the existing grassland appears to have depleted nutrient levels in the former arable soils sufficiently for the successful establishment of wildflower grassland. In addition, the removal and storage of soils during construction allows control over what substrates are returned post-construction. Given this, topsoil will not be reinstated in areas where grassland will be seeded and consequently soil testing is not considered necessary. The same principles will apply if soils need to be imported to raise ground levels to establish a platform for the Proposed PCC Site.
- 5.2.7 Ground will be suitably prepared in advance of seeding. Management, in the first year (potentially extending into Year 2, depending on the time of sowing and rate of establishment), will be in accordance with the aftercare regime recommended by the seed producer. This will involve:
- periodic mowing in the first year after sowing to maintain a sward height of 40-60mm, removing all arisings for disposal in a location pre-agreed with the ecologist or landscape architect where this would not conflict with biodiversity objectives and habitat management;
 - spot treatment of perennial weeds such as broad-leaved dock (*Rumex obtusifolius*), creeping thistle (*Cirsium arvense*) and spear thistle (*Cirsium vulgare*) with an approved herbicide;
 - a review of requirements for Year 2 at the end of aftercare Year 1, moving into the long-term nature conservation management regime (see below) if appropriate.
- 5.2.8 After the initial aftercare period of management, the grassland will be maintained through a nature conservation regime. The regime will be specified in the final LBMEP with reference to the final layout for the Proposed PCC Site but will allow for:
- mowing of plots on rotation so that in any one year there always remains areas of longer tussocky grassland suitable to provide foraging habitat for barn owl and other birds, and places of refuge for other wildlife, e.g. over-wintering invertebrates, when the remainder of the grassland is cut;
 - mowing grassland to 50mm height between late July and early September, with all arisings removed;
 - a second cut, if required (not likely to be necessary given existing substrates but this will be determined later through monitoring) in April to

reduce the vigour of grass species and maximise flower production by herb species;

- periodic control of scrub cover if it establishes greater than 10% total cover, and pernicious weeds such as creeping thistle, spear thistle and broad-leaved dock where these start to dominate to the exclusion of other flora; and
- all arisings will be deposited in a suitable area in the wider landholding (as agreed with the ecologist or landscape architect) to create habitat piles suitable for use by grass snake for egg laying.

5.2.9 The above low intensity management regime will also be extended to an area of retained species-poor grassland within the wayleave for the existing overhead electricity transmission lines associated with the existing National Grid 400kV Substation. This area of grassland is not included within the area of habitat used to calculate the biodiversity net gain (i.e. it has been treated as 'retained' in the assessment) as without re-seeding it is not certain how quickly the grassland will respond to the beneficial change in management. With the enhancements proposed, it is possible to demonstrate a biodiversity net gain without a need to account for this area; inclusion of this small additional plot therefore represents an additional beneficial measure over and above the stated gain.

5.2.10 Allowance will also be made for a native scrub component within all of the above grassland areas. This will result in grassland habitat of more diverse structure and consequently of higher biodiversity value than uniformly open grassland.

5.2.11 The planting mixture will comprise native flower and fruit-bearing species suitable to the location, as indicated by the existing baseline within the Proposed PCC Site and on adjacent land. Native species suitable to this location include:

- hawthorn (*Crataegus monogyna*);
- dog-rose (*Rosa canina* agg.);
- sweet-briar (*Rosa rubiginosa*);
- dogwood (*Cornus sanguinea* subsp. *sanguinea*);
- wild privet (*Ligustrum vulgare*);
- spindle (*Euonymus europaeus*); and
- buckthorn (*Rhamnus cathartica*).

5.2.12 The extent of scrub will not contribute more than 5% of the total grassland cover and will be located so as not to impede implementation of the specified grassland management regimes.

- 5.2.13 All scrub planting will be notch planted at 1.5m and 2.5m spacings and a plastic-free biodegradable spiral and stake. All new scrub planting will be subject to the maintenance regimes described in **Appendix C**.
- 5.2.14 The establishment of species-rich grassland and its associated integral scrub will be monitored by an ecologist and a landscape architect as set out in Section 6.

Proposed PCC Site – Attenuation Pond

- 5.2.15 In addition to the above grassland enhancements, the indicative site layout includes a surface water attenuation pond. The design of the attenuation pond will be secured as a requirement of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**] but the current preference is for a concrete attenuation pond, possibly with a thin overlaying layer of soil, to minimise maintenance requirements going forward. Given this, the attenuation pond is only likely to accrue a minor incidental biodiversity value and minimal emphasis is therefore placed upon it for the purpose of this LBMEP.

Land Immediately West of the North Pilfrey Bridge and North of Mabey Bridge – Grassland Habitat Enhancement

- 5.2.16 Between the existing site access road and the South Soak Drain is a broad verge/ small fields that are currently species-poor improved grassland ('modified grassland') maintained through regular mowing. There is a similar triangular area of grassland adjacent to Mabey Bridge. These grasslands can be enhanced following construction to create a minimum of 3.3ha of species-rich neutral grassland. This location connects to the Stainforth and Keadby Canal Corridor LWS, so the proposed new grassland will enhance the LWS.
- 5.2.17 The regular mowing and removal of arisings from the existing grassland is likely to have depleted nutrient levels in the former arable soils sufficiently for the successful establishment of wildflower grassland, but soil testing will be undertaken to confirm this and as a basis for agreement of the final specification.
- 5.2.18 There is also an existing 0.5ha car park currently in use for the construction of Keadby 2 Power Station. The current planning permission (reference PA/2018/1950) requires the restoration of the 'Site' on or before 21 November 2022 after which it is intended that it be broken out and reinstated to a suitable condition consistent with the adjacent land-use (the improved grassland). However, under the draft DCO, it is proposed that this permission will effectively be extended to allow this area to be beneficially used as laydown for the Proposed Development. The matters controlled by condition, including a later date of reinstatement, will be secured by equivalently worded requirements in Schedule 2 of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**]. It is also proposed that this area be used for species-rich

neutral grassland habitat creation rather than simply reinstated to its former condition, so the proposed approach will deliver additionality.

- 5.2.19 Following completion of construction activities for the Proposed Development, the existing grassland turf, and the hardstanding of the car park, will be removed to allow ground preparation and sowing with a site-appropriate native neutral wildflower grassland. Pending the results of soil testing it is expected that this grassland will also be of a type comparable with the Emorsgate EM4 Meadow Mixture for Clay Soils (see **Appendix A**).
- 5.2.20 The ground will be suitably prepared in advance of seeding. Once sown, the management regimes specified above for Area 1 will be applied. Monitoring will also be as specified above for Area 1.
- 5.2.21 The establishment of species-rich grassland will be monitored by an ecologist and a landscape architect as set out in Section 6.

Mabey Bridge and North Pilfrey Bridge – Scrub Creation

- 5.2.22 A stand (0.2ha) of dense mixed scrub, with a subsidiary contribution from standard trees, will be planted by Mabey Bridge to compensate for losses of scrub elsewhere during construction and to enhance the riparian corridor next to the Hatfield Waste Drain. The final planting specification for this scrub will reflect the diversity of species included in the hedgerow planting but will be appropriate to the space available.
- 5.2.23 The planting mixture will comprise native flower and fruit-bearing species suitable to the location, as indicated by the existing baseline within the Proposed PCC Site and on adjacent land. Native species suitable to this location include:
- hawthorn (*Crataegus monogyna*);
 - dog-rose (*Rosa canina* agg.);
 - sweet-briar (*Rosa rubiginosa*);
 - dogwood (*Cornus sanguinea* subsp. *sanguinea*);
 - wild privet (*Ligustrum vulgare*);
 - spindle (*Euonymus europaeus*);
 - buckthorn (*Rhamnus cathartica*); and
 - wild cherry (*Prunus avium*) – up to 5 standard trees to increase the structural diversity of the planting as enhancement of the Hatfield Waste Drain.
- 5.2.24 A comparable scrub planting (excluding wild cherry) will also be planted adjacent to North Pilfrey Bridge (0.1ha).

- 5.2.25 All scrub planting would be notch planted at 1.5m and 2.5m spacings and protected with a plastic-free biodegradable spiral and stake.
- 5.2.26 The scrub planting would be subject to the draft maintenance regimes described in **Appendix C**, in which any plants found to be dead or dying within the initial five-year aftercare period will be replaced within the first available planting season. Following the completion of an initial five-year aftercare period all new planting plots will undergo a biannual condition assessment and an appropriate programme of works developed to address changes in condition and site requirements. Such work may include additional replacement planting, fence repair/ removal, pruning, coppicing, or thinning out of plots to encourage establishment.
- 5.2.27 The establishment of scrub will be monitored by an ecologist and a landscape architect as set out in Section 6.

Access Road – Species-rich Native Hedgerow Creation

- 5.2.28 There is an existing hedgerow on the eastern margin of the central section of the existing site access road between Mabey Bridge and North Piffrey Bridge. Additional plantings of 500m total length are proposed to extend the existing hedgerow at its northern and southern ends, and to connect with areas of scrub planting (see above).
- 5.2.29 The planting mixture will comprise native flower and fruit-bearing species suitable to the location. The final species selection will be made from the list of shrub species provided above for the new scrub habitat, with up to 50% of the planting stock comprising common hawthorn, and all other species contributing no more than 50% in aggregate.
- 5.2.30 The hedgerow planting method will be as follows:
- plants will be two-year-old transplants at least 450 millimetres (mm) to 600mm high;
 - species will be planted so that no one species makes up more than 70% of the total;
 - planted in a staggered double row 350mm apart with a minimum of seven plants per metre;
 - plantings will be kept clear of weeds until they are established; and
 - plantings will be fitted with an appropriate timber stake and a plastic-free biodegradable shrub shelter (all fitted as per manufacturer's recommendations).
- 5.2.31 The newly planted hedgerow will be trimmed in at least the first two years to encourage bushy growth, allowing the hedge to become taller and wider at each cut.

- 5.2.32 Once established the hedgerow will be managed so it attains a minimum average height and width of 1.5m. To achieve this the hedgerow will be trimmed no more frequently than once every other year.
- 5.2.33 Trimming will be timed for during January and February when the majority of fruit has been taken by local wildlife and carried out according to best practice guidance. Access for this is possible via the existing site access road.
- 5.2.34 The sides, ends and tops of the hedgerow will be trimmed as far as practicable to achieve an 'A' profile.
- 5.2.35 Following trimming operations all significant arisings (cuttings) will be removed so as not to impede grassland growth or management.
- 5.2.36 The establishment of the hedgerow will be monitored by an ecologist and a landscape architect as set out in Section 6.

Keadby Common Drains

- 5.2.37 The final LBMEP, secured through a Requirement of the draft DCO (**Application Document Ref. 2.1**) [APP-005], will include details of a programme of field drain enhancement works to re-instate areas with open water more suitable to support a greater range of aquatic biodiversity, including water vole. The target drains are those on the southern, eastern and western boundaries of Keadby Common (790m total length).
- 5.2.38 The programme of enhancement works will commence before the start of the main construction period to provide enhanced habitat suitable for occupation by any water voles present at that time within the field drain (Drain 4) to be infilled during construction.
- 5.2.39 The enhancement works will be planned to avoid any water vole burrows present at that time. Given existing survey data the sub-optimal habitat conditions currently present, water voles are not anticipated to be a significant constraint at the time of these works.
- 5.2.40 The following specific actions will be included in the final LBMEP:
 - removal of excess silt and emergent (swamp) vegetation to re-instate open water conditions;
 - cutting back of overhanging trees to reduce over-shading, in support of the successful establishment of aquatic vegetation suitable to sustain a more diverse faunal assemblage, including water vole;
 - possible tie-in with the surface water drainage scheme for the Proposed Development to improve water supply;
 - sowing of adjacent land, as described above, with species-rich wildflower grassland.

Stainforth and Keadby Canal

5.2.41 The canal is currently of relatively low biodiversity value due to a lack of marginal vegetation and a natural bank structure. Therefore in order to mitigate the very small impact from the proposed Canal Water Abstraction Option, it is proposed that the adjacent section of the northern margin of the canal be enhanced to provide a linear stand of wetland marginal vegetation.

5.2.42 To achieve this pre-planted coir rolls will be installed by a specialist contractor within the marginal zone along the north bank. The installation method will be suitable to the site and bank conditions.

The establishment of the aquatic plants within the coir rolls will be monitored by an ecologist and a landscape architect as set out in Section 6. Species Specific Measures

5.2.43 Additional enhancement measures for species are proposed within the Proposed Development Site and the adjacent former Keadby Ash Tip. The latter is also land within the control of the Applicant. Habitat creation is not appropriate in this area given the existing biodiversity value (see **Appendix 11C: Preliminary Ecological Appraisal Report, ES Volume II – Application Document Ref. 6.3) [APP-078]** including in **Appendix 11C: Preliminary Ecological Appraisal Report of the ES Addendum (Document Ref 6.2.11 - Rev 03** and currently there is no anticipated need for habitat management or intervention over the medium-term.

5.2.44 The following species features will be provided:

- 3 No. pole mounted barn owl towers - located on Figure 1 and specified in **Appendix B**;
- 5 No. Schwegler 1FD or comparable bat boxes suitable for maternity roosting – to be located on suitable trees within the former Keadby Ash Tip;
- 5 No. Schwegler 2F universal bat boxes, or comparable boxes – to be located on suitable trees within the former Keadby Ash Tip;
- 5 No. tawny owl nesting boxes (suitable also for other bird species requiring larger nesting cavities) – to be located on suitable trees within the former Keadby Ash Tip; and
- ring-barking of suitable trees within the former Keadby Ash Tip to enhance the resource of standing deadwood available to willow tit.

5.2.45 The target species listed above are those that require mature trees or standing deadwood for roosting or nesting, conditions that are currently absent or in short supply due to the relatively young age of the woodland and scrub present within and adjacent to the Proposed Development Site.

- 5.2.46 Prior to submission and agreement of final specifications with NLC, an ecologist will undertake a walkover survey to identify suitable locations for the identified interventions. These locations will be marked on a plan to accompany the final specification.
- 5.2.47 Once installed, the artificial barn owl, bird and bat boxes will be inspected annually in January or February to confirm their ongoing presence and to identify any requirements for remedial action. All artificial boxes that cannot be re-found, that are found to be damaged, or that require other remedial action will be replaced/ rectified before the end of March in the same year, subject to the commercial availability of suitable replacement features to meet this deadline.

5.3 Comparison of Permanent Habitat Losses and Gains

- 5.3.1 A comparison to the balance between habitat losses and gains is provided within the BNG assessment (Appendix D). Therefore, the purpose of this LBEMP is only to set out the specifications proposed to achieve the intended BNG outcome.
- 5.3.2 The assessment of the balance between habitat losses and gains has been based on the provision of the identified habitat creation measures in all of the indicative areas shown on **Figure 1**, although not all of this land would be required to achieve the stated gain. The location and extent of land for biodiversity enhancement is subject to ongoing review and will be confirmed in the final LBEMP. However, the level of biodiversity gain to be provided would remain as committed in the BNG assessment (**Appendix D**).

6.0 MONITORING

- 6.1.1 A landscape architect and/ or an ecologist will undertake post-intervention habitat monitoring annually in June or July for a period of ten years. This timeframe reflects the advised time period for the establishment of the committed grassland habitats and is also considered appropriate to provide sufficient time to confirm a net gain for biodiversity.
- 6.1.2 The monitoring approach will be provided with the final LBMEP and will involve a condition assessment walkover survey to complete the following:
- review of the establishment of seed mixtures, wetland plantings, and shrub plantings, and review of any requirements for remedial actions e.g. replacement of failed stock or re-seeding, or identification and rectification of damage;
 - review of grassland structure and composition, and associated implications for the agreed management regimes;
 - review of any native or non-native weed issues requiring treatment, or requirements for scrub control where the cover exceeds 5% of the total grassland area; and
 - review of establishment of vegetation within the pond and any requirements for management e.g. periodic vegetation clearance.
- 6.1.3 An ecologist will also make a ground level check of the barn owl, bird and bat boxes in January or February each year to identify any requirements for remedial action.
- 6.1.4 A brief monitoring report will be prepared in each year and provided to NLC as a record of compliance.

7.0 ROLES AND RESPONSIBILITIES

7.1 The Applicant and/ or the Appointed Main Contractor

7.1.1 The Applicant and/ or appointed main contractor will be responsible for:

- correct instruction of all parties contributing to delivery of the final approved LBMEP (including but not restricted to the Applicant's staff and their appointed ecologists, landscape architects, CoW, landscape contractors, construction contractors and management organisations);
- compliance with the final approved LBMEP, relevant legislation and any relevant planning commitments. This includes appropriate maintenance of new habitats for a minimum period of 25 years;
- keeping the appointed ecologist/ landscape architect/ arboriculturalist/ CoW informed of work activities that require support and supervision, so that it is clear when attendance on-site is required;
- enacting/ enforcing recommendations made by the ecologist/ landscape architect/ arboriculturalist/ CoW, or otherwise agreeing an appropriate alternative course of action, if it is subsequently determined that previous advice is not practicable or is out of date; and
- keeping a record of measures taken to deliver the requirements of the final LBMEP, to provide an auditable record of compliance.

7.2 The Appointed Ecologist

7.2.1 The appointed ecologist (including ecological CoW) will be responsible for:

- advising the Applicant on ecological matters and requirements for compliance with relevant legislation and protected species licences, providing support as instructed, and monitoring compliance with the final approved LBMEP;
- monitoring and assessing progress with delivery of biodiversity objectives and target condition of habitats on an annual basis for the first ten years following commencement of operation of the Proposed Development;
- reviewing the LBMEP at appropriate periodic intervals and revising management requirements as necessary at least once every five years thereafter for the duration of the LBMEP (minimum of 25 years); and
- providing the Applicant with survey reports and other written evidence required in accordance with the agreed scope of work and contractual obligations.

7.3 The Appointed Landscape Architect/ Arboriculturalist

7.3.1 The appointed landscape architect/ arboriculturalist (including landscape and arboricultural CoW) will be responsible for:

- monitoring and assessing the landscape related elements of the approved LBMEP for their effectiveness on an annual basis for the first five years following commencement of operation of the Proposed Development and then for the following five-year period and least once every five years subsequently for the duration of the LBMEP (minimum of 25 years);
- ensuring that the landscape related elements of the approved LBMEP are reviewed at the end of the five year initial monitoring and assessment stage and amended accordingly for the following five year period and subsequently for the duration of implementation of the LBMEP. The LBMEP shall be amended accordingly to suit any changing landscape conditions and ultimately inform the maintenance operations throughout the operational life of the Proposed Development; and
- ensuring that any reviews associated with landscape related elements of the approved LBMEP clearly identifies any changes to site conditions and circumstances, whether the aims and objectives of the approved LBMEP are being met, and where identified changes are needed to existing management practices and timeframes.

