KEADBY 3
CARBON CAPTURE
POWER STATION

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

**Document Ref: 7.1**

**Planning Inspectorate Ref: EN010114**

**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**

# Framework Construction Environmental Management Plan (CEMP)

**The Planning Act 2008**

**Applicant: Keadby Generation Limited**

**Date: ~~May 2021~~April 2022**

## DOCUMENT HISTORY

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|---|---|
| **Document Ref** | 7.1/Framework Construction Environmental Management Plan |
| **Revision** | VP~~1.1~~32.0 |
| **Document Owner** | AECOM |

## 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. |
| ALC | Agricultural Land Classification - part of the planning system in England and Wales which classifies agricultural land into five categories according to versatility and suitability for growing crops. |
| BAT | Best Available Techniques – available techniques which are the best for preventing or minimising emissions and impacts on the environment. BAT is required for operations involving the installation of a facility that carries out industrial processes. Techniques can include both the technology used and the way an installation is designed, built, maintained, operated and decommissioned. |
| BMV | Best and most versatile. |
| BPEO | Best Practicable Environmental Option - the BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits, as a whole, at acceptable cost, in both the short-term and the long-term. |
| BPM | Best Practicable Means – Actions undertaken, and mitigation measures implemented to ensure that noise levels are minimised to be as low as practicable. |
| British Standard | Standard produced by the British Standards Institution based upon the principles of standardisation recognised inter alia in European Policy. |
| CCGT | Combined Cycle Gas Turbine - a CCGT is a combustion plant where a gas turbine is used to generate electricity and the waste heat from the flue-gas of the gas turbine is converted to useful energy in a heat recovery steam generator (HRSG), where it is |

| Abbreviation | Description |
|---|---|
| | used to generate steam. The steam then expands in a steam turbine to produce additional electricity. |
| CCP | Carbon Capture Plant - plant used to capture carbon dioxide ($CO_2$) emissions produced from the use of fossil fuels in electricity generation and industrial processes. |
| CCR | Carbon Capture Ready - space to be set aside to accommodate future carbon capture equipment. |
| CCS | The Considerate Constructors Scheme – a non-profit making, independent organisation founded in 1997 by the construction industry to improve its image. The scheme promotes good construction site practice and provides codes of considerate practice which commit the users of registered sites to be considerate and good neighbours, respectful; environmentally conscious, responsible and accountable. |
| 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). |
| CD&E | Construction, Demolition and Excavation Waste. |
| 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. |
| CIRIA | Construction Industry Research and Information Association - a member-based research and information organisation dedicated to improvement in all aspects of the construction industry. |
| COSHH | Control of Substances Hazardous to Health - a United Kingdom Statutory Instrument stating general requirements on employers to protect employees and other persons from the hazards of substances used at work by risk assessment. |
| CoW | Clerk of Works |
| CTMP | Construction Traffic Management Plan - a plan outlining measures to organise and control vehicular movement on a construction site so that vehicles and pedestrians using site routes can move around safely. |
| CWTP | Construction Workers Travel Plan - a plan managing and promoting how construction workers travel to a particular area or organisation. It aims at promoting greener, cleaner travel choices and reducing reliance on the private car. |

| Abbreviation | Description |
|---|---|
| DCLG | Department of Communities and Local Government (now the Ministry of Housing, Communities and Local Government) – the UK department for communities and local government in England. |
| 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 – the UK government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom. The department's priorities are to grow the rural economy, improve the environment and safeguard animal and plant health. |
| DML | Deemed Marine Licence – licence provided by the Marine Management Organisation, granted as part of a DCO. |
| EA | Environment Agency - a non-departmental public body sponsored by the United Kingdom government's Department for Environment, Food and Rural Affairs (DEFRA), with responsibilities relating to the protection and enhancement of the environment in England. |
| EIA | Environmental Impact Assessment - a term used for the statutory process that assesses environmental consequences (positive or negative) of a project prior to the decision to move forward with the proposed development. The EIA process concludes whether likely significant effects on the environment are expected. |
| ELVs | Emission Limit Values - emission limit values based on the Best Available Techniques. |
| EMS | Environment Management System - the management of an organization's environmental programs in a comprehensive, systematic, planned and documented manner. |
| EPC | Engineering, Procurement and Construction (EPC) contractor |
| ES | Environmental Statement - a report in which the process and results of an Environment Impact Assessment are documented. |
| GPP | Guidance for Pollution Prevention - provides updated good practice guidance to the UK. |
| HE | Highways England - operate, maintain and improve England's motorways and major A-roads. |
| HEMP | Handover Environmental Management Plan |
| HGV | Heavy Goods Vehicle - vehicles with a gross weight in excess of 3.5 tonnes. |

| Abbreviation | Description |
|---|---|
| HP | High pressure. |
| HRSG | Heat Recovery Steam Generator - an energy recovery heat exchanger that recovers heat from a hot gas stream. It produces steam that can be used in a process (cogeneration) or used to drive a steam turbine (combined cycle). |
| ICCI | In-Combination Climate Change Impact - the in-combination effects of a changing climate. |
| IDB | Internal Drainage Boards - a type of operating authority with permissive powers to undertake work to secure clean water drainage and water level management within drainage districts. |
| 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. |
| IoAaNNWLMB | Isle of Axholme and North Nottinghamshire Water Level Management Board |
| ISMP | Invasive Species Management Plan - preventing and managing the spread of invasive species and their potential impacts. |
| JNCC | The Joint Nature Conservation Commission - the public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation. |
| KPI | Key Performance Indicators |
| LBMEP | Landscaping and Biodiversity Management and Enhancement Plan |
| LLFA | Lead Local Flood Authority - flood risk management body. |
| LMP | Light Management Plan - accompanies the detailed Construction Environmental Management Plan (CEMP) which sets out the approach for use of lighting during the construction phase. |
| LWS | Local Wildlife Site - an area important for the conservation of wildlife, these are non-statutory sites of nature conservation value that have been designated 'locally'. These sites are referred to differently between counties with common terms including site of importance for nature conservation, county wildlife site, site of biological importance, site of local importance and sites of metropolitan importance. |
| MMO | Marine Management Organisation - an executive, non-departmental body in the United Kingdom with the responsibility of licencing, regulating and planning marine activities in the seas around England so that they are carried out in a sustainable way. |
| MMP | Materials Management Plan - A mechanism by which those who are developing a site can comply with Environment Agency regulations for excavated ground materials. |

| Abbreviation | Description |
|---|---|
| NJUG | National Joint Utilities Group - a trade association which represents utilities and their contractors. |
| NLC | North Lincolnshire Council |
| NPPF | 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 February 2019.<br>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'. |
| NPPW | National Planning Policy for Waste - sets out the government's detailed waste planning policies. |
| NSIP | Nationally Significant Infrastructure Projects - defined by the Planning Act 2008 and covers projects relating to energy (including generating stations, electric lines and pipelines); 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. |
| OWSI | Outline Written Scheme of Archaeological Investigation |
| PCC | Power and Carbon Capture |
| PPE | Personal Protective Equipment. |
| PPG | Pollution Prevention Guidance - provide advice on the management of construction to avoid, minimise and reduce environmental impacts. |
| PWMS | Precautionary Working Method Statement. |
| SEA/ SA | Strategic Environmental Assessment/Sustainability Appraisal - SA is designed to ensure compliance with SEA and as such includes for requirements on environmental decision making such as an opportunity for the public to express their opinion on draft plans (community involvement), take into account significant environmental effects including those on human health, material assets and climatic factors and a full assessment of alternative options and reasons why alternatives have been assessed and why others have not. |
| SOAEL | Significant Observed Adverse Effect Level - the level above which significant adverse effects on health and quality of life occur. |

| Abbreviation | Description |
|---|---|
| SuDS | Sustainable Urban Drainage Systems |
| SWMP | Site Waste Management Plan - a plan setting out how resources will be managed, and waste controlled at all stages during a construction project. |
| TTRO | Temporary Traffic Regulation Order - allows a local authority to regulate traffic for temporary periods by order or notice. |
| WAC | Waste Acceptance Criteria - guidance on acceptance procedures and criteria for wastes destined for disposal in landfills. |
| WFD | Water Framework Directive - European Union directive which commits member states to achieve good qualitative and quantitative status of all water bodies. |
| WMP | Water Management Plan |
| 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. |

# CONTENTS



# ANNEXES



# TABLES

# EXECUTIVE SUMMARY

1 This document has been prepared on behalf of Keadby Generation Ltd (the Applicant) to provide a framework for a Construction Environmental Management Plan (CEMP). The final CEMP will be produced by the contractor appointed by the Applicant to undertake the construction of the Proposed Development. By drawing upon the measures set out in the following sections, the final CEMP will help to manage environmental issues appropriately during construction.

2 **Section 1** provides an overview of the Proposed Development, the Applicant and a description of the Proposed Development Site.

3 **Section 2** details the indicative construction programme, including construction facilities, delivery routes for construction materials, construction lighting and recycling and disposal measures for construction waste.

4 **Section 3** gives an indication of the additional information which should be included under each sub-section within the final CEMP. This includes a table summarising the potential impacts for each environmental topic (Air Quality, Traffic and Transport, Noise and Vibration, Ecology, Landscape and Visual Amenity, Geology, Hydrogeology and Land Contamination, Flood Risk, Hydrology and Water Resources, Cultural Heritage, Waste, Socio-economics and Climate Change and Sustainability) reported in the Environmental Statement (ES) (**Application Document Ref. 6.2**). Mitigation and enhancement measures described in the ES to address construction impacts are also presented. Monitoring requirements for mitigation measures are described where these have been recommended in the ES and the responsibilities for implementation are to be confirmed in the final CEMP. Submission and approval of the final CEMP prior to commencement of construction is proposed to be secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).

5 **Appendix A** presents a Framework Site Waste Management Plan (SWMP). This outlines the waste management strategy for the construction phase by considering likely waste arisings from construction activities and provides recommended management measures, taking into account the principles of the waste hierarchy. A final SWMP would be developed by the appointed construction contractor.

6 **Appendix B** presents a Framework Soil Resources Plan which outlines the approach that will be implemented during the construction phase for the handling, movement and temporary storage of soils.

# 1.0 INTRODUCTION

## 1.1 Overview

1.1.1 This Framework Construction Environmental Management Plan (CEMP) (**Application Document Ref. 7.1**) 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, 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 construction) 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. 6.2**).

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[1] and Northern Endurance Partnership (NEP)[2] 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.

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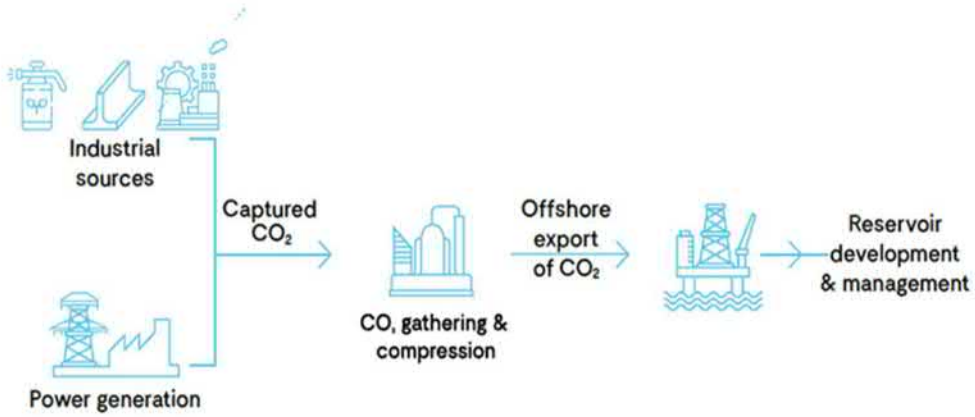



**Plate 1: Illustration of the Carbon Capture, Usage and Storage**

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 ZCH Partnership export pipeline and gathering network for onward transport to the Endurance saline aquifer 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 the

Schedule 1 of the draft DCO (**Application Document Ref. 2.1**) as Work No. 1 – 11 and shown on the Works Plans (**Application Document Ref. 4.3**).

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 the 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 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 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 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');

  - 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 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**);
- landscaping and biodiversity enhancement measures (**Work No. 11A**) and security fencing and boundary treatments (**Work No. 11B**); and
- 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. ZCH Partnership will be responsible for the construction, operation and decommissioning of the carbon dioxide gathering 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 applications by third parties, such as the Humber Low Carbon Pipeline DCO Project by National Grid Carbon[3].

1.4.7 The Proposed Development will operate 24 hours per day, 7 days per week with programmed offline periods for maintenance. It is anticipated that in the event of CCP maintenance outages, for example, it will 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.

1.4.8 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.

[3] https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/humber-low-carbon-pipelines/

1.5.3 The Proposed Development Site encompasses an area of approximately 69.4 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:

- Previously developed land, along with gas, towns water and other connections, and access routes, within the Keadby Power Station site;
- 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, the routes of which utilise an existing farm access track towards Chapel Lane and land within the existing Northern Powergrid substation on Chapel Lane;
- 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 crossing of the Hatfield Waste Drain lying west of Pilfrey 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 Development Consent Process

1.6.1 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).

1.6.2 An application for development consent for the Proposed Development has been submitted to the Planning Inspectorate (PINS) acting on behalf of the Secretary of State. 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 Secretary of State, who will then decide whether to make (grant) the DCO.

## 1.7 The Purpose and Structure of this Document

1.7.1 This Framework CEMP sets out a series of proposed measures that would be applied by the contractor to provide effective planning, management and control during construction to control potential impacts upon people, businesses and the natural and historic environment.

1.7.2 This Framework CEMP has been produced in conjunction with the ES (**Application Document Ref. 6.2**) with the aim of ensuring that design and impact avoidance measures reported in the ES are implemented and are effective, together with any additional mitigation measures proposed to reduce significant adverse effects. Site-specific controls, which will be included within the final CEMP, would be developed taking the measures set out in this Framework CEMP into account. The final CEMP will be developed in accordance with the principles set out in this Framework.

1.7.3 It is expected that the contractor will comply, as a minimum, with applicable environmental legislation at the time of construction, together with any additional environmental controls imposed by the DCO (**Application Document Ref. 2.1**). The final CEMP will, therefore, be designed with the objective of compliance with relevant environmental legislation and the mitigation measures set out within the ES and this Framework. Any additional construction licences, permits or approvals that are required would be listed in the final CEMP, including any environmental information submitted in respect of them.

1.7.4 Further guidance on specific areas, such as soil handling and dust management, are considered from industry best practice guidance documents, as set out in each discipline section of this Framework CEMP. The references to guidance documents are not intended to be exhaustive.

1.7.5 The final CEMP will broadly reflect the structure of this Framework CEMP, which is as follows:

- Section 2 provides an indication of the construction arrangements that have been assessed in the ES;
- Section 3 presents additional information that might be included under each sub-section within the final CEMP, which includes –
  - environmental impacts (assessed through the Environmental Impact Assessment (EIA)),
  - impact avoidance or reduction of measures to be applied, where the ES has assumed they would be applied during the detailed design or construction phase,
  - any other additional mitigation measures,
  - additional surveys or monitoring considered necessary pre-construction or during construction in order to confirm the status of receptors, and the effectiveness of impact avoidance/mitigation measures,
  - corrective action procedure to be applied, where necessary, and
  - links to other complementary plans and procedures;
- **Appendix A** comprises a Framework Site Waste Management Plan (SWMP)'
- **Appendix B** comprises a Framework Soil Resources Plan (SRP);
- **Appendix C** comprises Haul Road Ecology Protection Measures relevant to the restoration of the Additional Abnormal Indivisible Load (AIL) restoration; and
- **Appendix D** comprises the Haul Road Construction Environmental Management Plan; relevant to the restoration of the Additional Abnormal Indivisible Load (AIL) restoration.

1.7.6 In summary, the final CEMP will identify how commitments made during the EIA (and reported in the ES) will be translated into actions on-site.

1.7.7 The contractor will be responsible for working in accordance with the environmental controls documented in the final CEMP, which will allocate responsibilities for environmental performance. The overall responsibility for implementation of the final CEMP will lie with the Applicant.

# 2.0 CONSTRUCTION PHASE ARRANGEMENTS

## 2.1 Indicative Programme

2.1.1 At this stage, a detailed construction programme is not available, as this is normally determined by the Engineering, Procurement and Construction (EPC) contractor who has not yet been appointed. The Applicant would appoint one or more EPC contractors for the construction of the CCGT and CCP (**Work No 1**). Additional contractors are likely to be appointed to undertake the proposed minor highway and bridge replacement works (**Work No. 8**).

2.1.2 Construction of the Proposed Development could (subject to the necessary consents being granted and an investment decision being made) potentially start shortly after Quarter 4 2022 when it is anticipated the consent would be granted.

2.1.3 Due to uncertainties in the market and Government investment decisions in carbon capture and storage (CCS), the DCO Application is being made on the basis that commencement of development can take place for up to seven years from the granting of consent. For this reason, a scenario where construction commences later in the programme, up to 2029 (seven years after the DCO could be granted) has also been considered as a reasonable worst-case for some technical assessments.

2.1.4 An early works phase, including the A18 carriageway improvements and Mabey Bridge replacement, would be undertaken over a circa 6 month period. Construction activities for the main works phase are expected to be completed within approximately three years, followed by commissioning. Table 1 shows an indicative construction and commissioning programme.