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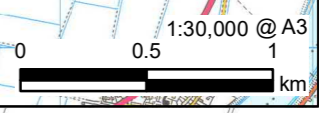
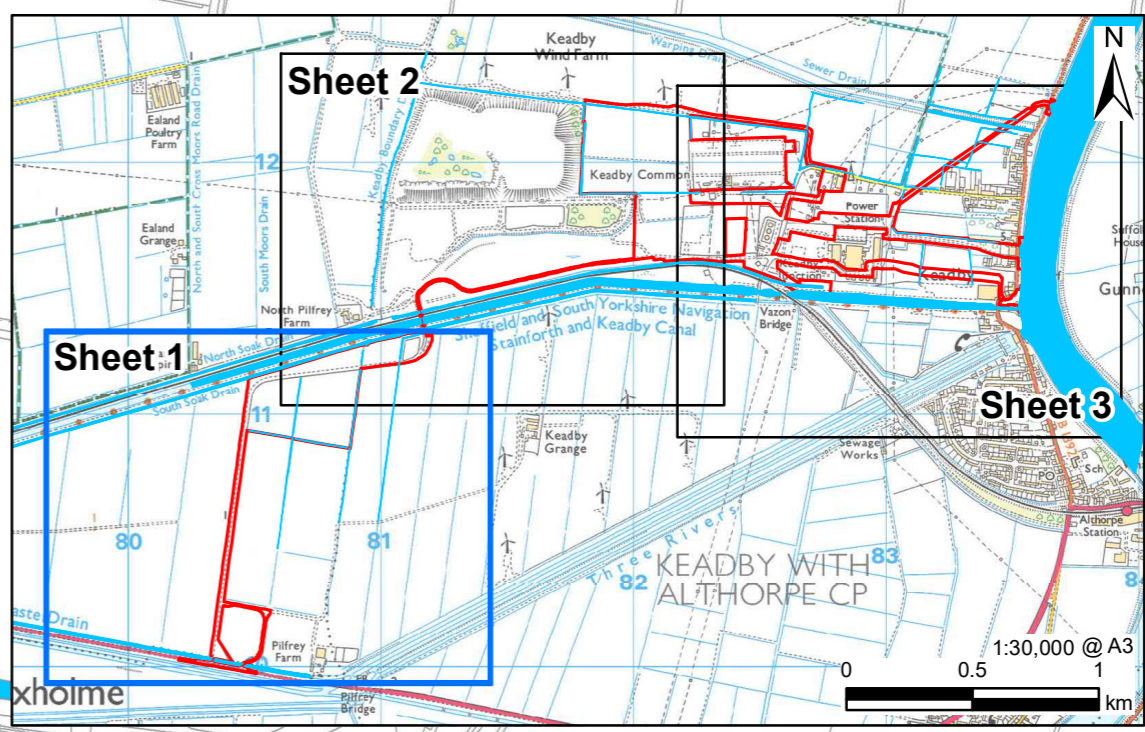
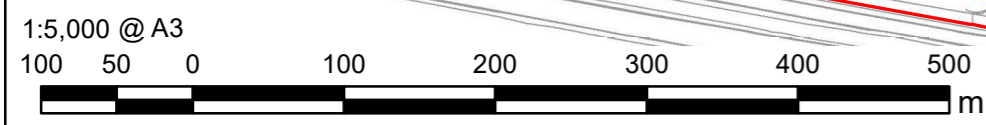
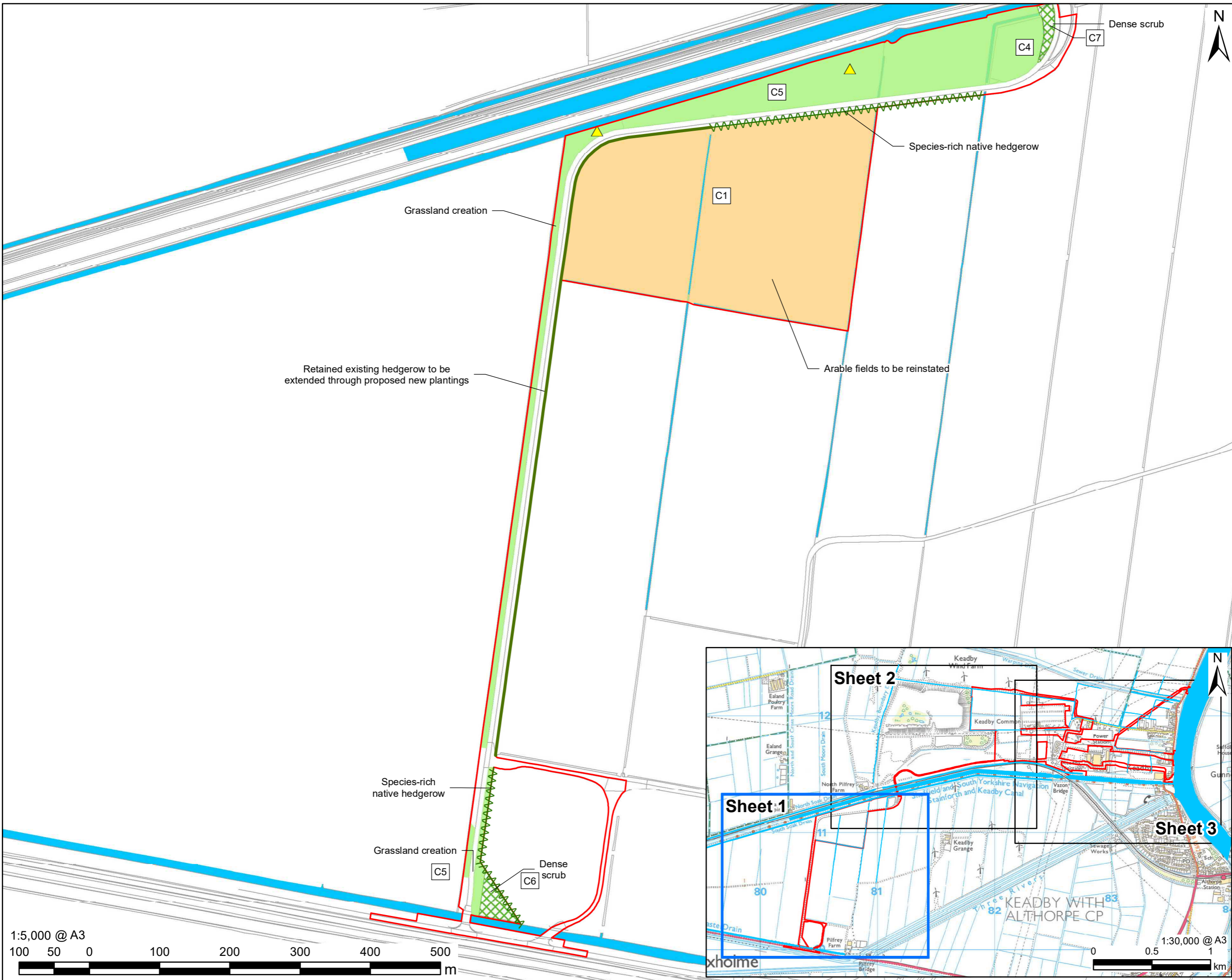
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FIGURES

Figure 1: Indicative Landscape and Biodiversity Enhancement Proposals



PROJECT
The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

APPLICANT
Keadby Generation Limited

CONSULTANT
AECOM Limited
2 City Walk
Leeds
LS11 9AR
T: 0113 391 6800
www.aecom.com

LEGEND

	The Order Limits
	Running Water
	Grassland Creation
	Proposed Dense Scrub
	Reinstated Arable Fields
	Proposed Species-Rich Native Hedgerow
	Retained Existing Hedgerow
	Indicative Locations for Barn Owl Towers

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The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order Regulation 5(2)(o) - Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009

ISSUE PURPOSE
DCO APPLICATION

PROJECT NUMBER
60625943

SHEET TITLE
Landscaping and Biodiversity Management and Enhancement Plan
Sheet 1 of 3

SHEET NUMBER
Application Document Ref. 5.10

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LEGEND

	The Order Limits
	Keadby Ash Tip
	Running Water
	Attenuation Pond
	Enhancement of Drains
	Grassland Creation
	Grassland Enhancement Over Electric Cable
	Proposed Dense Scrub
	Reinstated Arable Fields
	Proposed Species-Rich Native Hedgerow
	Retained Existing Hedgerow
	Indicative Locations for Barn Owl Towers

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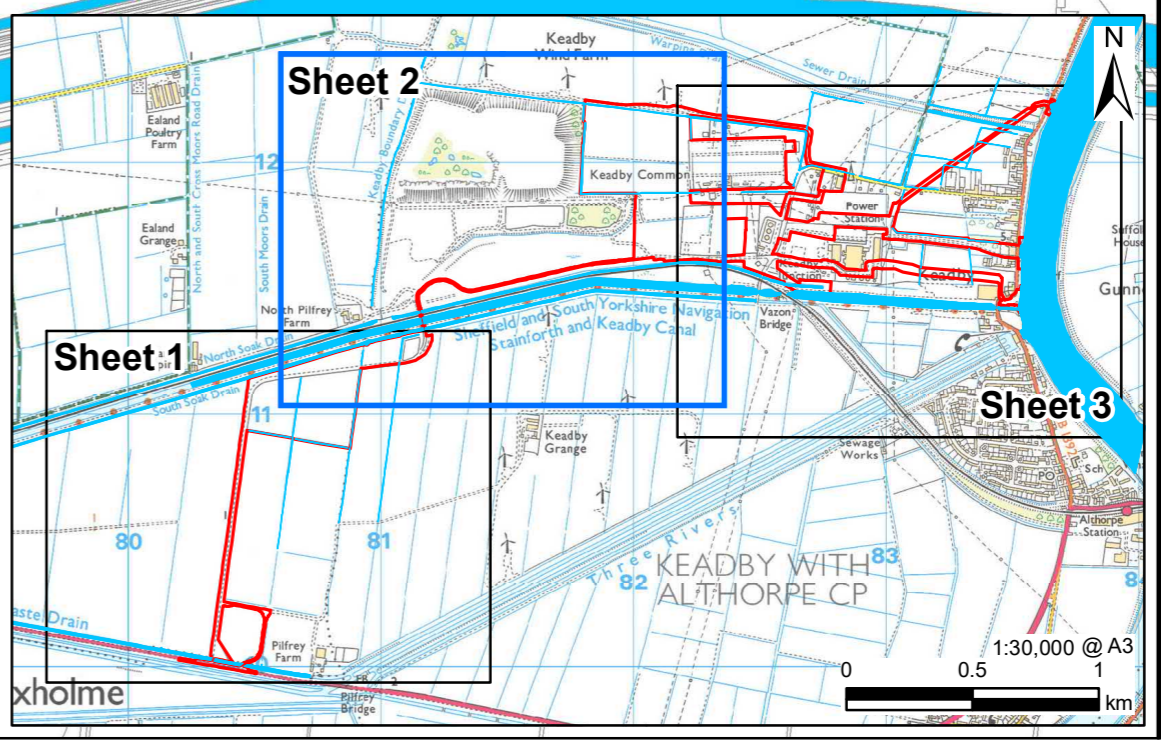
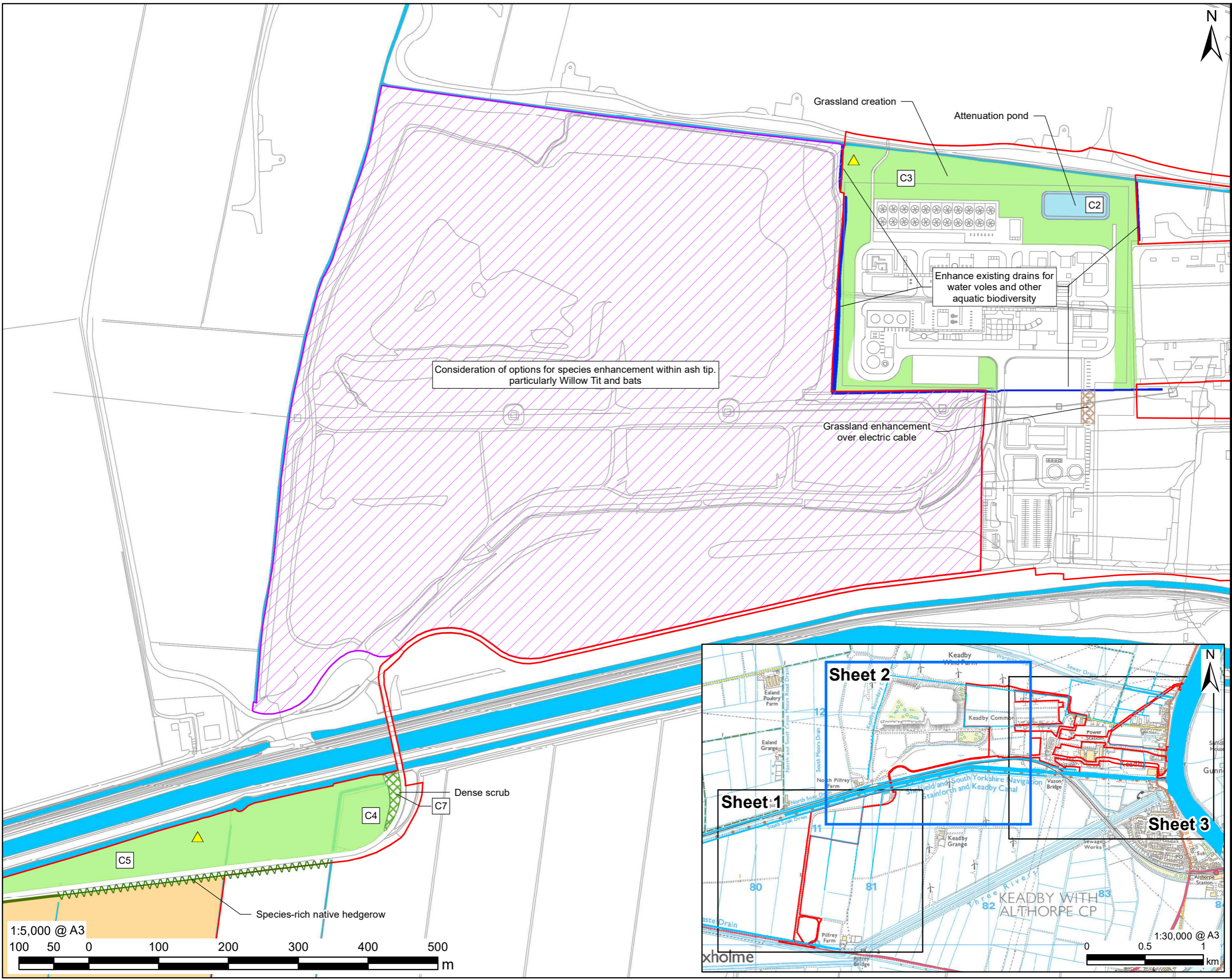
The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order Regulation 5(2)(o) - Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009

ISSUE PURPOSE
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PROJECT NUMBER
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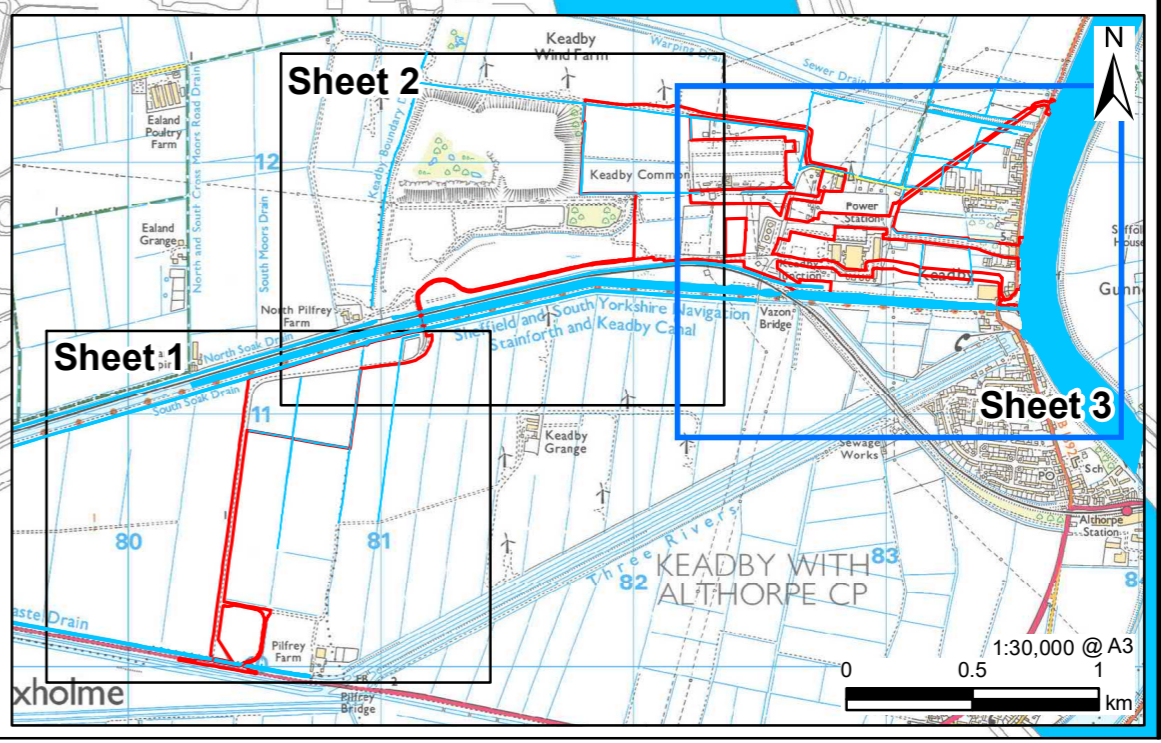
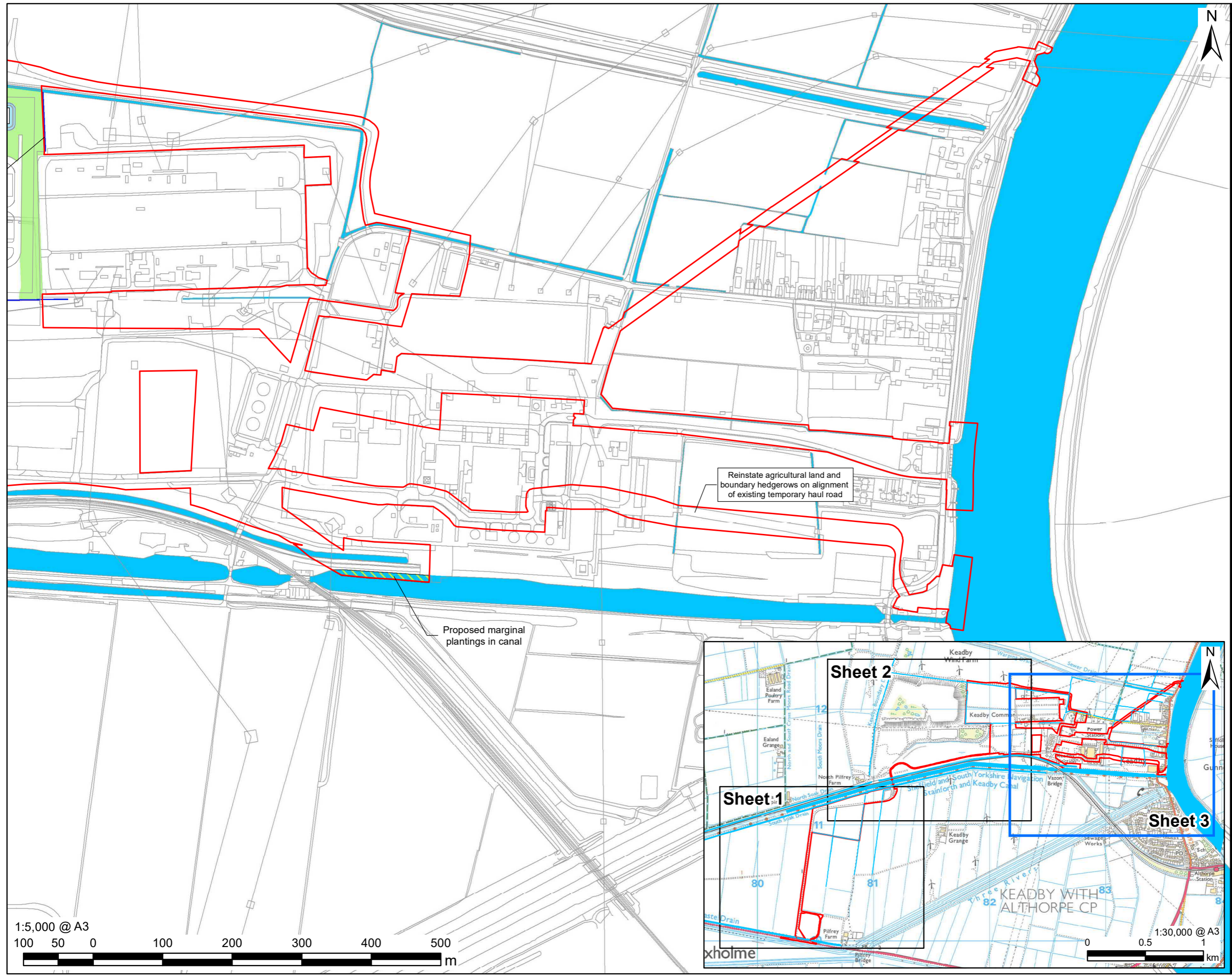
SHEET TITLE
Landscaping and Biodiversity Management and Enhancement Plan
Sheet 2 of 3

SHEET NUMBER
Application Document Ref. 5.10



Revision: 03 Drawn: JW Checked: CA Approved: HN Date: 06/05/2022
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LEGEND

	The Order Limits
	Running Water
	Attenuation Pond
	Enhancement of Drains
	Grassland Creation
	Marginal Plantings in Canal

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ISSUE PURPOSE
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PROJECT NUMBER
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Landscaping and Biodiversity Management and Enhancement Plan
Sheet 3 of 3

SHEET NUMBER
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APPENDIX A SEED MIXTURES

A.1.1 EM4 Meadow Mixture for Clay Soils

% Contribution	Common name	Latin name
0.6	Yarrow	<i>Achillea millefolium</i>
4.5	Common knapweed	<i>Centaurea nigra</i>
0.5	Meadowsweet	<i>Filipendula ulmaria</i>
0.2	Lady's bedstraw	<i>Galium verum</i>
0.4	Meadow crane's-bill	<i>Geranium pratense</i>
0.2	Rough hawkbit	<i>Leontodon hispidus</i>
4	Oxeye daisy	<i>Leucanthemum vulgare</i>
0.3	Birdsfoot trefoil	<i>Lotus corniculatus</i>
0.4	Cowslip	<i>Primula veris</i>
4.4	Selfheal	<i>Prunella vulgaris</i>
0.5	Meadow buttercup	<i>Ranunculus acris</i>
0.8	Yellow rattle	<i>Rhinanthus minor</i>
1.2	Common sorrel	<i>Rumex acetosa</i>
0.5	Great burnet	<i>Sanguisorba officinalis</i>
0.4	Pepper saxifrage	<i>Silaum silaus</i>
0.1	Devil's-bit scabious	<i>Succisa pratensis</i>
1	Tufted vetch	<i>Vicia cracca</i>
10	Common bent	<i>Agrostis capillaris</i>
1	Meadow foxtail)	<i>Alopecurus pratensis</i>
3	Sweet vernal-grass	<i>Anthoxanthum odoratum</i>
1	Quaking grass	<i>Briza media</i>

% Contribution	Common name	Latin name
26	Crested dogtail	<i>Cynosurus cristatus</i>
24	Slender-creeping red-fescue	<i>Festuca rubra</i>
1	Meadow barley	<i>Hordeum secalinum</i>
4	Smaller cat's-tail	<i>Phleum bertolonii</i>
10	Smooth-stalked meadow-grass	<i>Poa pratensis</i>

APPENDIX B BARN OWL TOWER DESIGN PARAMETERS

Pole-box Design

An outdoor Barn Owl nestbox suitable for erection on a large pole



LEAFLET No 50

Reg. Charity No 299 835

This leaflet describes how to make a Barn Owl nestbox suitable for erection on a large telegraph pole. The information includes plans, dimensions, materials, safety advice and erection tips.