**Table 1: Indicative construction and commissioning programme**

| | YEAR 1 | | | | YEAR 2 | | | | YEAR 3 | | | | YEAR 4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Early Works including A18 and Mabey Bridge Replacement | ■ | ■ | | | | | | | | | | | | | | |
| Site Enabling and Preparation | ■ | ■ | ■ | ■ | | | | | | | | | | | | |
| Groundworks | | | ■ | ■ | ■ | ■ | ■ | | | | | | | | | |
| Erection of main process equipment | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| Gas and electrical connection | | | | | | ■ | ■ | ■ | ■ | | | | | | | |
| Electrical and mechanical connections | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Above ground civil works | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Commissioning and testing | | | | | | | | | | | | | | ■ | ■ | ■ |

## 2.2 Working Hours

2.2.1 Core construction working hours would be Monday to Friday 07:00 to 19:00 (except bank holidays) and Saturday 08:00 to 13:00. However, it is likely that some construction activities may need to be undertaken outside these core working hours. This is principally because certain construction activities cannot be stopped, such as concrete pouring which would be agreed in advance with the local authority, works undertaken in response to an emergency, and non-noisy activities that may be undertaken at night. Twenty-four hour working for certain activities has therefore been assessed in **Chapter 9:** Noise and Vibration (ES Volume I – **Application Document Ref. 6.2**) which sets out specific mitigation and control measures required to prevent disturbance from any activities outside of core working hours. Requirements in the draft DCO (**Application Document Ref. 2.1**) secure the working hours and the approach to exceptions to the core working hours. Any such works will be minimised and will be carefully managed to reduce effects on the local community.

## 2.3 Traffic Management

2.3.1 During construction, the appointed contractor will ensure that the impacts from construction traffic on the local community (including local residents and businesses and users of the surrounding transport network) are minimised, where reasonably practicable, by implementing the measures set out in the Framework Construction Traffic Management Plan (CTMP) and the Framework Construction Workers' Travel Plan (CWTP) (**Application Document Ref. 7.2** and **Application Document Ref. 7.3** respectively); final plans will be secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).

2.3.2 Access to the Proposed Development Site during construction for both construction workers and HGV traffic will be via the existing access road from the A18. This access road is a purpose built road that serves the existing Keadby Windfarm and is used by all construction traffic for the Keadby 2 Power Station construction project. It is wide enough to allow access by construction traffic, without the need for alteration.

2.3.3 Construction staff are anticipated to travel to the Proposed Development Site via the existing trunk road and local networks. Construction staff arriving by car will use on-site parking, likely within the construction laydown Area 2 illustrated on **Figure 5.1** (ES Volume III - **Application Document Ref. 6.4**) and then use a park and ride system to transport the workers between Area 2 and the Proposed PCC Site (and other works areas) over North Pilfrey Bridge, via the existing internal access roads within Keadby Power Station (**Work 9B**).

2.3.4 HGV delivering construction materials will access the Proposed Development Site from the M180 Junction 2, via the A161 and A18, entering via the existing perpendicular access point off the A18 and over Mabey Bridge. Access into the Proposed Development Site will be controlled by a new gatehouse and HGV waiting area (refer to **Application Document Ref. 4.14**) where vehicle registration and deliveries will be recorded. At the junction of the M180, at this stage it is assumed that 80% would arrive/ depart to the west and 20% arrive/ depart to the east. The HGV routing plan is shown Plate 1 below. The location of the gatehouse has been set sufficiently back from the A18 to allow HGV to queue on the access road, rather than on the A18.

2.3.5 The volume of HGV associated with construction of the Proposed Development on the network is predicted to be at its maximum of 624 daily two-way vehicle movements (312 in and 312 out) for 2 months during the initial 6 month Site Enabling and Preparation phase of construction once Mabey Bridge has been replaced. This traffic is associated with the anticipated cut and fill of the top layer of ground within the Proposed PCC Site area to improve the geotechnical condition of the ground. The import and export of material will occur over a two-month period during Months 7 and 8 of the construction programme.

2.3.6 During the remainder of the construction period, HGV movements will vary with 120 two-way daily HGV movements (60 in and 60 out) from month 24 to month 35 of construction, 60 two-way daily HGV movements (30 in and 30 out) from

months 9 to 23 and months 36 to 42 of construction and 10 daily two-way HGV movements (5 in and 5 out) from months 1 to 6 of construction.

2.3.7 HGV arrivals, including deliveries, will be managed as far as reasonably practicable, such that they are spread evenly over the day between the hours of 07:00 and 19:00 Monday to Friday (except bank holidays) and 08:00 to 13:00 on Saturday (if required) to avoid on-site congestion. HGV deliveries would not be undertaken outside of core working hours, unless agreed with the local planning authority on a case by case basis.

2.3.8 Combining construction workforce vehicle movements with construction HGV movements over the entire construction programme shows the overall peak to occur in Months 26 and 27 when 1,236 two-way vehicle movements are anticipated (1,116 two-way car/ van movements and 120 two-way HGV movements per day). Further information on traffic volumes and routing is provided in **Appendix 10A:** Transport Assessment (ES Volume II – **Application Document Ref. 6.3**).

2.3.9 It may be necessary to construct new temporary access points into the laydown areas (Area 1 and Area 2 in **Figure 5.1** – ES Volume III **(Application Document Ref. 6.4**)) from this existing site access road. Existing farm crossings will be utilised and upgraded where this is reasonably practicable.

2.3.10 A number of AIL movements are expected during the construction programme associated with the delivery of large items of plant and equipment. The exact number and size/ weight is not known at this stage and is based on specific construction methodologies that will be confirmed during detailed design. The route that these will take is outlined within the Framework CTMP (**Application Document Ref. 7.2**).

2.3.11 Smaller abnormal loads are expected to be transported by road from Immingham Dock via the M180 to Junction 2 and then from the A161 to the A18, entering the Proposed Development Site via either the perpendicular construction access or, if required, the skewed construction access off the A18 (**Work No. 8A**) and then over the privately owned North Pilfrey Bridge.

2.3.12 Use of this AIL route would be subject to the load bearing capacity of the skew bridge, as follows:

- SV80 Vehicle (max gross weight 80 tonnes with a maximum basic axle load of 12.5 tonnes); and
- Turbine 4000F delivery vehicle over the central 6m of the carriageway. Vehicle consists of 2 trailers both of 14No. 19.89 tonne axles.

2.3.13 Use of this AIL route would also be subject to the load bearing capacity of North Pilfrey Bridge, as follows:

- normal design loading covering vehicles up to 44 tonnes gross vehicle weight;

- SV80 Vehicle (max gross weight 80 tonnes with a maximum basic axle load of 12.5 tonnes);
- SV100 Vehicle (max gross weight of 100 tonnes with a maximum basic axle load of 16.5 tonnes); and
- SV196 Vehicle (max gross weight of 196 tonnes with a maximum basic axle load of 16.5 tonnes).

2.3.14 An alternative access route for certain abnormal loads that cannot pass over North Pilfrey Bridge that has been used during construction of Keadby 2 Power Station is via Bonnyhale Road.

2.3.15 Should it be necessary, AIL could potentially utilise the route from Ealand village via the A161, A161 Crowle Bridge, New Trent Road and Bonnyhale Road. During Keadby 2 Power Station construction, this was used for up to ten AIL deliveries. No works are required on this route to facilitate its use as an AIL route for the Proposed Development, therefore this route is not included within the Order Limits for the Application. This route would only be used if North Pilfrey Bridge and Railway Wharf are unavailable or if delays to the construction programme would otherwise result. No more than ten AIL movements would use this route and each would be below the axle loading capacity of the A161 Crowle Bridge, owned and maintained by NLC as highway authority.

2.3.16 It is expected that the largest abnormal loads will be received at the Port of Immingham and barged down the River Trent to the Waterborne Transport Offloading Area at Railway Wharf, which is included within the Order Limits for the Application. The components will then be transported to the Proposed Development Site crossing the B1392 onto the temporary haul road that runs to the east of PD Port Services. Traffic management in the form of Stop/ Go signs will be used to halt traffic along the B1392 in order to allow the abnormal loads to cross the B1392.

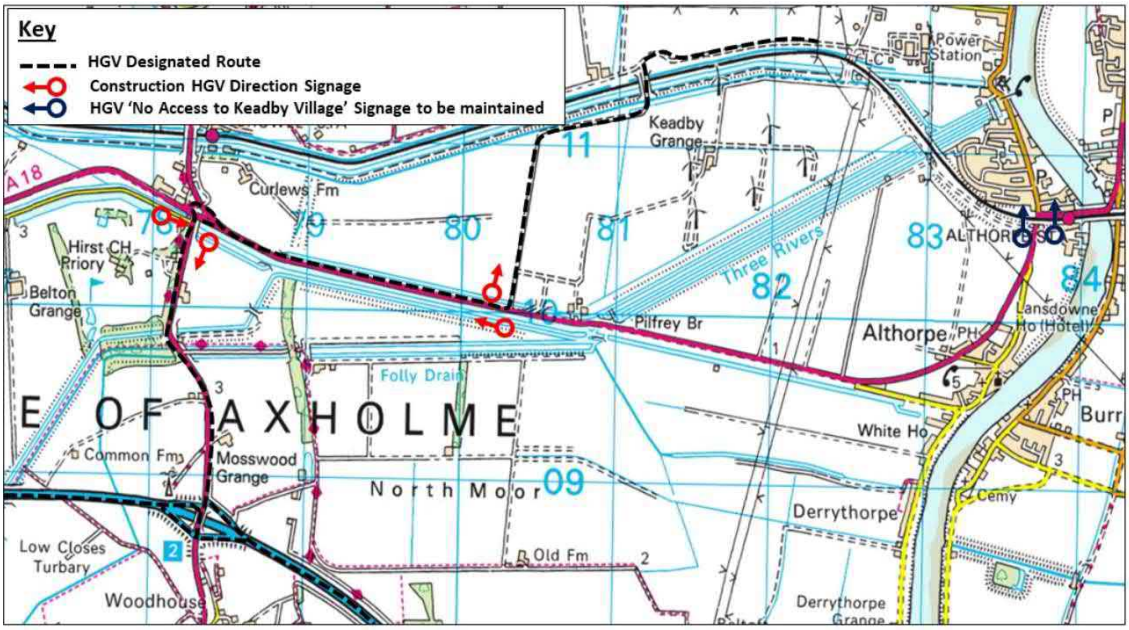
2.3.17 Detail of the routing strategy and procedures for the notification and conveyance of AIL, including agreed routes, the number of abnormal loads to be delivered by road, construction programme, and measures for the temporary protection of carriageway surfaces, the protection of statutory undertakers' plant and equipment, and any temporary removal of street furniture will be set out in the final CTMP, which is secured as a Requirement of the draft DCO (**Application Document Ref. 2.1**).

2.3.18 NLC and Highways England (HE) abnormal loads officer will be consulted at the earliest opportunity on the programme and plan for the delivery of the AIL, as part of or in advance of discharging the relevant DCO Requirement. Relevant asset owners such as Network Rail (with infrastructure below North Pilfrey Bridge) would also be notified.

2.3.19 As has happened on Keadby 2 Power Station, the Applicant would notify and work closely with the Canal and River Trust and harbour authority to minimise restrictions on use of Keadby Lock during AIL deliveries.

2.3.20 The public will also be made aware of when abnormal load deliveries are taking place via a notice on the board at the existing entrance to Keadby 1 Power Station in Keadby village, on the Applicant's Website, and via the press and social media .

**Plate 1: HGV designated route plan during construction**




2.3.21 The contractor must distribute the HGV routing plan to all HGV drivers during their induction. It will be a condition of contract between the Applicant and the appointed contractor to require that all construction HGV deliveries must use the designated route to access and egress the construction site. Sanctions will be put in place to deal with non-compliance.

2.3.22 It is noted that signage is currently in place at locations agreed with NLC for the construction of Keadby 2 Power Station, which aims to facilitate appropriate routing of construction traffic, including avoiding Keadby village.

2.3.23 For the Proposed Development, the contractor will erect signage at the main junctions to appropriately direct all HGV traffic relating to the Proposed Development (both accessing and egressing the site) towards the M180. The indicative signage locations are shown in **Plate 1** above. These will be in place for the duration of the construction phase and will be checked regularly to confirm they are visible throughout.

2.3.24 The appointed contractor will be required to maintain all the HGV route signage.

## 2.4 Parking Provisions

2.4.1 Parking demand will vary throughout the construction phase and parking areas will be set aside within the Proposed Development Site to accommodate parking for construction workers. It is anticipated that this may be on Site within laydown

areas south of North Pilfrey Bridge, adjacent to the access road. If chosen, a park and ride system would then transport the construction workers between the compound and the Proposed PCC Site.

## 2.5 Wheel Cleaning Facility

2.5.1 In the interests of highway safety, wheel cleaning facilities will be installed at the Proposed Development Site from the start of the construction phase. All HGV will be required to use the wheel wash prior to exiting the Proposed Development Site. The need for this measure will be periodically reviewed throughout the construction phase.

## 2.6 Site Lighting

2.6.1 Construction temporary site lighting is proposed to enable safe working on the construction site in the hours of darkness.

2.6.2 Construction temporary lighting will be arranged so that glare is minimised outside the construction site. The appointed contractors will be responsible for establishing the required approach to and levels of lighting and a Lighting Strategy will be prepared for approval pursuant to a requirement in the draft DCO (**Application Document Ref. 2.1**) as required. An Indicative Lighting Strategy is included in the DCO Application (**Application Document Ref. 5.11**).

2.6.3 Lighting will be designed so as not to cause a nuisance outside of the Proposed Development Site in relation to views from residential receptors or light disturbance to ecological receptors.

2.6.4 Details of all external lighting, for both construction and operation are proposed to be secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).

## 2.7 Recycling and Disposing of Waste

2.7.1 To control the waste generated during the site preparation and construction phase, the contractor will minimise the creation of waste, maximise the use of recycled materials and assist the collection, separation, sorting, recycling and recovery of waste arisings, as far as reasonably practicable.

2.7.2 A Site Waste Management Plan (SWMP) will be developed to control construction activities to minimise, as far as reasonably practicable, impacts on the environment and will specify the waste streams to be estimated and monitored and will set goals with regards to the waste produced. A Framework SWMP is included in **Appendix A** of this Framework CEMP. The SWMP will be finalised by the contractor, with specific measures to be implemented prior to the start of construction. This is proposed to be secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).

2.7.3 The Applicant will require that the contractor segregates the waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All

waste to be removed from the Proposed Development Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

## 2.8 Best Practice Measures

2.8.1 The selected contractor would be encouraged to be a member of the 'Considerate Constructors Scheme' which is an initiative open to all contractors undertaking building work.

2.8.2 Construction industry guidance (e.g. from the Construction Industry Research and Information Association (CIRIA)) will be adopted as far as reasonably practicable to assist in reducing the potential for pollution and nuisance. This will be achieved by employing best practice measures.

## 2.9 Soil Management

2.9.1 Impacts relating to the handling, movement and temporary storage of soils, including those agricultural soils classified as 'best and most versatile – Agricultural Land Classification (ALC) Grade 1' that will be disturbed for temporary laydown, will be controlled through the final CEMP. Measures within the final CEMP will include:

- a pre-construction condition survey of laydown areas within Area 2 (ALC Grade 1) including soil depths and textures of soil horizons;
- a method statement for the works to include soil handling and storage proposals;
- a restoration specification; and
- a post-works survey to confirm condition.

2.9.2 All soils will be managed in accordance with the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites (Defra, 2009) to minimise impacts on soil structure and quality.

2.9.3 A Framework Soil Resources Plan is included within **Appendix B** of this report.

# 3.0 IMPACT AVOIDANCE AND MITIGATION MEASURES IMPLEMENTATION PLAN

## 3.1 Overview

3.1.1 This section sets out the embedded impact avoidance and additional mitigation, enhancement and management measures to be included as a minimum in the final CEMP. It also illustrates where additional surveys will be required, either pre-construction or during construction. It describes how the monitoring strategy would be implemented in order to assess the effectiveness of mitigation measures, monitor the impact of construction works and take other actions necessary to enable compliance.

3.1.2 In the final CEMP, this section will identify the responsible party for each mitigation, enhancement measure or monitoring requirement. As a contractor has not yet been appointed, responsibilities cannot be assigned at this stage.