Please note:

Nestboxes in buildings are generally the best option, followed by nestboxes in trees. Pole boxes are usually only erected where these options are not available. Nestboxes should never be erected on operational telegraph/electricity poles and erecting your own telegraph pole is expensive. Building and erecting a pole nestbox is a lot of work so before deciding to proceed make sure there is no alternative. See *Nestboxes for use in Barns & Other Buildings* (leaflet no. 3) and *Nestboxes for use on Trees* (leaflet no. 2).

Suitability of the area

The Barn Owl is not a woodland bird. In the UK, Barn Owls hunt mainly by flying over areas of rough grassland, ditch sides, young tree plantations etc. that support a high population of small mammals. In areas with an abundance of food but a shortage of suitable sites, nestboxes can be of great benefit. They should always be placed in areas with some good Barn Owl habitat or they are unlikely to be used. See *Habitat Management* (leaflet no. 1)

Selecting a suitable pole

A pole box is big and heavy and cannot be adequately supported by a thin or flexible pole. A good pole will not only support the box for many years but will also be strong enough to take the weight of someone climbing a ladder leaned against it during inspection or clearing out. Most proper telegraph or electricity poles are suitable and just need to be cut to the right length.

You should be aiming for an erection height over 4 metres above ground level using a substantial pole of not less than 150mm diameter and 6 metres long (1.5m underground and 4.5m in height). In areas where climbing nest-predators are a problem (such as Beech Martens in mainland Europe) position the pole away from buildings or trees and wrap a 1.5m section of the pole with thin aluminium or other very slippery material.

Pole-box construction

The basic box should be built using exterior grade rot-resistant or Tanalith E treated sheet material. The Barn Owl Trust uses 12mm tanalised ($\frac{1}{2}$ ") softwood ply, 25 x 50mm (2" x 1") tanalised batten and 30mm ($1\frac{1}{4}$ ") rust resistant screws. There's also a small amount of 50 x 50mm timber and a piece of 18mm ply used in this design. Please avoid using hardwood ply, unless it is

stamped "FSC Approved".

You may use any type of wood preservative on the box where tanalised (CCA-treated) ply is not available. The preservative should be applied to all component parts before the box is assembled so that all the edges are properly treated. Make sure the treated wood is dry before you assemble the box. During construction a waterproof sealant (such as EVER BUILD – WEATHER MATE) should be applied to all the wood joints to increase weather protection. If you need proof that this is necessary, try leaving your box under a sprinkler for a few hours and then look inside it.



Although tanalised timber is very rot-proof it's not very waterproof so the roof sheets should also be treated with Creosote or some other water-resistant preservative. The apex should be covered with a strip of aluminium or copper. The front, back and sides **MUST** overhang the floor of the box and as an extra precaution a large drainage hole (20mm - ¾" - diameter) should be drilled in each corner of the floor of the box.

All the dimensions are given as a guide and variations of + or - 10% are quite acceptable. The box must have a large access panel to enable nest debris to be cleared out periodically.

You can see a cutting plan and watch a slideshow of a pole-box being constructed on our website www.barnowltrust.org.uk

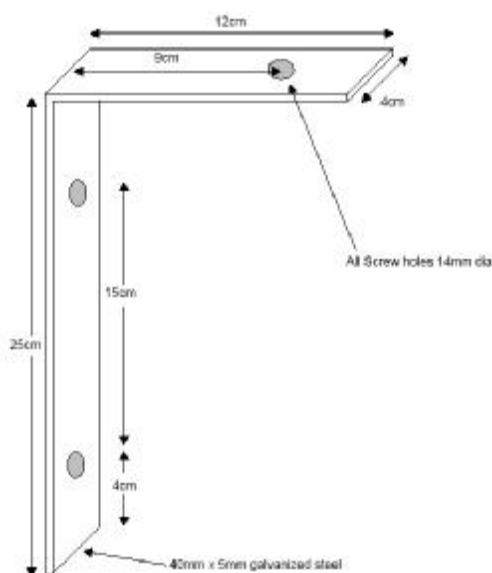
Siting the pole-box

Time spent in reconnaissance is seldom wasted. Please avoid siting your box within 1km (½ mile) of a dual-carriageway, motorway or similar modern road because of the high risk of road mortality. Nestboxes placed in a patch or strip of good (rough grassland) habitat are likely to be discovered more quickly as are boxes placed at existing roost sites. However, neither of these factors is essential.

The box should face open ground so that the main entrance hole is obvious to a passing owl. Don't hide it between big trees or tall buildings – if an entrance can't be seen easily the box is less likely to be discovered. Try to avoid facing the box towards prevailing wind and rain. Generally this means avoiding the west or south-west. The ridge of the roof should lie north-south or northwest-southeast.

The box will need to be cleaned out in future so think about where the ladder could stand and position the box so that this can be done safely.

POLE-BOX BRACKET DIMENSIONS



Erecting the box

By far the simplest and safest option is to attach the box to

the pole before the pole is erected. If the pole has already been erected you may consider the use of tower scaffolding or a "cherry-picker" hydraulic platform. It is possible to erect a pole-box (on a pole that's already up) without using any machinery. However, a pole-box is heavy and awkward to lift by hand and the use of ladders is potentially dangerous. The Barn Owl Trust has placed pole-boxes onto previously-erected poles on numerous occasions with a team of three people using three ladders but a detailed description of the method is beyond the scope of this leaflet. Heavy duty galvanised steel brackets, coach bolts, and coach screws are used to secure the box to the pole.

The most important thing when erecting the box is your own safety (for which you are responsible), the safety of your helpers, and the safety of anyone going up to the box in future years. Make sure you carry out a detailed assessment of the risks associated with whatever method you choose and do not attempt to erect a pole-box when working alone!

Each half of the exercise platform should be slid onto the box after erection and retained by screwing through the two outer battens. To facilitate this the box has ladder rests on both sides as well as below the inspection hatch.

Important advantages of this pole-box design

The nestbox described in this leaflet is very deep which makes it almost impossible for the young to emerge prematurely. This reduces the chances of nestlings falling from the box and dying as a result of neglect or predation. By the time a young Barn Owl is big and strong enough to get out of the box it will soon be fully fledged. The design also provides emerging young with a very generous exercise platform enabling them to do lots of wing-flapping before their first flight. They can even get onto the roof of the box and safely back inside before they are able to fly.

The combination of box depth and safe exercise area means that when a young owl leaves the box for the first time it stands a very good chance of being able to fly up and get back inside. This period of returning to the box is important for their survival. Boxes with low entrance holes allow young to leave the box before they are big or strong enough to fly back up again. Young on the ground are generally ignored by the adults and either starve or are predated. Whereas young emerging from a tree-mounted nestbox stand some chance of being able to climb back up, a pole box does not allow the same possibility.

This design has other important features and detailed criteria for the evaluation of Barn Owl nestbox designs may be found at:

www.barnowltrust.org.uk/infopage.html?id=231

Clearing out the box

As the box fills up with nest debris its effective depth is reduced and so it gradually becomes less safe for emerging young. After four or five broods of young have been produced (normally after about four years) the nest debris should be removed. Boxes used by Jackdaws will fill rapidly with sticks and should be

cleared out every year. When clearing out nest debris it is advisable to wear gloves and a dust mask. It's usually best to clear out nestboxes in November, December or January (but please try to avoid flushing birds out during severe weather conditions). Under the Wildlife and Countryside Act 1981, it is an offence to disturb breeding Barn Owls.

Safety tips

Before erecting your nestbox take time to consider the hazards you might face and what steps you could take to minimise the risks. Hazards might include: an injury at a remote location, falling from a ladder, injury from heavy lifting, dropping a nestbox onto another person, or poor positioning of a box resulting in additional hazards for anyone monitoring the box at a later date. The following are examples of precautions you should take to reduce the risks.

- 1 Don't work alone. If erecting a nestbox at an isolated site, let someone know where you are going and when you expect to be back before you set off. Carry a mobile phone if you have one.
- 2 Time spent in reconnaissance and preparation is seldom wasted. Never lift a box up into position until all preparatory work is complete. Double-check your measurements to confirm that the box will fit.
- 3 Ensure that any ladder you use is secure before climbing it. If possible tie it off at the top and bottom.
- 4 Avoid over-reaching - never attempt to carry out any task up a ladder if you cannot reach comfortably.
- 5 When planning how to position, support and fix a nestbox, try to create a situation where the box can rest in position without being held. This will allow you to have both hands free to fix it safely.

- 6 If carrying a nestbox up a ladder, ensure that it is kept low relative to your body (ideally not above waist height). This will keep your centre of gravity down. Try to keep the box in front of you or to the side - never hold a nestbox behind or above you.
- 7 You are responsible for your own safety - assess all the risks and be careful.

Please let us know when your box is occupied.

Good Luck!

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Friends receive our bi-annual magazine Feedback, our Annual Report and an enamel pin badge.

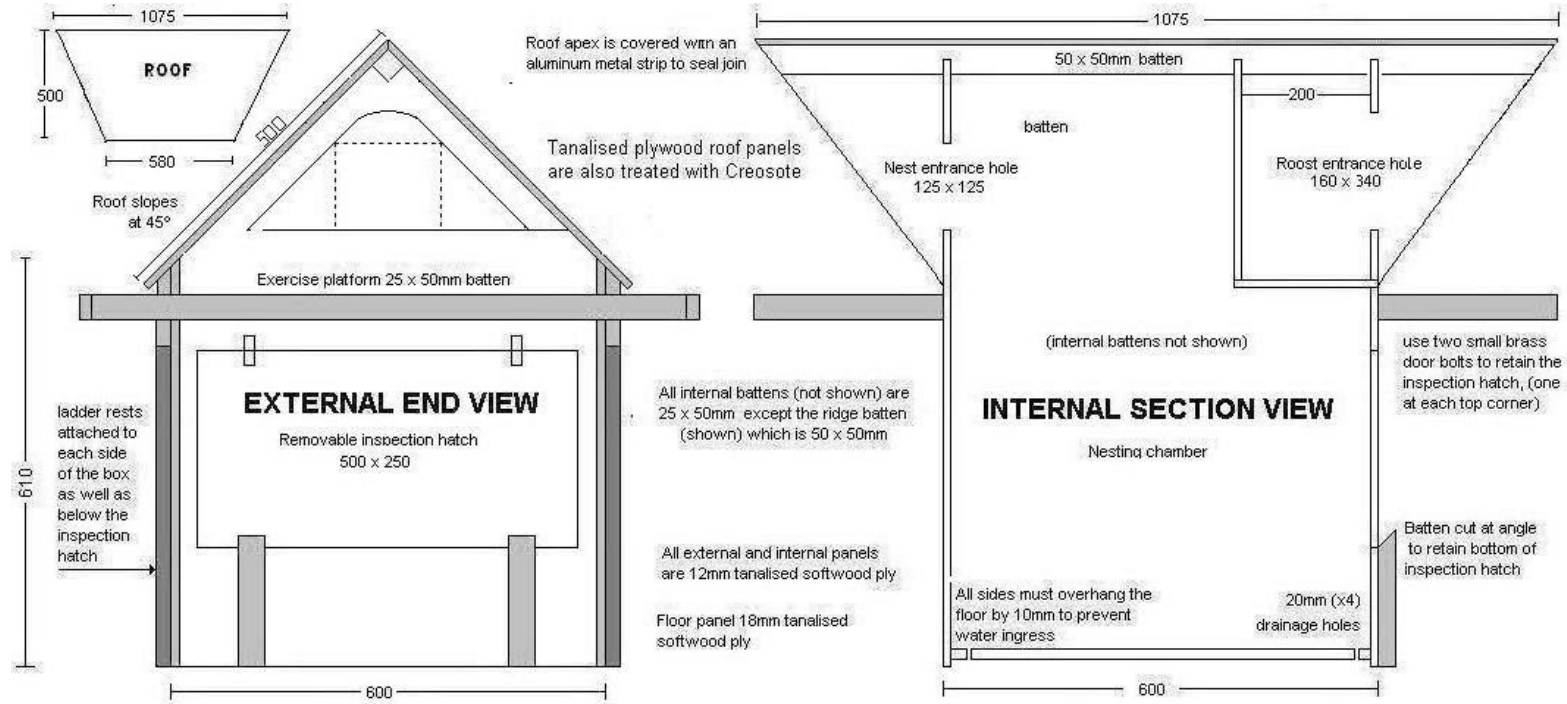
The Trust provides a wide range of free leaflets on Barn Owl related matters. For details of these and further information about the Trust and its work, please write including a large SAE to:

Barn Owl Trust
Waterleat
Ashburton
Devon
TQ13 7HU

Tel: 01364 653026
Email: info@barnowltrust.org.uk
Web: www.barnowltrust.org.uk



Leaflet No. 50—Pole-box design—an outdoor Barn Owl nestbox suitable for erection on a large pole



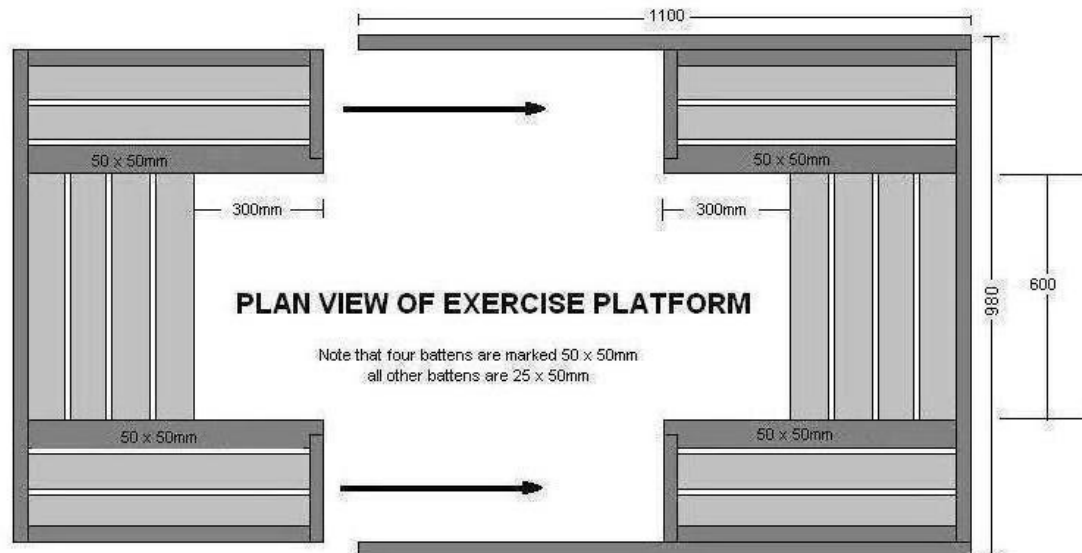
BARN OWL TRUST POLE BOX DESIGN.

Photographs of this box under construction may be viewed at www.barnowltrust.org.uk

The platform is made in two parts. After the box has been erected the platform halves simply slide onto the box and the outer extended battens (already attached to one half of the platform) are screwed to the other half. To facilitate this, the box has ladder rests on both sides. Please note that the light grey shaded battens in this diagram are flat and level with the bottom of all the other timbers. This effectively gives the tray an edge that is easy for young birds to grip.

Drawing NOT to scale

all dimensions are millimetres



APPENDIX C MAINTENANCE REGIMES

C.1.1 The landscape and biodiversity management and enhancement area will be managed and maintained for 10 years, with a review after 5 years to potentially integrate the management and maintenance.

Landscape Element Type	Maintenance Year 1												Maintenance Years 2, 3 and 4												Maintenance Year 5 and ongoing (to be reviewed and amended as required)											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Low Maintenance Grassland																																				
Remove litter, rubbish and debris	█				█				█				█				█				█				█				█				█			
Spot-treat undesirable species				█		█			█							█		█			█							█		█			█			
Establishment cuts (may occur pre-practical completion)					█	█	█																													
Subsequent cuts																█		█		█	█							█		█		█	█			
Control emerging scrub								█												█												█				
Species Rich Grassland																																				
Remove litter, rubbish and debris	█				█				█				█				█				█				█				█				█			
Spot-treat undesirable species				█		█			█							█		█			█							█		█			█			
Establishment cuts (may occur pre-practical completion)					█	█	█																													
Subsequent cuts																█				█	█							█				█	█			
Removal of arisings					█	█	█									█				█	█							█				█	█			
Control emerging scrub								█												█												█				

APPENDIX D BIODIVERSITY NET GAIN ASSESSMENT

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1.0 INTRODUCTION

1.1 Overview

1.1.1 Biodiversity Net Gain (BNG) is an approach to development that intends to leave biodiversity in a better state than before. It encourages developers to provide an increase (in extent and/or quality) in appropriate natural habitat over and above that required to compensate for the habitat losses that would arise from the development concerned. In so doing, the BNG approach aims to assess the current loss of biodiversity through development and contribute to the restoration of ecological networks.

1.1.2 This BNG assessment has been prepared to measure and quantify, in a repeatable manner using an approved method, the impact of the Proposed Development on biodiversity and nature conservation. This assessment therefore complements and directly supports, and therefore should be read in conjunction with, the Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) (of which this appendix is part of). Further descriptive detail on the background to the Proposed Development is provided in:

- **Chapter 1:** Introduction (ES Volume I, Application Document Ref. 6.2.1, **APP-044**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7- Rev 03**);
- **Chapter 3:** The Site and Surrounding Area (ES Volume I, Application Document Ref. 6.2.3, **APP-046**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 03**);
- **Chapter 4:** The Proposed Development (ES Volume I, Application Document Ref. 6.2.4, **APP-047**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 03**);
- **Chapter 5:** Construction Programme and Management (ES Volume I, Application Document Ref. 6.2.5, **APP-048**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 03**); and
- **Chapter 6:** Consideration of Alternatives (ES Volume I, Application Document Ref. 6.2.6, **APP-049**) and ES Addendum Volume I (**Application Document Ref 6.2.1 – 6.2.7 Rev 03**).

1.1.3 The final LBMEP will be delivered as a Requirement of the Development Consent Order (DCO) and is to be agreed with North Lincolnshire Council (NLC) once the detailed design has been completed. Proposals in relation to the Stainforth and Keadby Canal shall be discussed and agreed with the Canal and River Trust. At this time, an update of the BNG assessment (i.e. this appendix) will also be presented to demonstrate that the approach and quantum of BNG, as set out in this report and the related LBMEP, remains consistent with that agreed at Examination of the DCO Application.

1.2 Relevant Legislation and Planning Policy

- 1.2.1 The Environment Act 2021 mandates the need for new development to deliver 10% BNG and to maintain this for a period of at least 30 years. However, secondary legislation needs to be enacted before this requirement is legally enforceable for Nationally Significant Infrastructure Projects (NSIP). Therefore, the government intends that the BNG requirement of the Act should apply across all terrestrial infrastructure projects, or terrestrial components of projects, accepted for examination by the Planning Inspectorate through the NSIP regime by November 2025. At this time, a minimum quantum of BNG will also apply and this has been set at 10%. Projects accepted for examination before the specified commencement date would not be required to deliver mandatory BNG, although they might deliver it in response to policy or voluntary commitments.
- 1.2.2 In relation to requirements under the Act, a standardised assessment method and calculation tool has also been mandated. The good practice standard at the time of preparation and consultation on BNG and the LBMEP during examination was Biodiversity Metric 3.0 (Natural England, 2021).
- 1.2.3 The current approved version of Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change, 2011) does not explicitly mandate BNG assessment, and instead only includes a requirement that applicants should show how the NSIP *“has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.”*
- 1.2.4 The emerging revision of Overarching NPS for Energy (EN-1) (Department for Business, Energy and Industrial Strategy, 2021) is likely to include specific requirements in relation to BNG, although it should be noted that the current draft text was published before the Environment Act 2021 was enacted. Paragraph 4.5.2 states *“although achieving biodiversity net gain is not an obligation for projects under the Planning Act 2008, energy NSIP proposals should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity where possible. Applicants are encouraged to use the most current version of the Defra biodiversity metric¹ to calculate their biodiversity baseline and inform their biodiversity net gain outcomes and to present this data as part of their application.”*
- 1.2.5 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021) addresses BNG in more general terms, encouraging net gains for biodiversity to be sought through planning policies and decisions. For example paragraph 180(d) states *“opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for*

¹ It should be noted that the wording here is erroneous given that at the time of publication this metric had been replaced by Biodiversity Metric 3.0 (Natural England, 2021)

biodiversity.” Within the supplementary Planning Practice Guidance on the natural environment, the government has further clarified that “*using a metric is a pragmatic way to calculate the impact of a development and the net gain that can be achieved*” in support of compliance with the NPPF.