**Table 2: Air Quality**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| Increased nitrogen dioxide ($NO_2$) and particulate matter ($PM_{10}$) from on-site and off-site construction vehicle/plant emissions.<br>Increased particulates and deposited dust from Proposed Development Site activities, materials transportation, storage and handling, including use of haul roads. | Appropriate standard and best practice control measures will be included in the final CEMP, which may include:<br>**Construction Plant, Vehicles and Equipment**<br>• minimise vehicle and plant idling;<br>• where reasonably practicable, locating static plant away from sensitive boundaries or receptors;<br>• minimise operating time outside of normal working hours/ daylight hours;<br>**Transportation, Storage and Handling of Materials**<br>Best practice will be employed, as appropriate, including:<br>• employ wheel wash systems at site exits;<br>• store sand and aggregates in bunded areas and store cement powder and fine materials in silos, where appropriate;<br>• use water suppression and regular cleaning to minimise mud on roads, and control dust during earth moving activities;<br>• emissions from site plant and non-road mobile machinery (NRMM) will be controlled to reduce emissions associated with this source, including restriction of their operation within designated areas only, prohibiting of idling, the enforcement a minimum | To be confirmed in final CEMP. Dust monitoring or recording will be undertaken to an approach agreed with NLC.<br>The ~~results of further consultation with the UKHSA, the~~ Applicant will include representative dust monitoring locations for ~~receptors from~~ properties north of the abnormal load route and south of the water connection corridor, including receptor TR8 (Blackfriars Cottage (former Trentvale Prep School, Keadby)) in the dust monitoring and recording strategy.<br>In the event that significant or unacceptable dust effects on receptors arise from an activity – due to dry weather and high winds for example – activities may need to be | To be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | engine emissions standard and enforcement of maximum site speed limits.<br>• cover vehicles leaving the construction site that are carrying waste materials or spoil;<br>• minimise duration of storage of topsoil or spoil during pipeline construction;<br>• covering or seeding of soil stockpiles if left for extended periods; and<br>• the soil storage area is to be set away from sensitive receptors and Site boundaries.<br><br>**Haul routes**<br>• restrict where practicable the use of unmade roads.<br><br>**Good Site Techniques**<br>• emissions of dust and particulates from the construction phase of the Proposed Development will be controlled in accordance with industry best practice, through incorporation of appropriate control measures according to the risks posed by the activities undertaken;<br>• avoid mechanical roughening or grinding of concrete surfaces;<br>• ~~prohibit open fires~~no burning of waste on Site;<br>• control measures will be implemented to prevent fires and procedures will be prepared and implemented to | ceased following consultation with NLC.<br>Construction generators and haul routes ~~Site plant and NRMM~~ will be sited away from site boundaries and sensitive receptors where possible. Generators will be regulated and monitored through appropriate permits ~~out the construction programme~~ to ensure their sizing, siting and use do not give rise to unacceptable air quality or noise impacts~~is compliant with air quality controls~~. | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | respond to fires, in the event that they were to arise; and<br>• a watching brief will be adopted during the construction works and an asbestos management plan developed as part of the final CEMP. If identified, risks will be managed to ensure legal compliance through the Control of Asbestos Regulations 2012 (HM Government, 2012) governing the handling and disposal of ACM. | | |

**Table 3: Traffic and Transport**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| Severance and intimidation associated with increased construction traffic and abnormal indivisible loads (AIL). Decrease in highways safety and increase in driver delay.<br>Increased traffic flows, including HGV, on the roads leading to the Proposed Development Site | **Construction Traffic Management Plan (HGV and AIL)**<br>• HGV arrivals, including deliveries, will be managed as far as reasonably practicable such that they are spread evenly over the day between the hours of 07:00 and 19:00 Monday to Friday (except bank holidays) and 08:00 to 13:00 on Saturday (if required) to avoid on-site congestion. HGV deliveries will be restricted to these hours unless agreed otherwise with NLC. The only expected HGV deliveries outside these hours may be the delivery of certain AIL, if required. Any noisy works outside the core working hours, including timing of AIL deliveries, if required, would be agreed with NLC on a case by case basis;<br>• traffic movements will be controlled during the Proposed Development construction phase in order to minimise potential impacts on the surrounding road network, namely construction HGV arriving or departing the Proposed Development Site would travel to/ from the west via the A18, A161 and onwards to the M180 Junction 2. It is proposed that all construction HGV will be required to arrive and depart the Proposed Development Site to the west via the M180 Junction 2, the A161 and the A18, entering via the existing perpendicular access point off the A18 | The appointed contractor will undertake such monitoring as is necessary to assess the effectiveness of the measures included in the CTMP to control the routing and impact of construction HGV and final CWTP. This will include the maintenance of gatehouse of records of construction HGV entering and leaving the Proposed Development Site, which will be available to NLC on request.<br><br>Monitoring measures will provide a firm basis upon which to answer queries and complaints. Further details to be confirmed in final CEMP. | Travel Plan Co-ordinator to oversee management, monitoring and implementation of the individual measures within the CTMP and CWTP.<br><br>Other responsibilities to be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | and over Mabey Bridge. As with the construction of Keadby 2 Power Station, a Temporary Traffic Regulation Order (TTRO) is proposed to reduce speed on the A18 in the vicinity of the Proposed Development access from the A18. It is likely that this will be secured at the appropriate time prior to construction with NLC as highway authority.<br>• access into the Proposed Development Site will be controlled by a new gatehouse and HGV waiting area (refer to **Application Document Ref. 4.14**) where vehicle registration and deliveries will be recorded. The location of the gatehouse has been set sufficiently back from the A18 to allow HGV to queue on the access road, rather than on the A18.<br>• the appointed contractor will maintain gatehouse records of construction HGV entering and leaving the Proposed Development Site, which will be made available to NLC on request;<br>• should any complaints be raised by members of the public with regards to construction HGV not using the dedicated HGV route to the Proposed Development Site, gatehouse records along with CCTV footage obtained from the gatehouse would be used to identify the offending HGV involved and appropriate sanctions put in place with the aim of avoiding repeat events; | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | • the appointed contractor must ensure that the designated HGV route (which is the most direct route from the motorway network) is adhered to by HGV drivers and the contractor must ensure that the policy and routing plan is distributed to all HGV drivers. This policy will be reinforced during staff inductions and will include HGV drivers being made aware specifically not to access the Proposed Development Site via Keadby village (except in case of emergency), with sanctions put in place to deal with non-compliance with the aim of ensuring no repeat events;<br>• to ensure compliance with the measures set out above, the contractor must enforce the disciplinary procedure, 'yellow/ red card system' or equivalent. In the first event of non-compliance, a warning will be issued to the HGV driver (yellow card). In the event of any repeat of the contravention, that driver will be prohibited from making further HGV deliveries to the Proposed Development Site (red card);<br>• the contractor must distribute the HGV routing plan to all HGV drivers during their induction. It will be a condition of contract between the Applicant and the appointed contractor to aim to ensure that all construction HGV deliveries must use the designated route to access and egress the construction site. Sanctions will be put in place to deal with non- | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | compliance in the interests of highway safety, wheel cleaning facilities will be installed at the Proposed Development Site from the start of the construction phase. All HGV would be required to wheel wash when exiting the Proposed Development Site. The need for this measure will be periodically reviewed throughout the construction phase;<br>• A 24-hour contact name and number will be displayed on a notice board at the Proposed Development Site entrance and on the Applicant's website, for members of the public to contact should they have any issues regarding construction traffic. The contact number could also be displayed on the Keadby with Althorpe Parish Council website if they wish to host this;<br>• residents will be updated on the construction of the Proposed Development via a regular update bulletin posted on the Applicant's website. This will include information on the timing and routing of AIL deliveries and a 24-hour contact name and number for members of the public to contact should they have any issues regarding construction traffic. It is anticipated that the project liaison manager will act as the initial point of contact for members of the community to find out further information. A link to this information could also be provided on the | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | Keadby with Althorpe Parish Council website if they wish to host this;<br>• the Applicant will notify and work closely with the Canal and River Trust and harbour authority to minimise restrictions on use of Keadby Lock during AIL deliveries. The public will also be made aware of when AIL deliveries are taking place via a notice on the board at the existing entrance to Keadby 1 Power Station in Keadby village, on the Applicant's Website, and via the press and social media;<br>• the contractor will erect signage at the main junctions to appropriately direct all HGV traffic relating to the Proposed Development (both accessing and egressing the site) towards the M180. These will be in place for the duration of the construction phase and will be checked regularly to confirm they are visible throughout. The appointed contractor will be required to maintain all the HGV route signage. Traffic management in the form of Stop/ Go signs will be used to halt traffic along the B1392 in order to allow the abnormal loads to cross the B1392.<br>• NLC and Highways England's abnormal loads officer would be consulted at the earliest opportunity on the programme and plan for the delivery of the AIL. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | As is currently undertaken for the construction of Keadby 2 Power Station, a formal process of liaison between all relevant parties (Principal Contractor, NLC and Highways England) via a Local Liaison Committee, will:<br><br>• make all parties aware of the results of monitoring of the final CTMP;<br>• provide a route by which any complaints can be communicated and dealt with; and<br>• provide a route through which transport related issues can be identified and dealt with.<br><br>**Construction Worker Travel Plan (CWTP)**<br>The contractor will prepare and implement a CWTP – to include the following measures:<br>• provide all construction staff with an awareness of the advantages and potential for travel by more sustainable and environmentally friendly modes of transport, through raising awareness and the provision of information identifying travel options and the necessary contact information.<br>• implementation of measures and procedures to encourage construction workers to adopt modes of transport which reduce reliance on single occupancy private car use; | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | • contractors will be encouraged to provide minibuses for transporting their workers from the key points of construction worker origin to the Proposed Development Site;<br>• it is proposed that sections of the car park will gradually be opened up as construction develops, with a defined number of construction worker car parking spaces to be provided during construction. Managing the number of parking spaces available on-site will help to control the number of vehicles and promote sustainable transport options. It will be the responsibility of the Travel Plan Co-ordinator working closely with the Site Manager, to determine the amount of spaces to be provided;<br>• car parking at the Proposed Development Site will be monitored by the Travel Plan Co-ordinator, with restricted access. The Site Manager and the Travel Plan Co-ordinator will set the appropriate criteria for construction workers to receive a pre-allocated parking space;<br>• the contractor will be encouraged to set up and manage a car share scheme for workers;<br>• in emergencies, the Travel Plan Co-ordinator will provide a guaranteed lift home for construction staff that travelled to Site; | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | • the contractor will encourage the use of common hotels and B&Bs by workers that are not from the local area, as this will encourage the use of shared transport modes. The contractor will be requested to provide minibuses and to organise where the minibuses will pick up workers and at what times;<br>• secure parking for bicycles will be provided and staff that cycle to work will have access to showers, changing facilities and lockers to store clothing, cycle helmets etc.;<br>• an on-site storage facility will be provided. This facility would encourage construction workers to store their tools on-site. This will reduce the number of tools they would need to carry each day and assist those workers who are considering cycling or car sharing as a potential travel mode;<br>• details of the sustainable transport options available for accessing the Site will be provided in an information pack and sent to construction workers, prior to them starting work at the Site. The contractor will be responsible for ensuring all construction workers receive the information pack prior to starting work on Site;<br>• all construction workers will receive an introductory meeting on the travel plan when they commence | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | work, incorporated into the Site safety briefing. It will include the provision of the following information:<br>○ designated access and exit routes to the Site;<br>○ details of sustainable transport measures available for accessing the Site; and<br>○ parking arrangements.<br>• the contractor will be responsible for encouraging and promoting the use of sustainable transport measures included within the CWTP and organising crew minibuses to transport workers to and from the Site, where appropriate. The Applicant will liaise with the appointed contractor to implement these and car sharing options;<br>• the Travel Plan Co-ordinator's details would be supplied to NLC and Highways England;<br>• the Travel Plan Co-ordinator will work closely with the Site Manager, who has overall responsibility for the Site, and thus has the authority to introduce measures for those workers who do not follow the guidelines;<br>• the contractor will be responsible for managing how their workers travel to and from the Proposed Development Site in order to control the demand for | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | car parking spaces. The contractor's responsibilities will primarily include:<br>○ providing a Travel Plan Co-ordinator to oversee the management and delivery of the CWTP;<br>○ encouraging and promoting the use of sustainable transport measures included within the CWTP; and<br>○ organising crew minibuses to transport workers to and from the Proposed Development Site, where appropriate.<br>The final CEMP will include vigilance and security systems to safely shutdown the plant in the event of any aircraft related incident.<br>During the commissioning (and operational) phase, working with suppliers to ensure that all relevant materials (including chemicals) bought to the Proposed Development Site that are classified as hazardous are transported in compliance with applicable regulations including the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG Regs) (as amended). | | |

**Table 4: Noise and Vibration**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| Construction noise and construction road traffic noise at nearby Noise Sensitive Receptors (NSR).<br><br>Vibration due to construction activities causing annoyance at NSR and/ or damage to building structures. | Core construction working hours would be 07:00 to 19:00 Monday to Friday and Saturday (08:00 to 13:00). As described in **Chapter 5:** Construction Programme and Management (ES Volume I - **Application Document Ref. 6.2**), core working hours associated with installation of any cofferdam required for the River Water Abstraction Option would be restricted to daytime hours only. However, for other construction activities, it is assumed that some works may need to take place outside of these core working hours and would be undertaken providing that they comply with any restrictions agreed with NLC, in particular regarding control of noise and traffic.<br><br>Measures to mitigate noise will be implemented during the construction phase of the Proposed Development in order to minimise impacts at local NSR and ecological receptors, particularly with respect to activities required outside of core working hours. Mitigation (to be included in the final CEMP) shall include, but not be limited to:<br>• abiding by agreed construction noise limits at locations to be agreed with NLC;<br>• ensuring that processes are in place to minimise noise before works begin and ensuring that best practicable means (BPM) are being achieved | The final CEMP will set out a scheme for the provision of information to NLC and local residents to advise of potential noisy works. ~~that are due to take place and for monitoring of n~~Our procedure for monitoring and managing noise complaints and other issues raised by stakeholders will be set out in the Applicant's complaints procedure, the details of which will be included in the final CEMP. This will include the name and contact details of the dedicated Stakeholder Manager with responsibility for liaising with members of the local community.<br>All issued will be reported~~ing~~ to the Applicant for immediate investigation and action. | To be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | throughout the construction programme, including the use of localised screening around significant noise producing plant and activities;<br>• ensuring that modern plant is used, complying with applicable UK noise emission requirements, and selection of inherently quiet plant where possible;<br>• hydraulic techniques for breaking to be used, where breaking is required, in preference to percussive techniques where reasonably practicable;<br>• use of lower noise piling (e.g. rotary bored or hydraulic jacking) rather than driven piling techniques, where reasonably practicable;<br>• off-site pre-fabrication for components of the Proposed Development, where reasonably practicable;<br>• a soft-start or slow ramp-up of piling hammer power will be employed at the commencement of any impact piling activity or after a break of more than 10 minutes;<br>• all plant and equipment being used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use;<br>• all contractors to be made familiar with current legislation and the guidance in BS 5228 (Parts 1 and | The need for monitoring of noise and vibration levels during construction will be determined through the detailed assessment undertaken.<br><br>Details to be confirmed in Final CEMP. | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | 2) (BSI, 2014a and 2014b), which should form a prerequisite of their appointment;<br>• loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials within the Proposed Development Site to be conducted in such a manner as to minimise noise generation, as far as reasonably practicable;<br>• appropriate routing of construction traffic on public roads and along access tracks, to reduce construction traffic noise, as far as reasonably practicable;<br>• provision of information to NLC and local residents to advise of potential noisy works that are due to take place;<br>• monitoring of noise complaints and reporting to the Applicant for immediate investigation.<br>• construction activities taking place outside core working hours will need to be planned, managed and controlled appropriately so they do not exceed the SOAEL threshold values.<br><br>The list of noise control measures presented within Chapter 9: Noise and Vibration (ES Volume I, Document Ref. 6.2) and summarised here provide a detailed but not exhaustive list of construction noise management measures. The measures listed will be implemented and | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | supplemented as necessary with further bespoke measures identified through further detailed assessment as part of the Final CEMP. With respect to reduction of noise levels during cofferdam piling, this may include, but not limited to, use of a temporary acoustic barrier alongside the River Trent, use of a partial enclosure around hammer, and the use of a non-metallic dolly between the hammer and the driving helmet (for driven piling) to prevent metal on metal impact sound. The need for monitoring of noise and vibration levels during construction will also be determined through the detailed assessment undertaken.<br><br>Method statements regarding construction management, traffic management, and overall site management will be prepared in accordance with best practice and relevant British Standards, to help to reduce impacts of construction works. One of the key aims of such method statements will be to minimise noise disruption to local residents during the construction phase as far as reasonably practicable.<br><br>Regular communication with the local community throughout the construction period will take place to publicise the works schedule, giving notification to residents regarding periods when higher levels of noise | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | may occur during specific operations, and providing lines of communication where complaints can be addressed.<br><br>The selected contractor will be encouraged to be a member of the 'Considerate Constructors Scheme'.<br><br>There will be specific consideration regarding the control and mitigation of impacts on fish, within the Final CEMP.<br><br>A final CEMP will be prepared which will include setting out provisions to ensure that the noise and vibration impacts relating to construction activities are reduced, as far as reasonably practicable.<br><br>To assist in the preparation of the final CEMP, a detailed noise and vibration assessment will be undertaken once the contractor is appointed and further details of construction methods are known in order to identify specific mitigation measures for the Proposed Development (including construction traffic).<br><br>Further assessment has been identified as being required pre-construction, to ensure that appropriate mitigation measures are developed to achieve the ABC threshold noise values once the contractor is appointed. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | The control and monitoring of noise during construction is proposed to be secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).<br><br>**Construction Vibration**<br>Should the River Water Abstraction Option be selected requiring that construction works, including a cofferdam installation/ removal take place at locations close to, or within, the River Trent SPA/ Ramsar site/ SSSI, vibration impacts on ecological receptors would be minimised by applying the Joint Nature Conservation Commission (JNCC) best-practice measures for piling including the implementation of a soft-start process and avoidance of night-time piling, thereby offering marine ecological receptors respite from any disturbance.<br><br>Additional measures to minimise environmental impacts at the River Water Abstraction Option intake would include:<br>• adoption of the Joint Nature Conservation Commission (JNCC) best-practice measures for piling including the implementation of a soft-start process;<br>• avoidance of night-time piling; | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | • adherence to the agreed seasonal restriction of September to November (inclusive) to avoid the key upstream migration of adult salmon; and<br>• use of silt curtains (to minimise impacts on water quality).<br><br>Regular communication with the local community throughout the cofferdam installation/ removal will also serve to publicise the works schedule, giving notification to residents regarding periods when perceptible levels of vibration may occur during specific operations, reassuring that these levels are significantly below the levels at which building damage may occur and providing lines of communication should complaints arise.<br><br>Measures would therefore be put in place to control or restrict activities during evenings/ night-time so as not to exceed the SOAEL or relevant noise limit at locations to be agreed with NLC.<br><br>The measures listed will be implemented and supplemented as necessary with further bespoke measures identified through further detailed assessment as part of the Final CEMP. | | |