- 1.2.6 North Lincolnshire Local Development Framework (LDF) Core Strategy (adopted 2011) (NLC, 2011) also addresses BNG in general terms. Policy CC17 states “*ensuring development seeks to produce a net gain in biodiversity by designing in wildlife, and ensuring any unavoidable impacts are appropriately mitigated for*” and “*... wildlife enhancements that contribute to the habitat restoration targets set out in the North Lincolnshire’s Nature Map and in national, regional and local biodiversity action plans.*” However, there is no applicable local planning policy that requires either delivery of a specific quantum of BNG, or the method through which BNG should be quantified and demonstrated.
- 1.2.7 The emerging North Lincolnshire New Local Plan (Preferred Options (Regulation 18) consultation draft, 2020) (NLC, 2020) is expected to strengthen the policy regime in relation to BNG. Draft policy DQE3p states that “*all schemes shall, as appropriate to their nature and scale, deliver a net gain in biodiversity.*”
- 1.2.8 Draft policy DQE3p goes further by setting parameters for how this should be achieved in practice, specifically “*priority habitats, where practicable, should be retained, enhanced or created within the development site or suitable alternative habitats should be provided elsewhere*” and “*development proposals should create new habitats and links between habitats in line with Biodiversity Opportunity Mapping evidence to maintain a network of wildlife sites and corridors to minimise habitat fragmentation and provide opportunities for species to respond and adapt to climate change. Biodiversity offsetting will be used where net gain cannot be achieved within the site boundary.*”
- 1.2.9 Other strategic guidance relevant to interpretation of the above requirements and development of the BNG strategy comprises:
- National Pollinator Strategy (Defra, 2014);
 - Lincolnshire Local Biodiversity Action Plan (LBAP) (Lincolnshire Biodiversity Partnership, 2011); and
 - National Character Area (NCA) Profile 39 (NE339): Humberhead Levels (Natural England, 2012).

1.3 Relevant BNG Assessment Guidance

- 1.3.1 This report has been prepared with reference to the following good practice guidance:

- The suite of BNG technical guidance and standards published to accompany Biodiversity Metric 3.0 (Natural England, 2021 (as last updated on 13 August 2021));
- BNG Report and Audit Templates published by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2021);
- BNG: Good practice principles for development published by CIEEM, Construction Industry Research and Information Association (CIRIA) & Institute of Environmental Management and Assessment (IEMA) (2016); and
- British Standard BS 8683: Process for designing and implementing biodiversity net gain – Specification (British Standards Institution, 2021).

2.0 METHODS

2.1 Overview of the Approach

- 2.1.1 BNG assessment involves making a comparison between the biodiversity value of habitats present within a defined site boundary (in this case the Order Limits as shown on **Figure 1**) prior to implementation of the Proposed Development (the ‘baseline’) and the predicted biodiversity value of habitats following completion of the Proposed Development and associated commitments under the LBMEP (‘post-development’). The comparison is made in terms of ‘biodiversity units’, with a ‘biodiversity metric’ providing the mechanism to allow biodiversity values to be calculated and compared.
- 2.1.2 Biodiversity Metric 3.0 (Natural England, 2021), the current iteration of the approved metric at the time of preparation of this BNG assessment, calculates the overall loss or gain of biodiversity by assessing the distinctiveness (i.e. type of habitat and its relative value), condition, extent, and strategic significance of the habitats present pre- and post-development. Distinctiveness is assigned automatically by the metric based on habitat type, but the remaining three parameters need to be entered by the assessor. The approach for assessing condition and assigning strategic significance is described below in Sections 2.3 to 2.5.
- 2.1.3 In relation to the post-development baseline, the metric also includes weightings based on the difficulty of the proposed intervention, how long after the original habitat loss the intervention will take place (i.e. the delay), and the time it would take for the proposed interventions to achieve target condition. The first and last of these are again assigned automatically by the metric, but the delay needs to be entered manually based on a realistic precautionary assessment of likely timelines. An indicative construction programme is provided in ES **Chapter 5: Construction Programme and Management** (Application Document Ref. 6.2.5, **APP-048**) and indicates that construction (including site clearance) will take 3 to 4 years and therefore that soft landscaping works are likely to be undertaken 4 years after the original habitat loss to the Proposed Development (a 4-year delay) at a comparable time as commissioning and testing prior to first commercial operation.
- 2.1.4 To achieve BNG, the biodiversity unit score must have a post-intervention score higher than the baseline score. When calculating the post-intervention biodiversity units, the metric includes a series of standard ‘risk multipliers’ to account for the inherent risk of creating and restoring habitats, and the time taken to establish habitats. The risk multipliers have the effect of reducing the value of the proposed habitats, which means larger areas, and habitats of higher distinctiveness and/ or condition are required to achieve net gain.
- 2.1.5 The metric assesses and generates separate outputs for area-based habitats (measured in habitat units) and linear habitats, including hedgerows (measured in hedgerow units) and watercourses (measured in river units).

- 2.1.6 An Excel calculation tool (workbook) has been provided as part of the package of documents comprising Biodiversity Metric 3.0 and this has been utilised to make the BNG assessment.

2.2 Baseline Data Gathering

- 2.2.1 A Phase 1 Habitat survey was undertaken in accordance with the standard survey method (Joint Nature Conservation Committee, 2016) as described in **Appendix 11C**: Preliminary Ecological Appraisal Report (ES Volume II, Application Document Ref. 6.3.14, **APP-078**) to record the area-based and linear habitats present and to collect data to permit the baseline condition of these habitats to be assessed. However, the approach for rivers differed from that for other habitats (including ditches), as explained in Section 2.3.
- 2.2.2 Phase 1 Habitat survey is a standard method of environmental audit. It involves categorising different habitat types and habitat features within a survey area.
- 2.2.3 Each discrete habitat parcel was appraised to determine the baseline habitat condition (which is a proxy for habitat value) for entry into Biodiversity Metric 3.0, or if this was not possible (e.g. in the case of unaffected ditches located on third party land) a precautionary (realistic best case) condition was applied. The Site Condition Assessment was made within reference to the criteria published by Natural England with Biodiversity Metric 3.0 (Natural England, 2021). Using these criteria each habitat was typically assigned either Poor, Moderate or Good condition, although it is also possible for these scores to be upgraded or downgraded (depending on the starting point) using professional judgement to the categories Fairly Poor or Fairly Good. Where this has been done, the reasons for this are provided in this report or the Excel workbook (**Annex B**).
- 2.2.4 The baseline site condition scores are the basis for determining whether meaningful habitat enhancement can be achieved, the parameters for that enhancement (i.e. what needs to be achieved to boost the habitat condition to a higher level), and what condition score can reasonably be achieved post-intervention.
- 2.2.5 Biodiversity Metric 3.0 uses a modified version of the UK Habitat Classification (UKHab), so the Phase 1 habitat survey data collected by AECOM was translated after the survey into its UKHab equivalent with reference to the conversion guidance contained within the metric. The relevant UKHab habitats are shown on the Habitat Baseline Plan (**Figure 1**).

2.3 River and Ditch Habitats

- 2.3.1 Assessment requirements in relation to rivers (including streams and canals but not wet ditches) diverge from the approach for other habitats (as summarised above in Section 2.2).
- 2.3.2 Assessment of condition is based on the extent and diversity of observed physical features in the channel and the adjacent riparian zone (including the

physical structure of vegetation) as well as the extent and types of any human modifications. The physical state of a river reach is a useful proxy for determining overall riverine ecological quality but needs to be attuned to the type of river under consideration.

- 2.3.3 In line with current guidance (Natural England, 2021), habitat categorisation, associated distinctiveness and condition scores requires a desk study. The purpose is to identify the river habitats present within the Order Limits using the 'Discovering Priority Habitat in England' river data map (Freshwater Biological Association, 2022) and to inform the categorisation of the river habitats present and the distinctiveness and condition of these river habitats.
- 2.3.4 If desk study data are not available, then a Modular River Physical (MoRPh) survey may be needed to assess the condition of rivers. However, condition can also be assigned retrospectively using suitable data collected during other aquatic ecology and habitat surveys and employing a precautionary approach where certain parameters are not known (as would be the case during a MoRPh survey where access is constrained or unsafe).
- 2.3.5 The exception to the foregoing approach is ditches, as the method for condition assessment is the same as for area-based habitats. Ditches located outside areas of agreed land access (i.e. within areas unaffected by the Proposed Development, such as ditches crossing over the alignment of the Water Discharge Corridor) were assigned a precautionary (likely best case) condition of 'Moderate'. There was no need to assess the condition of culverts, where these occur, as the heavily modified nature of these means that they assigned poor condition by default.
- 2.3.6 Impacts on river habitats are assessed in terms of 'encroachment' by development. Encroachment is defined as "*a reduction in the quantity/ quality and 'use' of available habitat that forms a specific ecological function for riparian or aquatic specialist species. Whereby, 'use' is defined as the ability of a species to: commute, forage, rest/ dwell, or access as part of its life cycle between aquatic and terrestrial phases*" (Natural England, 2021). Therefore, works within the riparian zone of a river within a pre-existing area of hardstanding would not be riparian encroachment, as there would be no impact on quantity or quality of habitat or its suitability for use by species.
- 2.3.7 The relevant rivers and ditches are shown on the River Baseline Plan (**Figure 2**).

2.4 Post Development Data

- 2.4.1 The Indicative Landscape and Biodiversity Plan (**Application Document Ref. 4.15**, also shown as Figure 1 of the LBMEP) has been used to determine the extent and type of habitats to be retained and created post-development.
- 2.4.2 The habitats shown on the Indicative Landscape and Biodiversity Plan have been digitised into the Geographic Information System (GIS) so that the area

and length measurements could be produced for habitat losses, the affected habitats that would be reinstated, and other unaffected areas to be enhanced.

2.4.3 The post-development habitats proposed have been assigned to the intended UKHab categories. Target condition scores for the proposed habitats are considered to be realistic and therefore suitably precautionary. No new habitats are proposed that require novel approaches, and instead all can be created using well-established techniques and based on a good understanding of typical management requirements and outcomes.

2.5 Strategic Significance

2.5.1 All baseline and post-development habitat parcels must be assigned a strategic significance score, and this relates to whether the site as a whole or individual component habitats have been identified as significant for nature. Recognising strategic significance therefore gives extra value to habitats that are in optimal locations, or are of a type, that meet local objectives for biodiversity.

2.5.2 Application of strategic significance requires that a score be assigned to each habitat parcel. The options for scoring each habitat parcel are:

- High - within an area formally identified in a local strategy, plan or policy.
- Medium - location ecologically desirable, but not identified in a local strategy, plan or policy.
- Low - not identified in a local strategy, plan or policy OR no strategy or plan is in place in the area.

2.5.3 The ‘within an area formally identified in a local strategy’ scoring option should only be selected for those specific habitats identified as being geographically important within relevant local strategies. For example, if the survey site contains a mixture of habitats and is within an area identified as strategically important for lowland calcareous grassland it is only the lowland calcareous grassland that would be recorded as ‘within an area formally identified in a local strategy.’ However, when a local strategy identifies an area as ecologically significant generically, such as a Local Site or strategic ecological corridor, all habitats occurring within that area would be identified as ‘within an area formally identified in a local strategy.’

2.5.4 To determine the strategic significance of sites and habitats, the local plans, strategy and policy documents detailed in Table 1 were reviewed.

Table 1: Plans and policy informing assessment of strategic significance

Plan	Relevant habitats	Applicable policy or guidance
Lincolnshire BAP, 3rd Edition	Open Mosaic Habitat	Not applicable

Plan	Relevant habitats	Applicable policy or guidance
	Rivers, canals and drains (but not minor field ditches) Acid grassland Gardens and allotments Other national priority habitats	
North Lincolnshire LDF Core Strategy June 2011	Habitats within nature conservation designations Hedgerows Other national priority habitats	CS16
North Lincolnshire Local Plan Publication Plan October 2021	Habitats within nature conservation designations Habitats meeting LWS criteria (encompassing Keadby Ash Tip) Hedgerows Waterbodies Other national priority habitats Habitats identified as Green Infrastructure Habitats covered by Biodiversity Opportunity Mapping	DQE1, DQE3, DQ12
North Lincolnshire Local Plan May 2003 saved policies	Habitats within nature conservation designations Hedgerows Woodland	LC1, LC2, LC3, LC4, LC12
NCA Profile: 39 Humberhead Levels	Wetland Ditches and drains (but not minor field ditches)	SEO1, SEO2

2.6 Approach to Identification of Suitable Habitat Interventions

2.6.1 Suitable habitat interventions have been considered with reference to the factors influencing the baseline habitat condition, as determined through application of the prescribed Site Condition Assessment criteria during the baseline site surveys.

2.6.2 Good practice guidance (Natural England, 2021) emphasises that ‘measures to enhance existing habitats must provide a significant and demonstrable uplift in distinctiveness and/or condition to record additional biodiversity units.’ When investigating options for meaningful habitat enhancement to uplift condition, two types of habitat intervention have been considered. These are:

- Habitat management interventions to improve the condition of existing habitats.
- Habitat trading interventions to replace an existing habitat with one of higher distinctiveness.

2.6.3 When considering habitat management interventions, due consideration has also been to whether the possible interventions are realistic (in terms of the site conditions and timeframe for delivery of the target condition), practicable (in terms of deliverability by a landscape contractor), and honest. Woodlands are particularly pertinent to these considerations, as the Site Condition Assessment criteria for woodlands strongly link baseline condition with characteristics related to age and naturalness. Therefore, as example, where a woodland is poorly performing against the criteria with reference to a lack of natural regeneration, this cannot be rectified by new plantings. As further examples in relation to this point, introduction of woodland ground flora, while beneficial, cannot be considered to create a woodland National Vegetation Classification (NVC) community where this did not exist previously so the woodland cannot be scored as if it is a semi-natural woodland. Planting of flora that in other circumstances could be considered ancient woodland indicator species cannot be used to score a secondary woodland as if it is ancient woodland or lowland mixed deciduous woodland (priority habitat).

2.6.4 Biodiversity Metric 3.0 has been constructed to permit some habitat trading options and to prohibit others. This generally relates to the distinctiveness of the baseline habitat relative to that proposed to replace it, with only trading of low and medium distinctiveness habitats permitted. Where habitat trading is permissible, options have again only been put forward where this is realistic, practicable, and honest.

2.6.5 An example of a permissible habitat trade would be the conversion of ‘modified grassland’ to ‘other neutral grassland’. This is an option that is realistic and practicable in terms of timeframes for delivery, availability of suitable management techniques (e.g. mowing, reseeded etc), and available information on the likelihood of success (i.e. difficulty). An example of an unacceptable habitat trade within Biodiversity Metric 3.0 would be loss of lowland calcareous grassland (a high distinctiveness habitat) to create a biodiversity pond. Similar trading rules apply in relation to habitat compensation and at times the metric can be a blunt instrument that merits further consideration and review. For example, the metric does not permit creation of species-rich grassland to compensate for losses of Open Mosaic Habitats (OMH), even though the former is a recognised component of OMH. However,

the metric does permit consideration of such solutions offline as 'bespoke mitigation packages', provided BNG is otherwise achievable. Where bespoke mitigation packages have been relied on, these are clearly identified and have been discussed and agreed with relevant stakeholders.

- 2.6.6 Another important consideration relates to the principal of 'additionality'. Interventions proposed to achieve BNG must make a new contribution to nature conservation i.e. a conservation outcome that would not have occurred without the intervention. For example, ongoing favourable management of grassland habitats would not offer anything additional if suitable regimes are already in place and these regimes would otherwise have continued.

2.7 Limitations, Assumptions and Constraints

- 2.7.1 There are no limitations to the field surveys completed for this study. The surveys were completed at a suitable time of year for the correct identification of habitats and the appraisal of their relative condition (Joint Nature Conservation Committee, 2016).
- 2.7.2 All habitats were mapped and measured in ArcGIS using appropriate base mapping (Ordnance Survey Mastermap). Therefore, while all the habitat areas calculated are approximations they are as accurate as practicable. The total habitat area (hectares) entered into the Metric is the extent of terrestrial habitats within the Order Limits and therefore omits the area of land covered by rivers (which are reported based on their linear extent in kilometres). Therefore the area stated is slightly smaller than the land area covered by the Order Limits.
- 2.7.3 The current Site Condition Assessment criteria (Natural England, 2021), while much improved relative to the previous iteration, retain some inconsistencies. One inconsistency relevant to this report relates to assessment of open space within woodlands. In simple terms, the current open space criterion advises that woodlands in optimal condition will have open space representing 10-20% of the total woodland area, and that increasing increments of open space over this indicates declining woodland condition. However, the criterion does not explain how to score woodlands which are completely lacking in open space (a common scenario within recent plantations), although the inference would also be that such woodland is not in optimal condition and should therefore be scored less favourably than woodland with 10-20% open space. This is the approach taken in this assessment, as closed canopy woodland is generally not optimal for biodiversity. This is not considered a limitation given the woodlands concerned are all of relatively young age and this approach would not alter the conclusions of the Site Condition Assessment.
- 2.7.4 The assessment is based on the indicative design and this may be subject to further change prior to submission of the detailed design. However, the assessment demonstrates that BNG is feasible and securable, and the committed level of BNG would need to be achieved later even if there is a need to amend the configuration of the habitats that will be created to achieve this.

The assessment will be updated to support agreement of the final LBMEP the provision of which will be a Requirement of the DCO. If the layout of the proposed new habitats needs to be amended at detailed design, then the aim will be to achieve comparable habitat connectiveness/ cohesiveness.

2.7.5 A conservative approach has been used within the calculations to account for uncertainties regarding the final layout for the Proposed Development. The current assessment is therefore precautionary (i.e. worst-case, both in terms of losses and in the gains achievable) and there are a number of reasons why the land required to achieve the committed gain and its location may change later. Specifically:

- the current assessment takes a worst-case position and assumes that all land within the Proposed PCC Site that has not been allocated for biodiversity enhancement would be permanently lost to buildings and hard landscaping. This is overly precautionary, but it is a necessary assumption until the final site layout is fixed following detailed design.
- the potential condition (a quality indicator) achievable for all new habitats is precautionary and likely overly so. So, as example of this, all new grasslands have been assumed to achieve 'moderate' condition even though 'fairly good' condition is realistically achievable. Similarly, the attenuation pond is assumed to achieve 'poor' condition even though a higher condition might be achievable later after consideration of the design options available (but noting the preference for a concrete liner).
- realistic precautionary timeframes are set within the metric for the committed habitat creation i.e. up to ten years to achieve target condition of grassland habitats. This represents a typical management period when establishing new habitats. In reality, given the proposed management regimes, measurable biodiversity gains for wildlife (e.g. invertebrates) from the new grasslands can be expected by Year 5 and before the final target condition is achieved for the habitat itself.
- no claims are made that the new habitats would represent priority habitats. Instead, the only aim is to achieve a genuine enhancement. So, for example, the existing poor quality 'modified grasslands' will be replaced with habitat more typical of favourably managed semi-natural grasslands i.e. 'other neutral grassland'. The management regimes necessary to achieve this are set out in the LBMEP, and the standard guidance (Natural England, 2021) advises that such habitat has a 'low difficulty of creation'. Given this it is reasonable to assume that the committed habitats can and will be delivered.

2.7.6 The vegetation cleared for construction of the existing AIL Route for Keadby 2 Power Station does not represent a habitat loss attributable to the Proposed Development but there will still need to be habitat reinstatement after construction. The responsibility and timescales for delivering this habitat reinstatement are currently controlled by conditions on planning permission

- PA/2019/1595 as varied by planning permission PA/2021/188. Under the draft DCO, it is proposed that these permissions will effectively be extended, and the matters controlled by condition will be secured by equivalently worded requirements in Schedule 2 of the draft DCO (**Application Document Ref. 2.1**) [**APP-005**]. Given the existing requirements, restoration of the land affected by the existing AIL Route cannot contribute to BNG for the Proposed Development as it does not represent additionality. Therefore, the existing haul road has been treated as no change within the metric.
- 2.7.7 Assumptions and professional judgement were applied for all rivers and ditches relevant to the Proposed Development where field surveys were not undertaken (because the relevant land areas whilst in the Order Limits are not required for and would be unaffected by the Proposed Development). A similar approach was taken where access was not feasible and/or safe.
- 2.7.8 The river assessor visited the Stainforth and Keadby Canal River to appraise the affected reach, however the Hatfield Waste Drain (**Figure 2**) was not subject to a MoRPh survey as access to the channel was poor given the steep bank profile and proximity to a major road. Sufficient data to assess condition and complete the MoRPh survey proforma was available for the latter from prior water vole surveys (**Appendix 11F: Riparian Mammal Survey Report of ES Volume II, Application Document Ref 6.3.17, [APP-081]**), aquatic ecology surveys (**Appendix 11G: Aquatic Ecology Survey Report of ES Volume II, Application Document Ref 6.3.18, [APP-082]**), the Water Framework Directive Assessment Report (Application Document Ref 6.3.21, **APP-085**), current aerial imagery and Google Streetview.
- 2.7.9 Ditches 6 to 20 and ditch 22 were assigned a habitat condition score retrospectively using a reasonable precautionary approach and professional judgement to prevent under-estimating the value of the baseline habitat.
- 2.7.10 A 'worse-case' scenario has been assessed for the cooling water intake i.e. it has been assumed that the Canal Water Abstraction Option will be selected necessitating construction of a structure on the Stainforth and Keadby Canal. The River Water Abstraction Option has been discounted as, even if selected, no new construction works are proposed other than installation of an eel screen within the existing built footprint of the existing structure.
- 2.7.11 Consistent with the published guidance (Natural England, 2021) it is emphasised that Biodiversity Metric 3.0 uses habitats as a proxy for biodiversity and therefore represents a simplification of the 'real world'. Furthermore, while the scoring of habitats is informed by ecological reasoning and the available evidence, the outputs of biodiversity unit calculations are not scientifically precise or absolute values. The metric and its outputs should therefore be interpreted, alongside ecological expertise and common sense, as an element of the evidence that informs plans and decisions. The metric is not a total solution to biodiversity decisions. The metric, for example, helps determine how

much new or restored habitat is needed to compensate for a loss of habitat, but it does not tell you the appropriate composition of plant species to use.

3.0 BASELINE CONDITIONS

3.1 Relevant Habitats

3.1.1 A Habitat Baseline Plan is provided as **Figure 1**. This codes the relevant habitats based on the UKHab classification used in the metric but is otherwise based on the information originally presented on the Phase 1 Habitat Map included within **Appendix 11C: Preliminary Ecological Appraisal Report (ES Volume II, Application Document Ref. 6. 3.14, APP-078)**.

3.1.2 The habitats that would be affected by permanent or temporary land-take for the Proposed Development (excluding the temporary habitat losses defined in Section 5.2) comprise:

- modified grasslands encompassing species-poor improved and poor semi-improved neutral grasslands (located at the Proposed PCC Site, construction laydown area 2c, and the Highway Improvements on the A18);
- dense scrub comprising stands of mixed scrub and hawthorn dominated scrub (located respectively on the boundary of the Proposed PCC Site with the former Keadby Ash Tip, and in the wayleave of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation);
- ephemeral/ short perennial vegetation contributing to open mosaic habitats (OMH) (located on the south-west corner of the Proposed PCC Site where there is a minor overlap with the margin of the former Keadby Ash Tip);
- intensively managed arable farmland (located within areas proposed for temporary construction laydown);
- unvegetated disturbed bare ground (located within the temporary soil storage compound for Keadby 2 Power Station, part of the Proposed PCC Site);
- a minor field ditch (Drain 4 located within Proposed PCC Site);
- watercourses comprising the Hatfield Waste Drain (which is crossed by the existing Mabey Bridge which is to be replaced), and the Stainforth and Keadby Canal (within which the potential Canal Water Abstraction Option would be constructed); and
- existing area of hardstanding and other sealed surfaces (located at the Proposed PCC Site with land formerly used as laydown and car parking during construction of Keadby 2 Power Station).

3.1.3 Additional areas of land are to be utilised solely for purposes of landscape and biodiversity enhancement. These comprise:

- modified grasslands to be converted to other neutral grassland (located on road verges or in the retained areas of the small fields adjacent to the

permanent access road off the A18, and retained vegetation within the Proposed PCC Site on the alignment of the overhead electricity transmission lines associated with the existing National Grid 400kV Substation);

- existing tarmacadam car park (sealed surface) to be broken out and replaced (located adjacent to the permanent access road off the A18); and
- minor ditches (located on the boundaries of the Proposed PCC Site).

3.2 Other Relevant Ecological Features

3.2.1 The following designations (Environmental Statement (ES) - Figure 11.1 and 11.2, **APP-121** and **APP-122**) coincide with the land required for the Proposed Development:

- Humber Estuary Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and Ramsar site (which is the location of the potential River Water Abstraction Option) – this designation does not influence the deliverability of BNG. No likely significant effects are predicted should the River Trent be chosen as the cooling water supply, refer to **Chapter 11: Biodiversity and Nature Conservation** (ES Volume I, Application Document Ref. 6.2.11, **APP-054**) including **Chapter 11: Biodiversity and Nature Conservation of the ES Addendum (Application Document Ref. 6.2.11 Rev 2)** and the Habitats Regulations Assessment Appropriate Assessment Report - Rev 2 (**Application Document Ref. 5.12, [REP1-006]**).
- Stainforth and Keadby Canal Corridor Local Wildlife Site (LWS) (within which the potential Canal Water Abstraction Option would be constructed) – there is no marginal vegetation at the location of the potential water abstraction which coincides with a vertical reinforced bank and the existing water intake structure for Keadby 2 Power Station. Consequently, this designation is not considered to constrain the deliverability of BNG.
- Hatfield Waste Drain LWS (which is adjacent to but is unaffected by the Highway Improvements on the A18) – no habitat loss would occur within the boundary of the LWS, so the LWS has no bearing on the deliverability of BNG.
- Keadby Warping Drain LWS (which is on the alignment of the existing cooling water discharge corridor) – no habitat loss would occur within the boundary of the LWS, so the LWS has no bearing on the deliverability of BNG.

3.2.2 In addition, the following ecological features also have specific relevance to the BNG assessment:

- The former Keadby Ash Tip – while this is a site of high biodiversity importance (refer to **Appendix 11C** of ES Volume II, Application Document Ref. 6. 3.14, **APP-078**), the habitats of greatest nature conservation value

are located at distance and would not be affected. The minor land take from a peripheral area would not compromise the biodiversity value of the former Keadby Ash Tip so this is not a substantive constraint to the deliverability of BNG. This point has been agreed with the relevant stakeholder (NLC).

- Habitats identified as Green Infrastructure and Biodiversity Opportunity areas on the Local Plan Policies Map - the relevant habitats are modified grasslands and a species-poor ditch, so inclusion of these habitats relates to the habitat linkages they provide rather than any specific nature conservation value of these habitats in isolation. As these habitats will benefit (see Section 2.5) from additional weighting within the metric, they are not perceived to have specific relevance to the ability to deliver BNG.
- Water vole – this proposed enhancement of ditches on the boundary of the PCC site is likely to benefit this species. As such, water vole is not a constraint to delivering BNG.

4.0 APPLICATION OF BNG GOOD PRACTICE PRINCIPLES

- 4.1.1 Ten good practice principles have been identified to provide a framework for achieving BNG (CIEEM, CIRIA & IEMA, 2016). A summary is provided below, see Table 2, to identify how each of these principles has been addressed when undertaking this BNG assessment and when developing the underpinning habitat restoration, creation and enhancement scheme detailed in the LBMEP.

Table 2: Review of the Proposed Development Against the BNG Good Practice Principles

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
Principle 1. Apply the Mitigation Hierarchy	Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.	Through the iterative design process, consideration was given to a range of design options. Decisions taken regarding the concept design of the Proposed Development were, where relevant and possible, informed by environmental appraisal and assessment work and by consultation with stakeholders. Care was taken to choose a site location of inherently low biodiversity value, and to avoid habitats of intrinsically higher value (the former Keadby Ash Tip). The approach to site selection and layout has been agreed with stakeholders.	Chapter 6: Consideration of Alternatives (Application Document Ref. 6.2, APP-049) including Volume I of the ES Addendum (Application Document Ref 6.2.1 – 6.2.7 Rev 03). The LBMEP (of which this appendix is part of) sets out the approach for compensating for residual habitat losses and securing a net gain for biodiversity.
Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere	Avoid impacts on irreplaceable biodiversity - these impacts cannot be offset to achieve No Net Loss or Net Gain.	The Proposed Development is located on land of inherently low biodiversity value and	Chapter 11: Biodiversity and Nature Conservation (Application Document Ref. 6.2.11, APP-054) including

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
		consequently no irreplaceable habitats would be affected.	Chapter 11: Biodiversity and Nature Conservation of the ES Addendum (Document Ref. 6.2.11 Rev 03).
Principle 3. Be inclusive and equitable	Engage stakeholders early, and involve them in designing, implementing, monitoring and evaluating the approach to Net Gain. Achieve Net Gain in partnership with stakeholders where possible, and share the benefits fairly among stakeholders.	NLC (the authority that will be responsible for agreeing and discharging the final LBMEP), along with other relevant stakeholders, has been consulted regularly from scoping onwards. This has included provision of information and engagement in relation to site selection, impact avoidance, proposed specifications for landscape and biodiversity mitigation and enhancement, and agreement of use of metric to demonstrate and measure Net Gain.	Consultation Report (Applicant Document Ref. 5.1, APP-030). NLC Deadline 2 Submission (REP2-015).
Principle 4. Address risks	Mitigate difficulty, uncertainty and other risks to achieving Net Gain. Apply well-accepted ways to add contingency when	The measures required to address risk are inherent to the approved Biodiversity Metric 3.0. The proposed habitat	Biodiversity Metric 3.0 (Natural England, 2021). LBMEP (of which this appendix is part of).

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
	calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.	interventions to achieve BNG are realistic and deliverable.	
Principle 5. Make a measurable Net Gain contribution	Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.	An approved metric (Biodiversity Metric 3.0) has been utilised to measure the gain that can be achieved. In so doing, habitats are enhanced within green infrastructure corridors identified in the Local Plan, and on land connecting to Local Wildlife Sites.	This report.
Principle 6. Achieve the best outcomes for biodiversity	Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly-justified choices when: <ul style="list-style-type: none"> - Delivering compensation that is ecologically equivalent in type, amount and condition, 	All the proposed habitat interventions are realistic and deliverable, and no novel or unproven techniques are required to achieve these habitats. Equivalent or better habitats are provided on-site to compensate all losses, and this has been agreed	LBMEP (of which this appendix is part of). NLC Deadline 2 Submission (REP2-015) and subsequent signed Statement of Common Ground with North Lincolnshire Council

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
	<p>and that accounts for the location and timing of biodiversity losses.</p> <ul style="list-style-type: none"> - Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation. - Achieving Net Gain locally to the development while also contributing towards nature conservation priorities at local, regional and national levels. - Enhancing existing or creating new habitat. - Enhancing ecological connectivity by creating more, bigger, better and joined areas for biodiversity. 	<p>with NLC. The proposed habitats connect to and therefore bolster existing sites of biodiversity value (LWSs and the former Keadby Ash Tip).</p>	<p>submitted at Deadline 6 (REP6-005).</p>

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
Principle 7. Be additional	Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e. do not deliver something that would occur anyway).	The proposed interventions are specific to, and will only be delivered because of, the Proposed Development.	Chapter 11: Biodiversity and Nature Conservation (Application Document Ref. 6.2.11, APP-054) including Chapter 11: Biodiversity and Nature Conservation of the ES Addendum (Document Ref. 6.2.11 Rev 03). LBMEP (of which this appendix is part of).
Principle 8. Create a Net Gain legacy	Ensure Net Gain generates long-term benefits by: <ul style="list-style-type: none"> - Engaging stakeholders and jointly agreeing practical solutions that secure Net Gain in perpetuity. - Planning for adaptive management and securing dedicated funding for long-term management. - Designing Net Gain for biodiversity to be resilient to 	NLC (the authority that will be responsible for agreeing and discharging the final LBMEP) has been consulted on the proposed approach and has confirmed agreement. The habitats will be maintained for a minimum of 25 years as set out in the LBMEP. Habitat monitoring is committed and will provide the information	NLC Deadline 2 Submission (REP2-015) and subsequent signed Statement of Common Ground with North Lincolnshire Council submitted at Deadline 6 (REP6-005). LBMEP (of which this appendix is part of).

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
	<p>external factors, especially climate change.</p> <ul style="list-style-type: none"> - Mitigating risks from other land uses. - Avoiding displacing harmful activities from one location to another. - Supporting local-level management of Net Gain activities. 	<p>needed to inform adaptive management.</p> <p>The proposed habitats are of types that would not reasonably be anticipated to be affected by climate change over the prescribed maintenance period.</p>	
<p>Principle 9. Optimise sustainability</p>	<p>Prioritise BNG and, where possible, optimise the wider environmental benefits for a sustainable society and economy.</p>	<p>The relevant guidance (CIEEM, CIRIA & IEMA, 2016) provides no further explanation to inform interpretation of this principle.</p> <p>The Proposed Development is accompanied by a statement on sustainability, as well as sufficient evidence on the approach to biodiversity avoidance, protection and enhancement.</p>	<p>This report.</p> <p>Chapter 6: Consideration of Alternatives (Application Document Ref. 6.2, APP-049) including Volume I of the ES Addendum (Application Document Ref 6.2.1 – 6.2.7 Rev 03).</p> <p>Chapter 11: Biodiversity and Nature Conservation (Application Document Ref. 6.2.11, APP-054) including Chapter 11: Biodiversity and</p>

Principle	Associated guidance	How the principle has been addressed by the Proposed Development	Location of further information
			Nature Conservation of the ES Addendum (Document Ref. 6.2.11 Rev 03). Chapter 17: Climate Change and Sustainability (Application Document Ref. 6.2.17, APP-060).
Principle 10. Be transparent	Communicate all Net Gain activities in a transparent and timely manner, sharing the learning with all stakeholders.	This report has been prepared and structured with reference to good practice guidance (Natural England, 2021; CIEEM, 2021). The current good practice metric workbook (Biodiversity Metric 3.0) has been utilised and is available for examination by stakeholders. NLC (the authority that will be responsible for agreeing and discharging the final LBMEP), along with other relevant stakeholders, has been consulted throughout the application process.	This report. NLC Deadline 2 Submission (REP2-015) and subsequent signed Statement of Common Ground with North Lincolnshire Council submitted at Deadline 6 (REP6-005).

5.0 PROPOSED DESIGN

5.1 Permanent Habitat Losses

- 5.1.1 Biodiversity Metric 3.0 only requires assessment of permanent habitat impacts. These are taken to encompass all permanent or temporary land-take where habitats will be lost and where the original baseline habitat cannot be recreated to the same or better condition within two years from the date of the impact occurring.
- 5.1.2 The permanent habitat losses have been digitised into the GIS, with reference to the land needed for the Proposed Development, to permit the permanent habitat losses to be quantified. The resultant habitat areas and lengths have been entered into the metric accompanying this report.
- 5.1.3 The relevant worst case habitat losses and the locations of these are summarised below in **Table 3**.

Table 3: Permanent habitat losses to the Proposed Development (as recorded in the metric)

Affected habitat	Construction activity	Habitat Loss
Arable	Construction laydown areas 2a and 2b	10.43ha
Modified grassland	Site clearance for construction of Proposed PCC Site	10.22ha
	A18 Junction Improvement and Mabey Bridge replacement	0.22ha
	Construction laydown area 2c	2.60ha
Unvegetated disturbed ground (unsealed land currently within Keadby 2 construction site)	Site clearance for construction of Proposed PCC Site	4.58ha
Mixed scrub	Site clearance for construction of Proposed PCC Site	0.09ha
Hawthorn scrub	Site clearance for construction of Proposed PCC Site	0.23ha

Affected habitat	Construction activity	Habitat Loss
OMH	Site clearance for construction of Proposed PCC Site	0.25ha
Ditch	Infilling of minor drain (Drain 4) bisecting Keadby Common during site clearance for Proposed PCC Site.	0.38km
	Construction of bridge for Emergency Vehicle Access Road over Glew Drain.	0.015km
Stainforth and Keadby Canal (in-channel habitat only)	Intrusion into channel from proposed Canal Water Abstraction Option.	0.013km
Hatfield Waste Drain (riparian habitat only)	A18 Junction Improvement and Mabey Bridge replacement (note the impact on terrestrial habitat is also factored, see above).	0.136km

5.2 Temporary Habitat Losses

5.2.1 Where a habitat is impacted for a short period of time before being restored back to the same habitat in its original condition or better this can be considered a temporary loss. In such circumstances, it is not necessary to record the loss within Biodiversity Metric 3.0 and instead the habitat is recorded as 'retained'.

5.2.2 Biodiversity Metric 3.0 only considers losses to be temporary when the original baseline habitat will be recreated in the same or better condition within 2 years from the date of the impact occurring. This requires the habitat creation/restoration to be complete, not just that seed has been sown or whips planted. This means that the temporary loss option generally only applies to habitats of relatively simple structure and composition and of relatively poor condition. For example, it could encompass impacts affecting species-poor modified grasslands such as sports pitches and agriculturally improved pasture, but not permanent species-rich grasslands or scrub habitat.

5.2.3 In relation to the Proposed Development, the following temporary habitat losses are identified and are excluded from the BNG calculation:

- Installation of an eel screen for the proposed River Water Abstraction Option (if chosen) given this would only affect estuarine sediments

deposited over the existing concrete apron of the intake structure, and within an area already subject to periodic dredging to maintain the intake.

- Disturbance of and/or laydown on the mown modified grassland on the flood embankment adjacent to the existing river water intake during installation of an eel screen (see above).
- Disturbance of and/or laydown on the modified grassland when the adjacent existing Mabey Bridge is replaced for the Proposed Development.
- Small-scale cut and cover crossings of ditches that might be required during installation of the Potential Electrical Connection to Northern Powergrid 132kV Substation, where the existing substrates would be reinstated, and the affected modified grassland flora is typified by a limited suite of grasses and ruderal herbs that is capable of re-establishing in one to two growing seasons.
- Replacement of the gatehouse at the site entrance of the A18 within the existing footprint of the existing gatehouse and its associated hardstanding.

5.2.4 Consistent with the above, use of existing hardstanding of no inherent biodiversity value for laydown is also considered a temporary loss even if required for a period longer than 2 years. This is consistent with the ‘common sense’ principle within the guidance (Natural England, 2021), given use of such land is not likely to meaningfully impact upon biodiversity and because it reduces the need for losses of semi-natural habitats elsewhere. This rationale also covers construction (if chosen) of the proposed Canal Water Abstraction Option, which will be located within the footprint of an area of hardstanding installed during construction of the consented Keadby 2 Power Station canal water abstraction structure.

5.2.5 For purposes of clarity, as explained elsewhere within the application, it is re-stated that much of the land within the Order Limits will not be affected by the Proposed Development. For example, the Order Limits encompass locations where existing buried infrastructure would be utilized by the Proposed Development, the existing AIL route and associated bridge structures constructed for Keadby 2 Power Station that will be utilised during construction of the Proposed Development (on land within the Additional AIL Route), and other existing infrastructure to be utilised in manner consistent with its intended purposes e.g. use of existing roads and the port facilities at Keadby.

5.3 Development of the Proposed Design

5.3.1 The proposed design has been developed to respond specifically to relevant local and national biodiversity strategies, as summarised below in Table 4. Further information is provided in the LBMEP (of which this appendix is part of). The proposed habitat interventions to achieve No Net Loss and BNG can be summarised as:

- Creation of other neutral grassland to compensate for losses of modified grassland (including conversion of an existing hardstanding car park to grassland);
- New mixed scrub plantings to compensate for losses of all scrub types;
- New hedgerow plantings to extend existing retained hedgerows;
- Provision of a Sustainable Urban Drainage feature;
- Enhancement of ditches on the boundary of the PCC Site to compensate for the loss of Drain 4;
- Enhancement of the riparian vegetation structure adjacent to the Hatfield Waste Drain through the above scrub planting; and
- Enhancement of the Stainforth and Keadby Canal through creation of marginal emergent vegetation to enhance the north bank.

5.3.2 The above habitat gains can largely be achieved through interventions within the Order Limits and within land controlled by the Applicant. The exception is the proposed intervention within the Stainforth and Keadby Canal which requires the agreement of the Canal and River Trust, a matter that has been discussed and agreed in principle with the Canal and River Trust.

5.3.3 As set out in the LBMEP, the following additional species-specific measures are proposed in addition to the habitat interventions measured by the BNG assessment:

- 3 No. pole mounted barn owl towers;
- 5 No. Schwegler 1FD or comparable bat boxes suitable for maternity roosting;
- 5 No. Schwegler 2F universal bat boxes, or comparable boxes;
- 5 No. tawny owl nesting boxes (suitable also for other bird species requiring larger nesting cavities); and
- ring-barking of suitable trees to enhance the resource of standing deadwood available to willow tit.

5.3.4 The above species-specific measures will be provided in the former Keadby Ash Tip which is located outside the Order Limits but otherwise within the control of the Applicant. The target species listed above are those that require mature trees or standing deadwood for roosting or nesting, conditions that are currently absent or in short supply due to the relatively young age of the woodland and scrub present within and adjacent to the Proposed Development Site.

Table 4: Response to relevant biodiversity strategies

Plan	Response
Lincolnshire LBAP, 3rd Edition	<p>The Proposed Development has sought to avoid impacting the OMH of the former Keadby Ash Tip. Where an impact on a small area of ancillary connected habitat could not be avoided the proposed habitat mitigation has been discussed and agreed with NLC. Suitable comparable habitat (flower-rich grassland) will be created on land adjacent to the former Keadby Ash Tip, extending such habitat beyond the boundaries of the former Keadby Ash Tip.</p> <p>The wider approach to creating and enhancing grassland is consistent with the objective to <i>“create 40ha of lowland meadow with priority given to buffering, linking or expanding sites meeting LWS criteria.”</i></p>
North Lincolnshire LDF Core Strategy June 2011	<p>The BNG approach is consistent with the aim to <i>“protect, enhance and restore biological diversity.”</i></p> <p>The proposed habitats include interventions that will improve the biodiversity value of identified green infrastructure e.g. through management to enhance ditches, and the creation of flower-rich grassland next to watercourses.</p>
North Lincolnshire Local Plan Publication Plan October 2021	<p>The BNG approach include provisions for the long-term management and maintenance of existing and new landscaping.</p> <p>It also enhances important natural landscape features, including rivers and identified green infrastructure, with reference to the published Biodiversity Opportunity Mapping. The proposals complement existing habitats of high biodiversity importance including the adjacent former Keadby Ash Tip and nearby LWSs.</p>
National Pollinator Strategy	<p>The BNG approach engages with the objectives of the strategy by providing <i>“new flower-rich habitats”</i> that are <i>“joined-up to existing sites”</i> of known importance for invertebrates e.g. the former Keadby Ash Tip.</p>
NCA Profile: 39 Humberhead Levels	<p>The proposed enhancement of ditch habitats reflects the objective to bring ditches <i>“under sound rotational management so that they continue to function while also retaining a</i></p>

Plan	Response
	<p><i>proportion of emergent vegetation, thus forming key links between wetland and other semi-natural habitats, and providing important habitats for species such as water voles and dragonflies.”</i></p> <p><i>It also contributes to “the introduction of a wider range of habitats within arable areas, such as permanent grassland field margins and buffers alongside watercourses and wetland habitats, and linking them where possible to other semi-natural habitats to create more resilient networks and enable species movement ...”</i></p>

6.0 BNG METRIC

6.1 Overview

6.1.1 The Biodiversity Metric 3.0 workbook used to make the BNG assessment is captured within this document (as **Annex B**) and will be provided to relevant stakeholders on request. The habitat parcels referenced in the workbook relate directly to the Habitat Baseline Plan (**Figure 1**), the River Baseline Plan (**Figure 2**) and the Post-Development Plan which is provided as **Figure 1** of the LBMEP. The habitat conditions applied to the relevant habitats are explained in **Annex A** to support the supplementary notes entered into the workbook.