**Table 5: Biodiversity and Nature Conservation**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| Clearance or damage of habitat/ vegetation to facilitate construction – resulting in temporary or permanent reduction in habitat extent and potential direct and indirect effects on associated species.<br><br>Loss of and direct effects on drains leading to loss of habitat.<br><br>Cofferdam works resulting in fish being potentially trapped within any cofferdam structure | **Application Document Ref 5.10**: Landscaping and Biodiversity Management and Enhancement Plan (LBMEP) sets out the measures proposed to mitigate the potential impacts and effects of the Proposed Development on biodiversity (and landscape) features, and to enhance the biodiversity, landscape and green infrastructure value of the Site.<br><br>A final LBMEP, which will take into account and be prepared in accordance with the principles of the LBMEP, will be submitted to and approved by NLC. This is proposed to be secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).<br><br>Measures proposed in the LBMEP (**Application Document Ref. 5.10**) and outlined in **Chapter 11:** Biodiversity (ES Volume I - **Application Document Ref. 6.2**) include:<br>• all watercourses will be protected and subject to appropriate stand-offs (including those associated with proposed temporary construction laydown areas) except where construction works have been identified as necessary within **Chapter 4:** Proposed Development or **Chapter 5:** Construction Programme and Management (ES Volume I - **Application Document Ref. 6.2**), and as | 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 approved CEMP and other relevant approved plans and permits. This will provide up to date information on relevant protected or notable species whose status or distribution may have changed since baseline surveys were completed (e.g. badger). Specifically:<br><br>• appropriately experienced ecologists will complete Site walkovers in advance of mobilisation or other | Section 7 of the Landscape and Biodiversity Management and Enhancement Plan (**Application Document Ref 5.10**) sets out roles and responsibilities for implementation , but these would be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| and be affected by dewatering.<br><br>Potential for seeds/ propagules of plant species and aquatic animal invasive non native species (INNS) to be disturbed and transferred to new sites as a result of construction activities associated with the Proposed Development. | assessed within the ES. Any impact on such watercourses will be minimised and appropriate mitigation will be adopted;<br>• appropriate measures will be used to limit silt mobilisation and potential for scour, if appropriate, during the installation and removal of the temporary cofferdam, should the River Water Abstraction Option be chosen; and<br>• updated ecological surveys would be completed prior to the start of construction, where necessary, to gain up to date information on relevant protected or notable species whose status or distribution may have changed since baseline surveys were completed (e.g. badger). This would be required to inform protected species licence applications (where necessary), or otherwise to determine appropriate mitigation requirements. Based on current data a water vole licence may be required prior to infilling of the drain within the Main Site, as a single territory was found. However, the status of water vole could change (decrease or increase) prior to construction so the need for a licence would need to be confirmed prior to construction.<br><br>**The Appointed Ecologist**<br>The appointed ecologist will be responsible for:<br>• advising the Applicant on ecological matters and requirements for compliance with relevant legislation and protected species licences, providing support as | potential advance works to re-confirm the ecological baseline conditions and identify any new ecological risks. 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;<br>• any additional surveys will be instructed during the advance works, site clearance and construction phases as identified as necessary by the ecologist or landscape architect, or otherwise as identified and requested by the Applicant or their contractor(s) when implementing the approved CEMP and other relevant | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | instructed, and monitoring compliance with the final approved LBMEP;<br>• reviewing the LBMEP at appropriate intervals and revising management requirements as necessary for the following five year period and subsequently for the duration of the LBMEP's implementation; and<br>• providing the Applicant with survey reports and other written evidence required in accordance with the agreed scope of work and contractual obligations.<br><br>**The Applicant and/ or the Appointed Main Contractor**<br>The Applicant and/ or appointed main contractor will be responsible for:<br>• 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, landscape contractors, construction contractors and management organisations);<br>• compliance with the final approved LBMEP, relevant legislation and any relevant planning commitments;<br>• keeping the appointed ecologist/ landscape architect/ arboriculturalist informed of work activities that require support and supervision, so that it is clear when attendance on-site is required;<br>• enacting/ enforcing recommendations made by the ecologist/ landscape architect/ arboriculturalist, or | approved plans and permits;<br>• based on current data a water vole licence may be required prior to infilling of the drain within the Main Site, as a single territory was found. However, the status of water vole could change (decrease or increase) prior to construction so the need for a licence would need to be confirmed prior to construction;<br>• 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;<br>• standard construction risk management and avoidance measures for | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | 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<br>• keeping a record of measures taken to deliver the requirements of the final LBMEP, to provide an auditable record of compliance.<br><br>**Clerk of Works**<br>• a Clerk of Works (CoW) will be employed, to supervise and manage the implementation of measures to mitigate impacts on ecological features, including protected species, prior to and during the construction phase. This will encompass both licensed and relevant unlicensed activities;<br>• the CoW will supervise vegetation clearance and construction excavations. A CoW will be employed to supervise all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance;<br>• the Applicant will agree when a 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 programme; and | nesting birds will be undertaken;<br>• 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 Site to inform mitigation requirements and support protected species licence applications.<br>• an arboricultural survey in line with BS5837:2012 will be undertaken concurrently with the detailed design, to identify where 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;<br>• immediately prior to site clearance and the start of | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | • relevant site staff will receive toolbox talks on the ecological risks present, legal requirements and working arrangements necessary to comply with legislation. Toolbox talks will be repeated as necessary over the duration of the relevant works.<br><br>**Lighting**<br>• construction temporary lighting will be designed so that excessive glare is minimised outside of the construction site, including towards the former Keadby Ash Tip and Stainforth and Keadby Cana habitat corridors, as far as reasonably practicable.<br><br>**Habitat Restoration/ Reinstatement**<br>• all habitats disturbed during construction, such as land within the temporary construction laydown areas, electricity connection route and proposed abstraction options/ discharge corridors, will be reinstated on a like-for-like basis at the same location following construction;<br>• some habitats lost during construction of permanent infrastructure can also be restored;<br>• further details are provided in the LBMEP (**Application Document Ref 5.10**). | construction in each relevant part of the Proposed Development Site, further site walkover surveys will be undertaken by an appropriately experienced CoW to confirm whether the risks remain as previously assessed and/ or to confirm the correct implementation of impact avoidance measures (e.g. protected species stand-offs);<br>• the scope of the required walkovers will be defined on a case by case basis, in consultation with the project team and NLC or other relevant statutory consultees as necessary, based on the specific risks associated with each relevant part of the Proposed Development | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | **Breeding/Nesting Birds**<br>The following approach would be taken to deliver legislative compliance in relation to nesting birds:<br>• 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;<br>• all clearance of other suitable vegetation will be undertaken outside the breeding season (typically March-August inclusive for most species), where possible;<br>• where there would be a gap in activity between site clearance/ soil stripping and the start of construction, then all cleared ground would be maintained in a disturbed state (e.g. through regular harrowing to minimise the risk of ground nesting birds establishing in the lead in to construction.<br>• site inductions and toolbox talks as appropriate;<br>• in situations where the above breeding bird mitigation is not possible, the CoW will check the working area for nests before works commence. If active nests are discovered through this process, then the CoW will | and the findings of any preceding updated surveys | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | 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<br>• consistent with the above, should Wildlife and Countryside Act (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.<br><br>**Water Vole**<br>A Water Vole Impact Avoidance Strategy will be prepared, using updated baseline information, and agreed with relevant stakeholders to specify 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 this Framework CEMP.<br><br>The Water Vole Impact Avoidance Strategy will include:<br>• the latest updated survey data for relevant field drains;<br>• requirements for further surveys (or the results of further surveys completed in advance to inform the | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | Strategy), ongoing monitoring and attendance by an appropriately experienced CoW;<br>• 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;<br>• options for micro-siting to avoid water vole and its burrows;<br>• appropriate timings to minimise potential for disturbance impacts on water vole;<br>• requirements for habitat mitigation and enhancement to accommodate any water voles displaced as a result of land take for the Proposed Development;<br>• requirements (if relevant) for displacement, trapping, exclusion and relocation of water voles from relevant construction areas. 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;<br>• site inductions and toolbox talks as appropriate; and<br>• any 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 | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | needed to secure this licence. Proposals for water vole enhancement are already allowed for and outlined within this LBMEP (**Application Document Ref. 5.10**), as well as to benefit other freshwater biodiversity.<br><br>**Fish**<br>A Fish Management Plan will be prepared and agreed with relevant stakeholders to specify the measures and supervision required to deliver legislative compliance during installation and drawdown of any cofferdam(s) for the upgrade of either the River Water Abstraction Option or the Canal Water Abstraction Option on the Stainforth and Keadby Canal. This would also apply if relevant to replacement of the existing Mabey Bridge over the Hatfield Waste Drain LWS. Prior submission and approval of the Fish Management Plan is a commitment of this Framework CEMP.<br><br>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).<br><br>The installation and subsequent removal of the single temporary cofferdam required to enable construction | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | (depending on the chosen option) of the Proposed Canal Water Intake (including eel screens) or the upgrade of the Proposed River Water Intake will be completed in accordance with the requirements of the relevant regulators, including (if relevant) restriction of piling works to avoid the main migratory periods of noise and vibration sensitive fish species (which is September to November) and restricting piling works to core daytime hours to minimise potential impacts on migrating fish.<br><br>The Fish Management Plan will include details of:<br>• appropriate timings to minimise potential for disturbance to migratory fish;<br>• provision for screening of pump intakes to prevent fish being drawn into the pipe/ pump;<br>• supervision of dewatering of any cofferdam(s) by an appropriately experienced ECoW to oversee fish rescue prior to dewatering, 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<br>• if appropriate, 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. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | **Animal Welfare during Construction**<br>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 associated with 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. The required details will be submitted in the final LBMEP to be agreed as a Requirement of the draft DCO (**Application Document Ref. 2.1**).<br><br>Vegetation clearance and construction excavations have potential to affect wildlife and may result in offences under animal welfare legislation if not appropriately managed. An ECoW will be employed to supervise all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance.<br><br>All excavations will be covered or fenced 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. reptiles, badger, otter, brown | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | hare, hedgehog) that may stray into the construction site to vacate excavations, should they fall in.<br><br>**Invasive Species Management Plan (ISMP)**<br>A plant INNS survey will be undertaken prior to construction to determine the current location and extent of plant INNS. If determined as necessary through this survey and after consideration of other available plant and animal INNS data, an ISMP will be prepared to accompany the final CEMP and would be agreed with relevant stakeholders. The ISMP will specify the measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations. 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.<br><br>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 land required for construction (none were present at the time of the baseline survey). | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | It will be assumed that plant and invertebrate INNS are present in all watercourses affected by construction, regardless of the scale of the proposed construction works.<br><br>Biosecurity requirements will address all potential pathways for interaction with and dispersal of INNS, including movements of vehicles, machinery and staff:<br>• into the Proposed Development Site from third party locations, e.g. during construction mobilisation;<br>• between different parts within the Proposed Development Site, most especially movements between different watercourses; and<br>• from the Proposed Development Site for redeployment elsewhere.<br><br>**Badgers**<br>• an updated badger survey will be completed in advance of construction works to re-confirm the status and distribution of badgers;<br>• mitigation requirements will be reviewed and confirmed based on this updated badger survey; and<br>• if subsequently determined as necessary follow re-survey, a badger development licence would be | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | obtained from Natural England to permit works likely to result in offences under the relevant legislation.<br><br>**Tree Works**<br>• where works in close proximity to retained trees cannot be practicably avoided, these works will be undertaken in accordance with current best practice, 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); and<br>• all necessary protective fencing will be installed prior to the commencement of site clearance or construction works.<br><br>**Piling**<br>The JNCC best-practice measures for piling will be adopted, including the implementation of a soft-start process and avoidance of night-time piling. In addition, a seasonal restriction will be adopted to minimise disturbance to sensitive fish species. As informed by technical engagement with | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | relevant marine stakeholders, this is expected to require the avoidance of the period September to November inclusive. | | |