6.2 Ability to Deliver No Net Loss

6.2.1 The assessment concludes that planning policy requirement for No Net Loss can be achieved, either through direct compensation for the habitats lost or through replacement with habitats of higher distinctiveness and/or condition. Only one habitat trading exception, relating to OMH, is recorded in the workbook (**Annex B**). However, acknowledging the metric is a 'blunt instrument' (see Section 2.6), this is not considered to be a material exception, as explained further below.

6.2.2 It is not possible to compensate like for like for the minor loss of OMH to the Proposed development. However, functionally comparable habitat is delivered with the shortfall in OMH addressed through the proposed native flower-rich other neutral grassland creation and enhancement. The habitat can be expected to benefit pollinators and other terrestrial invertebrates i.e. species groups for which OMH is important.

6.2.3 In specific relation to the OMH, the current approach for assessing the balance between habitat losses and gains requires like for like replacement of OMH regardless of the specific quality and scale of loss i.e. there is no flexibility within the metric to consider context (although offline agreement of bespoke mitigation is otherwise permissible). Creation of new OMH is not possible as suitable ground conditions are not available and, even then, there would be low confidence in the ability to reinstate comparable OMH. The affected OMH is otherwise, as explained in **Chapter 11** (ES Volume I, **Application Document Ref. 6.2**) including **Chapter 11: Biodiversity and Nature Conservation of the ES Addendum (Document Ref. 6.2.11 Rev 03)**, not typical of the wider retained OMH resource within the former Keadby Ash Tip.

6.2.4 Of relevance to options for bespoke mitigation, Natural England has stated '*artificially created and planted areas that mimic semi-natural habitats such as species-rich grassland would also be in scope [of this habitat type]*' (Natural England, 2019). Accordingly, it is considered that creation of flower-rich grassland is a valid approach to address the small loss of OMH to the Proposed Development. This approach has been agreed with NLC. The proposed new grassland habitat will add to the diversity and complexity of existing flower-rich

habitats associated with the former Keadby Ash Tip and the connected Stainforth and Keadby Canal Corridor LWS (extending this into adjacent land), and therefore directly complements and diversifies habitat quality for the notable terrestrial invertebrate assemblage that is focussed on the former Keadby Ash Tip (as described in **Appendix 11C – ES Volume II (Application Document Ref. 6.3)**).

6.3 Ability to Deliver Biodiversity Net Gain

6.3.1 The assessment concludes that the planning policy requirement for BNG can be met, with the gains estimated as follows:

- 10.19% increase in habitat units
- 27.58% increase in hedgerow units
- 1.80% increase in river units

6.3.2 While there is currently no planning policy or legal requirement to deliver a specific quantum of BNG (with demonstration of a quantifiable gain being sufficient), the assessment indicates that the increase in habitat and hedgerow units is consistent with the 10% minimum BNG threshold to be mandated by the Environment Act 2021 for NSIP developments from 2025.

6.3.3 10% BNG cannot be achieved within the Order Limits in relation to river units, due to the baseline context of the relevant rivers (the heavily engineered Stainforth and Keadby Canal and the Hatfield Waste Drain), the tightly defined red line within which suitable BNG interventions have already been proposed, the presence of existing banktop vegetation of optimal structure (meaning further plantings are not feasible), and/ or other constraints that prevent creation of bank top habitats (existing hard landscaping, towpaths, other access and maintenance considerations). Given these considerations, it is not considered realistic to offer further habitat interventions of sufficient magnitude to realistically boost condition any higher than 'Fairly Good'. Therefore, it is considered that weight should be given to the clearly very minor habitat impacts from the Proposed Development (which do not meet the formal definition for meaningful encroachment, even though Metric 3.0 otherwise records a loss in habitat units), the fact that realistic interventions are proposed to achieve a measurable BNG, and the wider gains in terms of habitat and hedgerow units.

7.0 PROJECT IMPLEMENTATION AND CONSTRUCTION PLAN

7.1.1 The good practice requirement to provide a project implementation and construction plan is met by the following documents submitted with the application:

- Indicative Landscape and Biodiversity Plan (Application Document Ref. 4.15, **APP-024**); and
- Landscaping and Biodiversity Management and Enhancement Plan (of which this appendix is part of).

7.1.2 It is intended that these plans will be updated prior to construction as a Requirement of the DCO.

8.0 BNG MANAGEMENT AND MONITORING PLAN

8.1.1 The good practice requirement to provide a project implementation and construction plan is met by the following documents submitted with the application:

- Landscaping and Biodiversity Management and Enhancement Plan (of which this appendix is part of).

8.1.2 It is intended that this document will be updated prior to construction as a Requirement of the DCO.

9.0 REFERENCES

British Standards Institution (2021) BS 8683 Process for designing and implementing Biodiversity Net Gain. Specification. British Standards Institution.

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Natural England (2012) NCA Profile: 39 Humberhead Levels (NE339).

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Natural England (2021) Biodiversity Metric 3.0.

North Lincolnshire Council (2011) North Lincolnshire Local Development Framework Core Strategy (adopted 2011).

North Lincolnshire Council (2020) Emerging North Lincolnshire New Local Plan (Preferred Options (Regulation 18) consultation draft, 2020).

FIGURES



- LEGEND**
- Site Boundary
 - Cereal crops
 - Other neutral grassland
 - Modified grassland
 - Bramble scrub
 - Hawthorn scrub
 - Mixed scrub
 - Open mosaic habitats
 - Other woodland; broadleaved
 - Wet Woodland
 - Sparsely vegetated ground - ruderal/ephemeral
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ISSUE PURPOSE
BNG ASSESSMENT

PROJECT NUMBER
60625943

SHEET TITLE
Biodiversity Net Gain Baseline Habitats Sheet 1

SHEET NUMBER
Figure 1

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 BNG ASSESSMENT

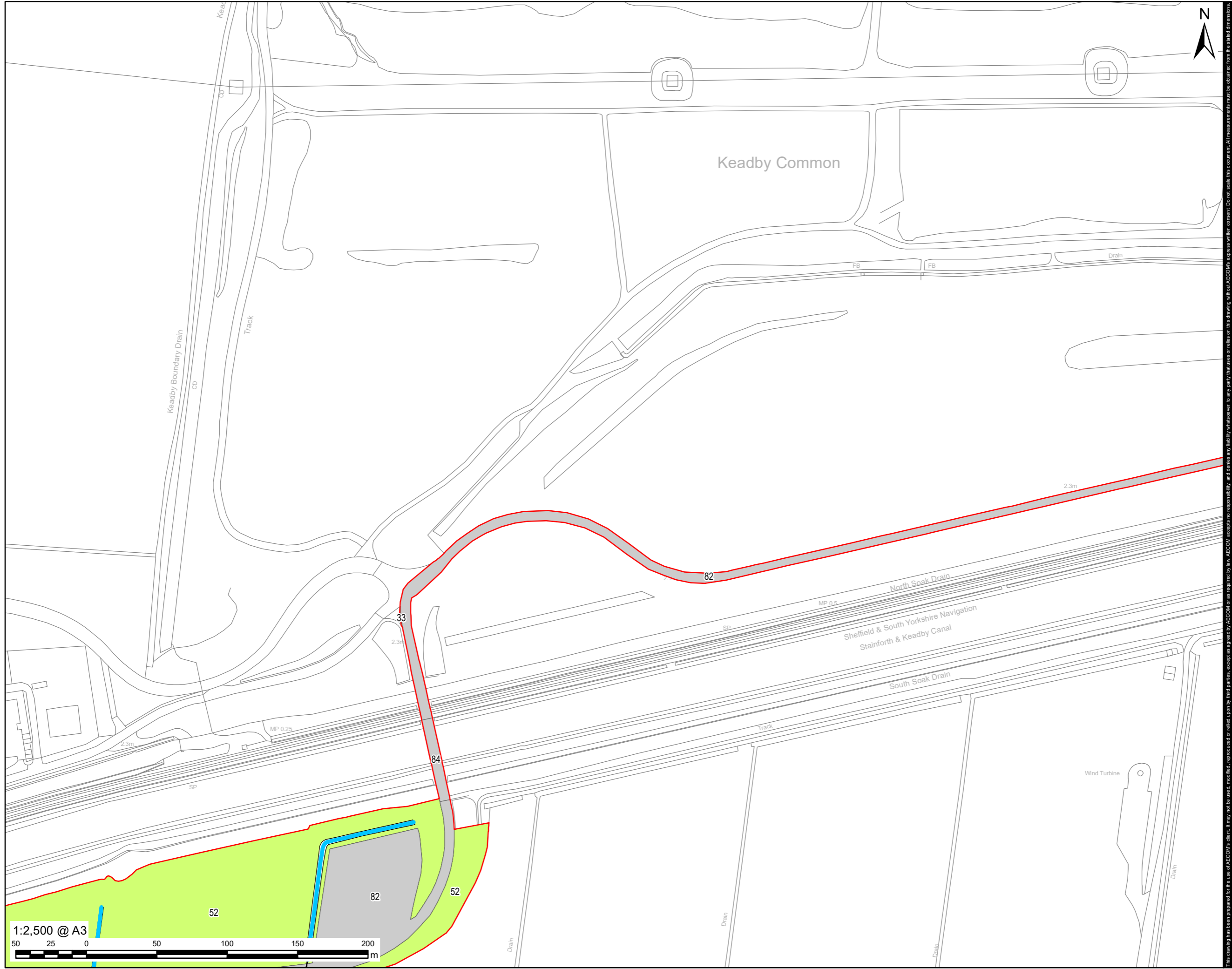
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SHEET TITLE
 Biodiversity Net Gain Baseline Habitats Sheet 2

SHEET NUMBER
 Figure 1



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PROJECT
The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

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Biodiversity Net Gain Baseline Habitats Sheet 3

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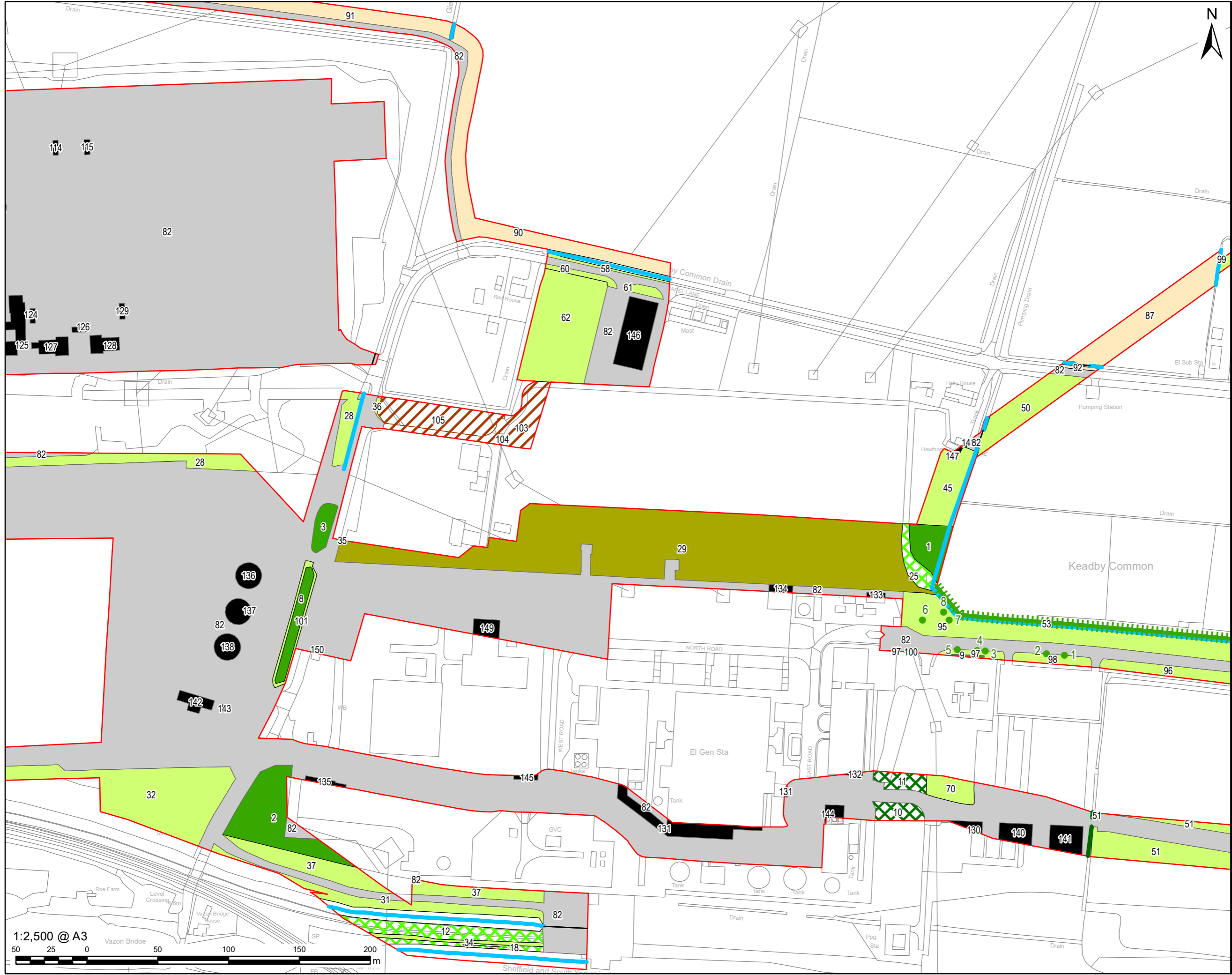
Biodiversity Net Gain Baseline Habitats Sheet 4

SHEET NUMBER

Figure 1



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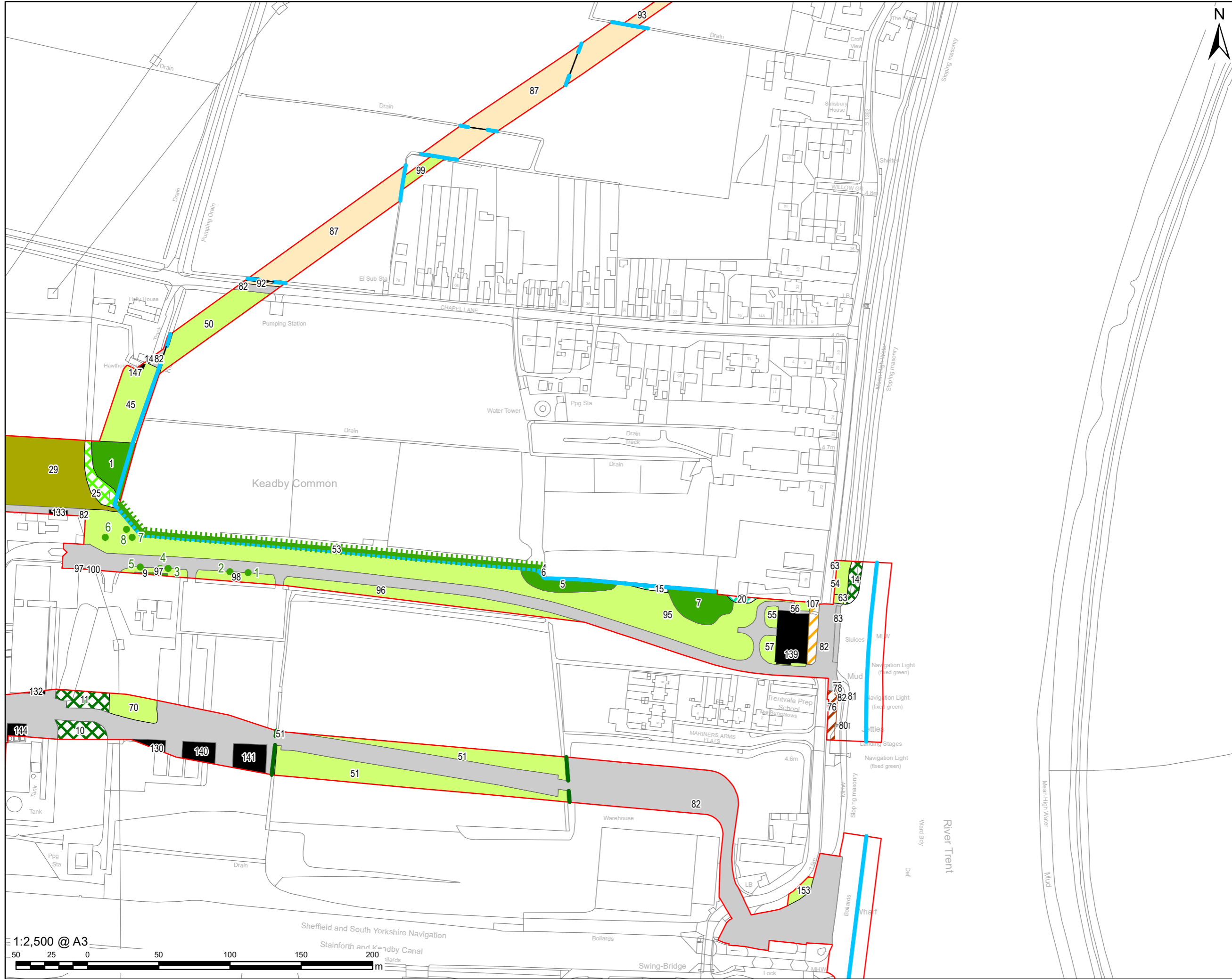
ISSUE PURPOSE
 BNG ASSESSMENT

PROJECT NUMBER
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SHEET TITLE
 Biodiversity Net Gain Baseline Habitats Sheet 5

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 Figure 1

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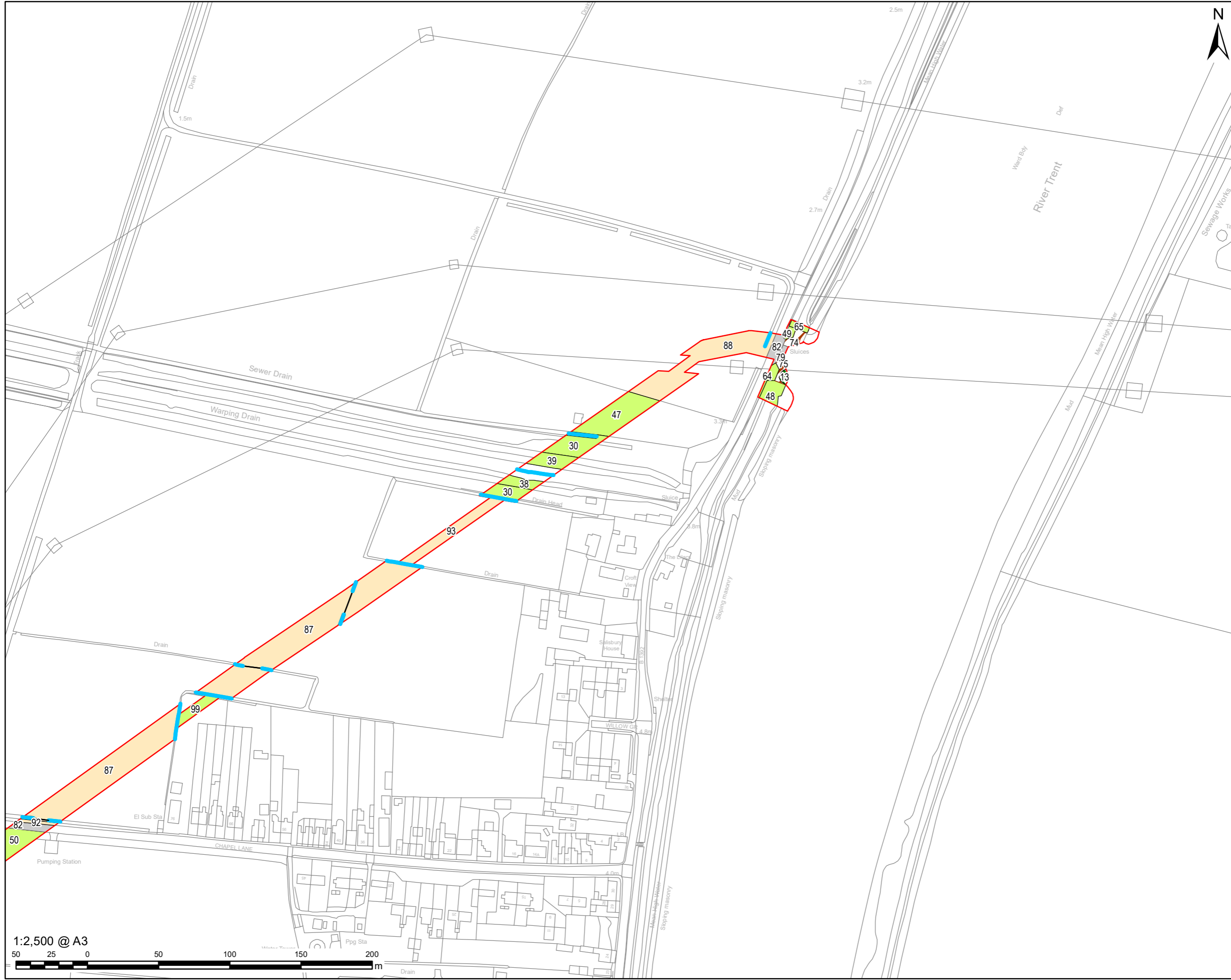
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BNG ASSESSMENT

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SHEET TITLE
Biodiversity Net Gain Baselinet Habitats Sheet 6

SHEET NUMBER
Figure 1

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BNG ASSESSMENT

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SHEET TITLE

Biodiversity Net Gain Baselinet Habitats Sheet 7

SHEET NUMBER

Figure 1

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PROJECT
 The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

CLIENT
 Keadby Generation Limited

CONSULTANT
 AECOM Limited
 2 City Walk
 Leeds
 LS11 9AR
 T: 0113 391 6800
 www.aecom.com

- LEGEND**
- Site Boundary
 - Cereal crops
 - Other neutral grassland
 - Modified grassland
 - Bramble scrub
 - Hawthorn scrub
 - Mixed scrub
 - Open mosaic habitats
 - Other woodland; broadleaved
 - Wet Woodland
 - Sparsely vegetated ground – ruderal/ephemeral
 - Urban - introduced shrub
 - Urban - Developed land; sealed surface
 - Urban - Developed land; sealed surface - building
 - Urban - artificial unvegetated, unsealed surface
 - Ditch - no longer exists
 - Culverted
 - Watercourse
 - Native Hedgerow - Associated with bank or ditch
 - Native hedgerow
 - Native species-rich hedgerow with trees
 - Urban - street tree

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ISSUE PURPOSE
 BNG ASSESSMENT

PROJECT NUMBER
 60625943

SHEET TITLE
 Biodiversity Net Gain Baseline Habitats - Watercourse & Hedgerow References - Sheet 1

SHEET NUMBER



Figure 2



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ISSUE PURPOSE

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SHEET TITLE

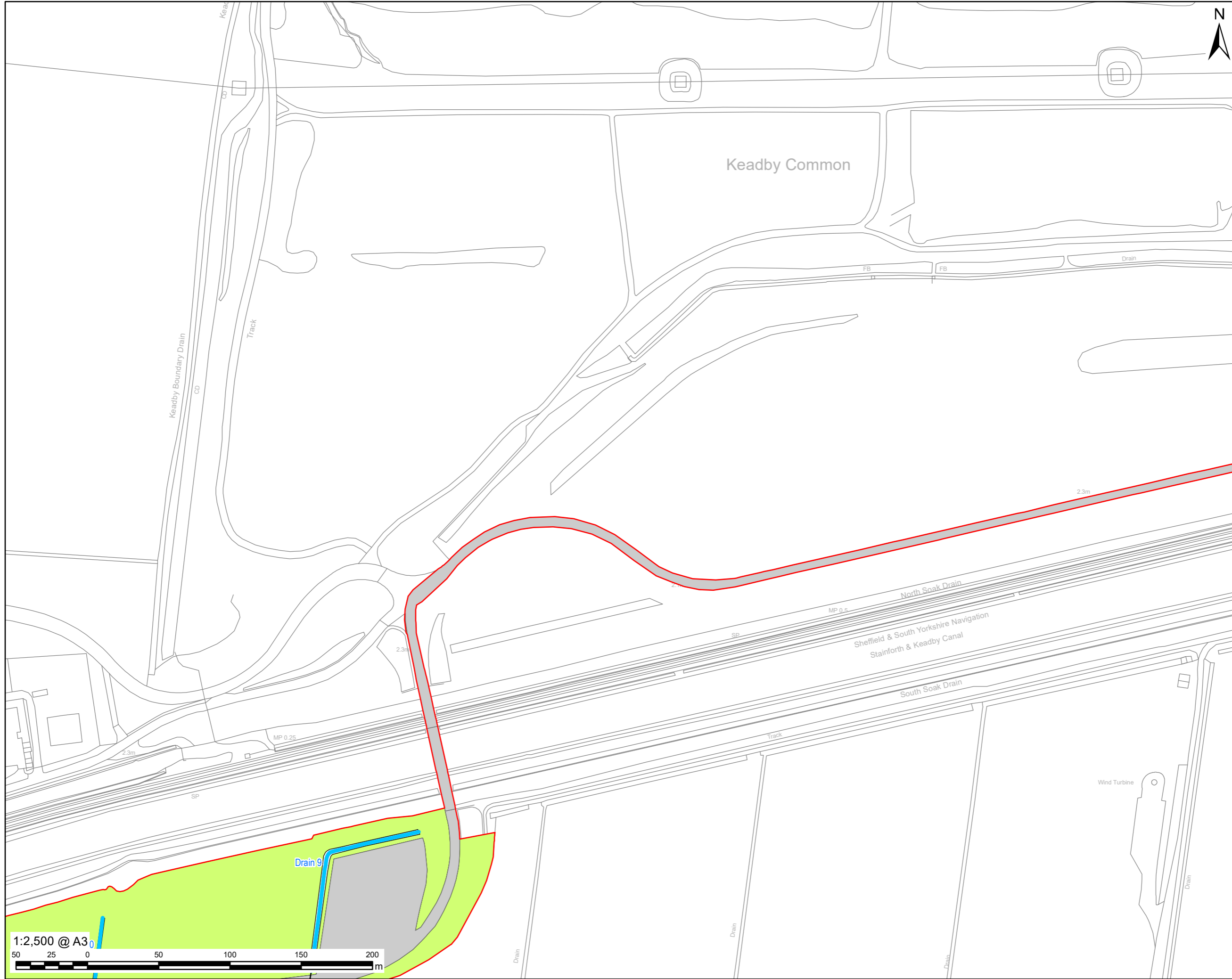
Biodiversity Net Gain
Baseline Habitats -
Watercourse & Hedgerow
References - Sheet 2

SHEET NUMBER

Figure 2



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ISSUE PURPOSE
BNG ASSESSMENT

PROJECT NUMBER
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SHEET TITLE
Biodiversity Net Gain
Baseline Habitats -
Watercourse & Hedgerow
References - Sheet 3

SHEET NUMBER



Figure 2



- Site Boundary
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PROJECT NUMBER

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SHEET TITLE

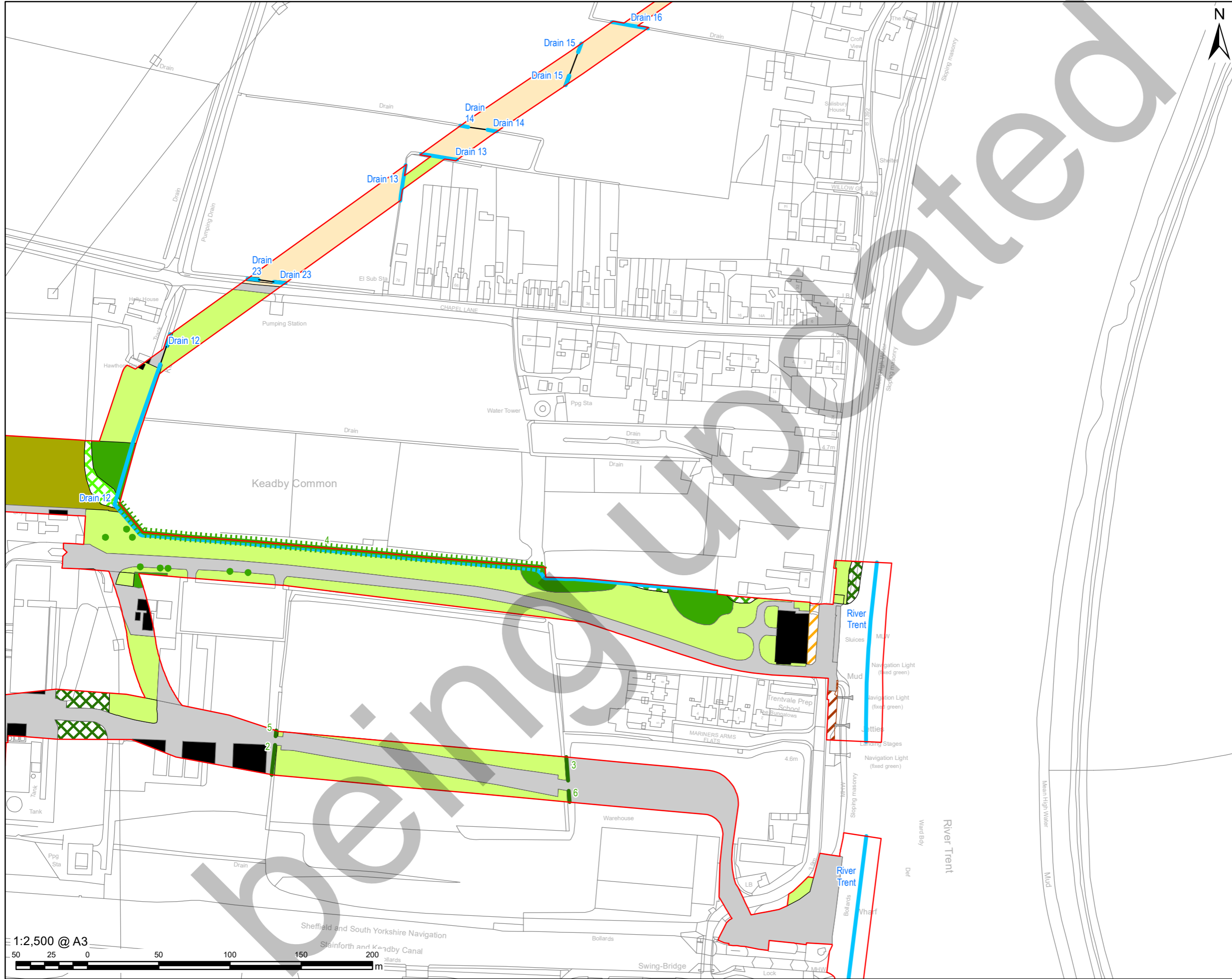
Biodiversity Net Gain
Baseline Habitats -
Watercourse & Hedgerow
References - Sheet 4

SHEET NUMBER

Figure 2



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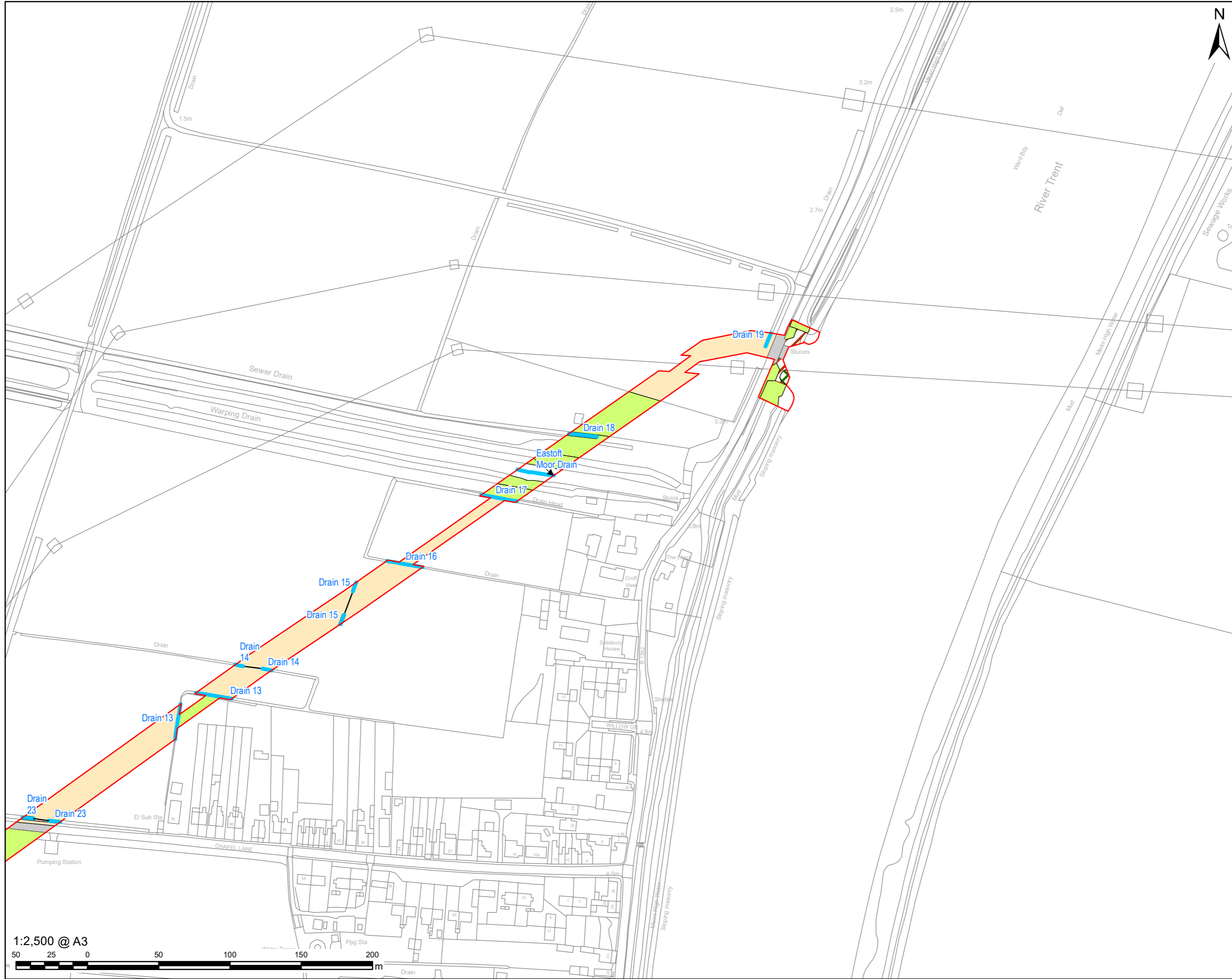
PROJECT NUMBER
60625943

SHEET TITLE
Biodiversity Net Gain
Baseline Habitats -
Watercourse & Hedgerow
References - Sheet 6

SHEET NUMBER
Figure 2



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ISSUE PURPOSE
 BNG ASSESSMENT

PROJECT NUMBER
 60625943

SHEET TITLE
 Biodiversity Net Gain
 Baseline Habitats -
 Watercourse & Hedgerow
 References - Sheet 7

SHEET NUMBER
 Figure 2



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ANNEX A: SUMMARY OF BASELINE AND POST DEVELOPMENT HABITAT CONDITION

Table A.1: Baseline Condition of Semi-Natural Habitats

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
Arable – cereal crops	All parcels	N/A	Default score
Artificial unvegetated	All parcels	N/A	Default score
Bramble scrub	All parcels	Poor	Default score
Canal	Stainforth and Keadby Canal	Poor	Output from MoRPh assessment
Ditches	6-11 and 21	Poor	<ul style="list-style-type: none"> - No signs of pollution (pass) - Aquatic flora rare and of low diversity (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Insufficient water levels and prone to drying (fail) - Shading <50% of length (pass) - No INNS (pass)
Ditches	1	Moderate	<ul style="list-style-type: none"> - No signs of pollution (pass) - A range of aquatic plants present (pass) - Duckweed and algae <10% cover (pass)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			<ul style="list-style-type: none"> - Marginal vegetation along >75% of length (pass) - No damage (pass) - Sufficient water levels (pass) - No shading (pass) - Elodea nuttallii abundant (fail)
Ditches	2	Poor	<ul style="list-style-type: none"> - No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail) - No INNS (pass)
Ditches	3	Poor	<ul style="list-style-type: none"> - No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			- No INNS (pass)
Ditches	4	Poor	<ul style="list-style-type: none"> - No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail) - No INNS (pass)
Ditches	5	Poor	<ul style="list-style-type: none"> - No signs of pollution (pass) - Aquatic flora (except Phragmites) rare and of low diversity due to shading (fail) - Algae >10% cover (fail) - Marginal vegetation along <75% of length (fail) - No damage (pass) - Sufficient water levels (pass) - Heavy shading along 50% of length (fail) - No INNS (pass)
Ditches	All other ditches	Moderate	- Reasonable assumption where ditches were not visited because they are located beyond the land required for construction.

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
Hawthorn scrub	All parcels	Poor	<ul style="list-style-type: none"> - >75% hawthorn (fail) - Uniform age structure (fail) - No INNS or undesirables (pass) - Poorly developed edge (fail) - No glades (fail)
Introduced shrub	All parcels	Poor	Default score
Mixed scrub	All parcels	Poor	<ul style="list-style-type: none"> - Some stands are not dominated by a single species, other stands >75% one species (pass, based on stands in best condition) - Uniform age structure (fail) - No INNS or undesirables (pass) - Poorly developed edge (fail) - No glades (fail)
Modified grassland	All parcels except the following	Poor	<ul style="list-style-type: none"> - Mean of <6 species per m² (fail) - Sward heigh uniform (fail) - Minimal scrub encroachment (pass) - No damage (pass) - No bare ground (fail) - No bracken (pass) - No Invasive Non-native Species (INNS)/ undesirables frequent (either white clover in sown grassland, or weeds in unmanaged grassland (fail)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			Reasonable assumption where parcels beyond the land required for construction was not visited.
Modified grassland	26, 27, 41, 42, 43 & 44	Moderate	<ul style="list-style-type: none"> - Mean of >6 species per m² (pass) - Sward height uniform (fail) - Scrub encroachment <20% (pass) - No damage (pass) - No bare ground (fail) - No bracken (pass) - No Invasive Non-native Species (INNS)/ undesirables at low cover (pass)
Native hedgerow associated with bank or ditch	All parcels	Good	Unaffected mature hedgerows adjacent to existing AIL route constructed for Keadby 2 Power Station. Not relevant to Proposed Development so not surveyed. Assume Good condition.
Native hedgerow with trees	All parcels	Moderate	Unaffected existing hedgerow. Fails on height (criteria A1 - <1.5m tall) and width (A2 - <1.5m width).
Native species rich hedgerow	All parcels	Poor	Unaffected young planting still in tree tubes next to permanent access route off A18. Mixed native species. Fails criteria A1 (<1.5m tall), A2 (<1.5m wide), B1 (as still in tubes), B2 (still very gappy, shrubs yet to merge), C1 (road verge regularly mown).
OMH	All parcels	Fairly Poor	<ul style="list-style-type: none"> - Uniform structure (fail) - Moderate herb diversity but limited flower resource (midpoint between pass/fail)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			<ul style="list-style-type: none"> - INNS rare (pass) - Spatial variation not consistent with formal definition of OMH (fail) <p>Existing disturbed ground coinciding with access route for vehicles into ash tip. Nominally (given connected), but trivial, part of OMH in main ash tip. Some botanical interest but value limited by use for access. Contributes negligibly to the invertebrate interest of the main ash tip, substrates compacted. Scored as Fairly Poor based on above and professional judgement.</p>
Other neutral grassland	All parcels	Poor	<ul style="list-style-type: none"> - Appearance typical (pass) - Sward height uniform (fail) - No bare ground (fail) - No bracken but scrub >5% cover (fail) - No INNS and undesirables at low cover (pass)
Other rivers and streams	Hatfield Waste Drain	Moderate	Output from MoRPh assessment
Other woodland, broadleaved	All parcels	Moderate	<ul style="list-style-type: none"> - 1 age class (1 point) - No browsing damage (3 points) - No INNS (3 points) - >4 native species (3 points) - Native woodland (3 points)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			<ul style="list-style-type: none"> - No open space (1 point) - Some regeneration (2 points) - No disease seen (3 points) - Secondary woodland so not good example of NVC type (1 point) - One storey (1 point) - No veterans (1 point) - Minimal deadwood (1 point) - No enrichment (3 points)
Ruderal/ ephemeral	All parcels	Poor	<ul style="list-style-type: none"> - Not a good match for a named vegetation type (fail) - No significant tree cover (pass) - Largely comprised of weed species (fail) - Vegetation at least 5% (pass)
Wet woodland	All parcels	Moderate	<ul style="list-style-type: none"> - 2 age classes (2 points) - No browsing damage (3 points) - No INNS (3 points) - 3-4 native species (2 points) - Native woodland (3 points) - No open space (1 point) - Some regeneration (2 points) - No disease seen (3 points)

Habitat	ID	Baseline condition	Reason/ evidence for the assigned condition
			<ul style="list-style-type: none"> - Secondary woodland so not good example of NVC type (1 point) - One storey (1 point) - No veterans (1 point) - Minimal deadwood (1 point) - No enrichment (3 points)

Table A.2: Post Development Condition of New/Enhanced Habitats

Habitat	ID	Proposed condition	Reason for the assigned condition
Canal	Stainforth and Keadby Canal	Fairly Good	Proposed marginal vegetation increases vegetation structure and naturalness of the canal from a very low baseline. For purposes of MoRPh assessment this is sufficient to raise the condition from Poor.
Ditches	Ditches 2, 3, 5	Moderate	<ul style="list-style-type: none"> - Proposed Development will not pollute the ditch (pass) - Dredging to be undertaken to reduce dominance of reeds and to create open water likely to promote aquatic flora. Additional benefit from reduction in shading (pass) - Baseline algae/ duckweed >10% cover and no certainty of improvement (fail) - Proposed reduction in shading likely to promote marginal vegetation and permit occupancy along >75% of length (pass)

Habitat	ID	Proposed condition	Reason for the assigned condition
			<ul style="list-style-type: none"> - Proposed Development will not damage the ditch (pass) - Sufficient water levels, with improvement as a result of the proposed dredging (pass) - Management proposed to reduce shading to <50% of length (pass) - No INNS likely to colonise as a consequence of Proposed Development (pass)
Mixed scrub	C6, C7	Moderate	<ul style="list-style-type: none"> - Species-rich plantings proposed so that no one species dominates (pass) - Planting stock will have a uniform age structure (fail) - No INNS or undesirables likely with proposed management (pass) - Adjacent habitats also to be enhanced, so able to create ecotones; also adjacent to watercourse, another ecotone (pass) - No glades feasible in scrub stand of the proposed size (fail)
Native species rich hedgerow	As shown on post development plan	Poor	Condition likely to be Moderate within 5 years but this is not overstated for purposes of the assessment as requirements to maintain an oversail for large deliveries to the existing wind farm may limit the height of the new hedgerow. Therefore the minimum commitment is to achieve a hedgerow comparable to that already present.
Other neutral grassland	C3, C4, C5	Moderate	Habitat creation and aftercare to achieve:

Habitat	ID	Proposed condition	Reason for the assigned condition
			<ul style="list-style-type: none"> - Proposed seed mixture will result in grassland of native composition and good botanical diversity (pass) - Mowing regimes proposed to achieve sward structural diversity (pass) - Ability to achieve and maintain small scale bare ground uncertain (fail) - Scrub/ bracken to be maintained at optimal level (pass) - INNS and undesirables to be controlled (pass)
Other rivers and streams	Hatfield Waste Drain	Fairly Good	Proposed scrub planting beneficially increases vegetation structure in riparian zone. For purposes of MoRPh assessment this is sufficient to raise the condition from Moderate.
Sustainable Urban Drainage feature	C2	Fairly Poor	<p>No clear guidance on assessment parameters. However, any standing water can expect to be colonised by aquatic flora and fauna. Based on the pond criteria:</p> <ul style="list-style-type: none"> - Fed by surface water run-off so water quality likely to be reasonable (pass) - To be surrounded by semi-natural grassland (pass) - Not possible to assume absence of algae/duckweed (fail) - Standalone water body (pass) - Design can allow for fluctuating water levels (pass) - Aim would be to prevent introduction of INNS (pass) - No fish stocking proposed (pass)

Habitat	ID	Proposed condition	Reason for the assigned condition
			<ul style="list-style-type: none"> - Preference is a concrete liner so only structurally simple vegetation likely to establish (fail) - Unshaded by trees/scrub (pass) Moderate condition feasible but assume fairly poor given pond yet to be designed.

ANNEX B: SUMMARY OF DATA ENTERED INTO AND RESULTS OF THE METRIC 3.0 WORKBOOK

A summary of the assessment is provided below. The Metric 3.0 Excel workbook will be provided to relevant stakeholders on request.

Keadby 3 Carbon Capture Power Station		Return to results menu	
Headline Results			
On-site baseline	Habitat units	92.57	
	Hedgerow units	6.98	
	River units	26.51	
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	102.01	
	Hedgerow units	8.90	
	River units	26.99	
On-site net % change (Including habitat retention, creation & enhancement)	Habitat units	10.19%	
	Hedgerow units	27.58%	
	River units	1.80%	
Off-site baseline	Habitat units	0.00	
	Hedgerow units	0.00	
	River units	0.00	
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00	
	Hedgerow units	0.00	
	River units	0.00	
Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	9.43	
	Hedgerow units	1.92	
	River units	0.48	
Total on-site net % change plus off-site surplus (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	10.19%	
	Hedgerow units	27.58%	
	River units	1.80%	
Trading rules Satisfied?	No - Check Trading Summary		

Trading Summary		
Distinctiveness Group	Trading Rule	Trading Satisfied?
Very High	Bespoke compensation likely to be required	Yes
High	Same habitat required	No
Medium	Same broad habitat or a higher distinctiveness habitat required	Yes
Low	Same distinctiveness or better habitat required	Yes

Keadby 3 Carbon Capture Power Station																
A-1 Site Habitat Baseline																
Condense / Show Columns																
Condense / Show Rows																
Main Menu																
Instructions																
Ref	Habitats and areas			Distinctiveness	Condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline Total habitat units	Retention category biodiversity value						Bespoke compensation agreed for unacceptable losses	Comments
	Broad habitat	Habitat type	Area (hectares)	Distinctiveness	Condition	Strategic significance			Area retained	Area enhanced	Baseline units	Baseline units enhanced	Area lost	Units lost		
1	Grassland	Modified grassland	8.21	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	16.42			0.00	0.00	8.21	16.42		PCC Site - Keadby Common, Parcel 46
2	Grassland	Modified grassland	0.62	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	124			0.00	0.00	0.62	124		PCC Site - Keadby Common, Parcel 67
3	Urban	Artificial unvegetated, unsealed surface	4.58	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Compensation Not Required	0.00			0.00	0.00	4.58	0.00		PCC Site - Keadby 2 Soil Storage Area, Parcel 151 & 152.
4	Urban	Developed land; sealed surface	0.52	V.Low	N/A - Other	Within area formally identified in local strategy	Compensation Not Required	0.00		0.52	0.00	0.00	0.00	0.00		Car park by North Pillfreg Bridge, to be broken out and reseeded, Parcel 82 (part).
5	Woodland and forest	Wet woodland	0.06	High	Moderate	Within area formally identified in local strategy	Same habitat required	0.83	0.06		0.83	0.00	0.00	0.00		PCC Site - Retained scrub habitat connecting to adjacent wet woodland and treated as such.
6	Grassland	Modified grassland	1.73	Low	Moderate	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	6.92	0.91		3.64	0.00	0.82	3.28		PCC Site - Powerline wayleave, Parcel 26, 27, 41, 42, 43 & 44
7	Heathland and shrub	Hawthorn scrub	0.29	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	1.16	0.15		0.60	0.00	0.14	0.56		PCC Site - Dense hawthorn scrub, Parcel 21, 22 & 23
8	Urban	Open Mosaic Habitats on Previously Developed Land	0.26	High	Fairly Poor	Within area formally identified in local strategy	Same habitat required	2.69	0.01		0.10	0.00	0.25	2.59		PCC Site - Existing disturbed ground coinciding with access route for vehicles into ash tip. Nominally (given connected), but trivial, part of DMH in main ash tip. Some botanical interest but value limited by use for access. Contributes negligibly to the invertebrate interest of the main ash tip, substrates compacted, Parcel 102 & 106.
9	Heathland and shrub	Mixed scrub	0.09	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.36			0.00	0.00	0.09	0.36		PCC Site - Dense scrub adjacent to K2 car park. Diverse, but dense with even age structure. No glades or clearings, no tall herb fringe (straight into ephemeral), Parcel 16.
10	Heathland and shrub	Hawthorn scrub	0.31	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	124	0.22		0.88	0.00	0.09	0.36		PCC Site - Location of electrical connection, Parcel 24
11	Grassland	Modified grassland	5.49	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	12.63	2.29	0.6	5.27	1.38	2.60	5.98		Grassland along permanent access road. Habitat creation area (excluding area to be converted to scrub see line 20), 2.6ha required for construction laydown (Area 2c on Construction Laydown Area Plan), Parcel 52.
12	Grassland	Modified grassland	0.22	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.51			0.00	0.00	0.22	0.51		A18 widening - assume worst case (all verge in red line on north side of carriageway). Species-poor grassland affected by highways regimes, Parcel 71, 72, 73
13	Cropland	Cereal crops	10.43	Low	N/A - Agricultural	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	20.86			0.00	0.00	10.43	20.86		Arable fields being used for laydown next to North Pillfreg Bridge, Parcel 89
14	Cropland	Cereal crops	1.5	Low	N/A - Agricultural	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	3.00	1.5		3.00	0.00	0.00	0.00		Other arable farmland unaffected by development, Parcels 87, 88, 90-93
15	Heathland and shrub	Bramble scrub	0.04	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.16	0.04		0.16	0.00	0.00	0.00		Retained, Parcel 25. Default condition is Poor.
16	Grassland	Other neutral grassland	1.48	Medium	Poor	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	5.92	1.48		5.92	0.00	0.00	0.00		Retained, Parcel 29
17	Urban	Introduced shrub	0.03	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.07	0.03		0.07	0.00	0.00	0.00		Ornamental planting unaffected by development.

18	Sparsely vegetated land	Ruderal/Ephemeral	0.32	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.74	0.32		0.74	0.00	0.00	0.00	Weedy vegetation established in ruderal/disturbed settings. Not affected by development.
19	Urban	Developed land; sealed surface	25.59	V.Low	N/A - Other	Area/compensation not in local strategy/ no local strategy	Compensation Not Required	0.00	25.59		0.00	0.00	0.00	0.00	Existing hardstanding and buildings.
20	Grassland	Modified grassland	0.3	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	0.60		0.3	0.00	0.60	0.00	0.00	Grassland along permanent access road to be converted to scrub.
21	Heathland and shrub	Bramble scrub	0.17	Medium	Poor	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	0.78	0.17		0.78	0.00	0.00	0.00	Existing scrub by canal. Not affected by development.
22	Heathland and shrub	Mixed scrub	0.1	Medium	Poor	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	0.46	0.1		0.46	0.00	0.00	0.00	Various locations, not affected by development.
23	Heathland and shrub	Hawthorn scrub	0.02	Medium	Poor	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	0.09	0.02		0.09	0.00	0.00	0.00	By Trent Road, not affected by development.
24	Grassland	Modified grassland	0.08	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.18	0.08		0.18	0.00	0.00	0.00	Retained. Parcel 154, 160
25	Grassland	Modified grassland	0.16	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.37			0.00	0.00	0.16	0.37	PCC Site - Keadby Common. Parcel 66
26	Grassland	Modified grassland	0.41	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	0.94			0.00	0.00	0.41	0.94	PCC Site - Keadby Common. Parcel 69, 40
27	Grassland	Modified grassland	0.99	Low	Poor	Area/compensation not in local strategy/ no local strategy	Same distinctiveness or better habitat required	1.98	0.99		1.98	0.00	0.00	0.00	Various locations, not affected by development.
28	Grassland	Modified grassland	3.13	Low	Poor	Within area formally identified in local strategy	Same distinctiveness or better habitat required	7.20	3.13		7.20	0.00	0.00	0.00	Various locations, not affected by development.
29	Woodland and forest	Other woodland; broadleaved	0.54	Medium	Moderate	Within area formally identified in local strategy	Same broad habitat or a higher distinctiveness habitat required	4.97	0.54		4.97	0.00	0.00	0.00	Plantations by Chapel Lane and Trent Road. Retained.
30	Urban	Urban Tree	0.0326	Medium	Moderate	Area/compensation not in local strategy/ no local strategy	Same broad habitat or a higher distinctiveness habitat required	0.26	0.0326		0.26	0.00	0.00	0.00	8 semi-mature mainly native trees by Trent Road. Retained. Age precludes Good condition.
			67.67					92.57	37.66	1.42	37.13	1.98	28.62	53.46	

B-1 Site Hedge Baseline																
Condense / Show Columns Condense / Show Rows																
Main Menu Instructions																
UK Habitats - existing habitats				Habitat distinctiveness	Habitat condition	Strategic significance	Suggested action to address habitat losses	Ecological baseline	Retention category biodiversity value						Comments	
Baseline ref	Hedge number	Hedgerow type	Length KM	Distinctiveness	Condition	Strategic significance		Total hedgerow units	Length retained	Length enhanced	Units retained	Units enhanced	Length lost	Units lost	Assessor comments	Reviewer comments
1		Native Hedgerow - Associated with bank or ditch	0.039	Medium	Good	Within area formally identified in local strategy	Like for like or better	0.54	0.039		0.54	0.00	0.00	0.00	Unaffected hedgerows adjacent to existing A11 route constructed for Keadby 2 Power Station. Not relevant to Proposed Development assume Good condition.	
2		Native Hedgerow with trees	0.25	Medium	Moderate	Within area formally identified in local strategy	Like for like or better	2.30	0.25		2.30	0.00	0.00	0.00	Unaffected existing hedgerow adjacent to Trent Road. Fails on height (criteria A1 - <1.5m tall) and width (A2 - <1.5m width).	
3		Native Species Rich Hedgerow	0.9	Medium	Poor	Within area formally identified in local strategy	Like for like or better	4.14	0.9		4.14	0.00	0.00	0.00	Unaffected young planting still in tree tubes next to permanent access route off A18. Mixed native species. Fails criteria A1 (<1.5m tall), A2 (<1.5m wide), B1 (as still in tubes), B2 (still very gappy, shrubs yet to merge), C1 (road verge regularly mown).	
4																
5																
6																
7																
8																
			1.19					6.98	1.19	0.00	6.98	0.00	0.00	0.00		

B-2 Site Hedge Creation													
Condense / Show Columns Condense / Show Rows													
Main Menu Instructions													
Proposed habitats				Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier			Difficulty risk multipliers	Hedge units delivered	Comments	
Baseline ref	New hedge number	Habitat type	Length km	Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation		Assessor comments	Reviewer comments	
1		Native Species Rich Hedgerow	0.5	Medium	Poor	Within area formally identified in local strategy	Check details- Delay in starting habitat in required condition?	5	Low	1.92	Extension to existing hedgerow adjacent to permanent access route off A18. Condition likely to be Moderate within 5 years but this is not overstated for purposes of the assessment as requirements to maintain an oversail for large deliveries to the existing wind farm may limit the height of the new hedgerow. Therefore the minimum commitment is to achieve a hedgerow comparable to that already present.		
2													
3													
4													
5													
6													
			0.50							1.92			

C-1 Site River Baseline														Retention category biodiversity value						Co	
Existing river type		Habitat distinctiveness		Habitat condition	Strategic significance			Watercourse encroachment		Riparian encroachment		Suggested action	Ecological baseline	Retention category biodiversity value						Assessor Comments	
Baseline ref	River type	Length KM	Distinctiveness	Condition	Strategic significance	Strategic significance	Strategic position multiplier	Extent of encroachment	Multiplier	Extent of encroachment	Multiplier		Total river units	Length retained	Length enhanced	Units retained	Units enhanced	Length Lost	Units Lost		
1	Canals	0.145	Medium	Poor	Within Local Plans	High strategic significance	1.15	Minor	0.8	Major	0.75	Restore	0.40	0	0.132	0.00	0.36	0.01	0.04	Stainforth and Keadby Canal - Section affected by intake structure within channel: 13.25m = 0.013km. Extends 3m out into watercourse = 34.5m wide, therefore minor watercourse encroachment. No riparian encroachment as the development occupies existing built footprint.	
2	Other Rivers and Streams	0.313	High	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	Major	0.75	Restore	3.24	0.102	0.075	1.06	0.78	0.14	1.41	Hatfield Waste Drain - Existing bridge represents major encroachment in riparian zone. The bridge will be replaced but with a minor (2m) increase in width. Extent of earthworks for Highway improvements (4.6 Highway Works Plan) is 136m = 0.136km.	
3	Ditches	0.476	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	4.38	0.461	0	4.24	0.00	0.02	0.14	PCC Site Drain 1 - Glew Drain. 15m bank top habitat loss for emergency access bridge = 0.015km.	
4	Ditches	0.418	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.92	0	0.418	0.00	1.92	0.00	0.00	PCC Site Drain 2	
5	Ditches	0.284	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.31	0	0.284	0.00	1.31	0.00	0.00	PCC Site Drain 3	
6	Ditches	0.379	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.74	0	0	0.00	0.00	0.38	1.74	PCC Site Drain 4	
7	Culvert	0.037	Low	Poor	Low potential/action not identified	Low Strategic significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.07	0.037	0	0.07	0.00	0.00	0.00	PCC Site Drain 4 - existing culvert	
8	Ditches	0.087	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.40	0	0.087	0.00	0.40	0.00	0.00	PCC Site Drain 5	
9	Culvert	0.005	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.01	0.005	0	0.01	0.00	0.00	0.00	PCC Site Drain 2 - existing culvert	
10																				Drain 6 - removed from Metric (does not exist)	
11																				Drain 6 - existing culvert - removed from Metric (does not exist)	
12	Ditches	0.067	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.31	0.067	0	0.31	0.00	0.00	0.00	0.00	Drain 7
13																					Drain 8 - deleted from Metric (no longer exists)
14	Ditches	0.154	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.71	0.154	0	0.71	0.00	0.00	0.00	0.00	Drain 9
15	Culvert	0.041	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.08	0.041	0	0.08	0.00	0.00	0.00	0.00	Drain 9 - existing culvert
16	Ditches	0.308	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.42	0.308	0	1.42	0.00	0.00	0.00	0.00	Drain 10
17	Culvert	0.05	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.10	0.05	0	0.10	0.00	0.00	0.00	0.00	Drain 10 - existing culvert

C-1 Site River Baseline														Retention category biodiversity value						Co
Existing river type			Habitat distinctiveness	Habitat condition	Strategic significance			Watercourse encroachment		Riparian encroachment		Suggested action	Ecological baseline	Length retained	Length enhanced	Units retained	Units enhanced	Length Lost	Units Lost	Assessor Comments
Baseline ref	River type	Length KM	Distinctiveness	Condition	Strategic significance	Strategic significance	Strategic position multiplier	Extent of encroachment	Multiplier	Extent of encroachment	Multiplier		Total river units							
18	Ditches	0.26	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.20	0.26	0	1.20	0.00	0.00	0.00	Drain 11
19	Culvert	0.011	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.02	0.011	0	0.02	0.00	0.00	0.00	Drain 11 - existing culvert
20	Ditches	0.547	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	5.03	0.547	0	5.03	0.00	0.00	0.00	Drain 12
21	Culvert	0.013	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.03	0.013	0	0.03	0.00	0.00	0.00	Drain 12 - existing culvert
22	Ditches	0.051	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.47	0.051	0	0.47	0.00	0.00	0.00	Drain 13
23	Ditches	0.012	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.11	0.012	0	0.11	0.00	0.00	0.00	Drain 14
24	Culvert	0.014	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.03	0.014	0	0.03	0.00	0.00	0.00	Drain 14 - existing culvert
25	Ditches	0.014	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.13	0.014	0	0.13	0.00	0.00	0.00	Drain 15
26	Culvert	0.017	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.03	0.017	0	0.03	0.00	0.00	0.00	Drain 15 - existing culvert
27	Ditches	0.025	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.23	0.025	0	0.23	0.00	0.00	0.00	Drain 16
28	Ditches	0.025	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.23	0.025	0	0.23	0.00	0.00	0.00	Drain 17
29	Ditches	0.02	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.18	0.02	0	0.18	0.00	0.00	0.00	Drain 18
30	Ditches	0.009	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.08	0.009	0	0.08	0.00	0.00	0.00	Drain 19
31	Culvert	0.008	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.02	0.008	0	0.02	0.00	0.00	0.00	Drain 19 - existing culvert
32	Ditches	0.063	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.58	0.063	0	0.58	0.00	0.00	0.00	Drain 20
33	Ditches	0.39	Medium	Poor	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	1.73	0.39	0	1.73	0.00	0.00	0.00	Drain 21
34	Culvert	0.045	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.09	0.045	0	0.09	0.00	0.00	0.00	Drain 21 - existing culvert
35	Ditches	0.016	Medium	Moderate	Within Local Plans	High strategic significance	1.15	No Encroachment	1	No Encroachment	1	Restore	0.15	0.016	0	0.15	0.00	0.00	0.00	Drain 22
36	Culvert	0.011	Low	Poor	Low potential/action not identified in any plan	Low Strategic Significance	1	N/A - Culvert	1	No Encroachment	1	Restore	0.02	0.011	0	0.02	0.00	0.00	0.00	Drain 22 - existing culvert
37																				
38																				
39																				
40																				
41																				
		4.32											26.51	2.78	1.00	18.42	4.77	0.54	3.32	

C-2 Site River Creation													
Condense / Show Columns		Condense / Show Rows		Main Menu		Instructions							
Baseline ref	Proposed habitats		Habitat distinctiveness	Habitat condition	Strategic significance	Temporal multiplier		Difficulty multipliers	Watercourse encroachment	Riparian encroachment	River units delivered	Comments	
	River type	Length km	Distinctiveness	Condition	Strategic significance	Standard or adjusted time to target condition	Final time to target condition/years	Final difficulty of creation	Extent of encroachment	Extent of encroachment		Assessor comments	Reviewer comments
1	Canals	0.013	Medium	Poor	Delivery within Local Plans	Standard time to target condition applied	1	Low	Minor	Major	0.03	Stainforth and Keadby Canal. While there is an impact from the Proposed Development within the channel there is no loss of watercourse length and the impact is very small scale and therefore it will not materially alter the existing baseline condition and encroachment.	
2	Other Rivers and Streams	0.136	High	Moderate	Delivery within Local Plans	Standard time to target condition applied	5	High	No Encroachment	Major	0.39	Hatfield Waste Drain - replacement of bridge 14.6m wide, therefore 2m increase in width relative to the current bridge. Does not meet definition of encroachment in guidance, but location of impact requires major impact to be recorded even though very small scale.	
3	Ditches	0.015	Medium	Moderate	Delivery within Local Plans	Standard time to target condition applied	5	Low	No Encroachment	No Encroachment	0.12	Drain 1 (Glew Drain). As the works are very small scale there are no implications for nature conservation value, function or integrity of the drain. Therefore the works are insufficient to materially alter the condition of the drain in terms of the site condition assessment criteria.	
4													
5													
6													
7													
8		0.16									0.54		