**Table 6: Landscape and Visual Amenity**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| Visibility of new landscape features.<br><br>Increased visibility of construction activities and vehicles.<br><br>Permanent removal of areas of recently reseeded grassland and minor losses of scattered scrub where this coincides with localised areas required for temporary works (e.g. the laying of electrical connections).<br><br>Temporary removal of areas of arable farmland for | Mitigation and enhancement measures set out in the LBMEP (**Application Document Ref. 5.10**) include:<br>• 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;<br>• 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. It is proposed that finishes and materials would be agreed with relevant consultees and approved by NLC at the detailed design stage, secured through a Requirement of the draft DCO (**Application Document Ref. 2.1**), in order to minimise the visual impact of the Proposed Development;<br>• 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; and | To be confirmed in final CEMP. | To be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| construction laydown activities.<br><br>Removal of arable farmland, minor losses of scattered scrub where it coincides with localised areas required for temporary works (e.g. the laying of electrical connections) and recently reseeded grassland. | • where existing vegetation is present along the Proposed Development Site boundary, this will be retained, as far as reasonably practicable, and managed to ensure its continued presence to aid the screening of low level views into the Proposed Development Site.<br><br>**Lighting**<br>A Light Management Plan (LMP) will accompany the final CEMP which sets out the approach for use of lighting during the construction phase.<br><br>Lighting required during the construction stage of the Proposed Development will be designed to reduce unnecessary light spill/ glare outside of the Proposed Development Site boundary, in accordance with the Indicative Lighting Strategy (**Application Document Ref. 5.11**).<br><br>A representative calculation for lighting of compounds or lighting plan with indicative equipment to be used on site will be developed supporting the LMP and presented to NLC for approval prior to construction works taking place. | | |

**Table 7: Geology, Hydrogeology and Land Contamination**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| Mobilising existing contamination in soil and groundwater as a result of ground disturbance and potential de-watering during construction.<br><br>Increasing the potential for contaminants in unsaturated soils to leach to groundwater in open excavations during construction.<br><br>Increasing the potential for contaminated surface run-off to migrate to surface water and | **Ground Investigation**<br>A preliminary planned targeted ground investigation proposed in 2021 will include ground gas monitoring. Consultation with appropriate stakeholders such as National Grid Gas and the Environment Agency will be undertaken to manage interfaces and define appropriate control measures.<br><br>**Construction**<br>The final CEMP will contain measures to ensure compliance with relevant standards and legislation. The final CEMP will set out the environmental mitigation requirements and also the project level expectations on how the Proposed Development will be constructed. Measures contained within the final CEMP will be designed to limit the potential for dispersal and accidental releases of potential contaminants, soil derived dusts and uncontrolled run-off to occur during construction. For example, the final CEMP will set out how material is to be excavated, segregated and stockpiled to minimise the potential for run-off, soil quality degradation and wind dispersal of dusts.<br><br>Piling design and construction works will be completed following preparation of a piling and penetrative foundation design method statement, informed by a risk assessment, completed in accordance with the Environment Agency's | Ground investigation will be undertaken before construction to inform the development of the preliminary and detailed design. The ground investigation will validate the assumptions made in the initial Conceptual Site Model and Preliminary Risk Assessment (**Appendix 13A:** Phase 1 Desk-based Assessment) and in **Appendix 13C**: Potential Areas of Contamination Baseline Risk Scores and Further Risk and Impact Assessment (ES Volume II - **Application Document Ref. 6.3**) and provide site-specific data upon which to base a land contamination risk assessment.<br><br>The ground investigation will be designed to target the potentially contaminative sources identified, including the | To be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| groundwater receptors as a result of leaching from uncovered stockpiles.<br><br>Introducing new sources of contamination, such as fuels and oils used in construction plant.<br><br>Creating preferential pathways for the migration of soil contamination and gases, for example, along new below ground service routes, service ducts and as a result of potential de-watering.<br>Introducing new human health | 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' (Environment Agency 2001). The method statement will be submitted to, and after consultation with the Environment Agency, approval sought from NLC prior to relevant works commencing, secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).<br><br>The final CEMP will establish procedures for dealing with unexpected soil or groundwater contamination that may be encountered. This would typically require affected works to stop to enable appropriate people to be notified, and further characterisation and risk assessment to be undertaken before remediation or mitigation proposals are agreed with all required stakeholders.<br><br>A Soil Resources Survey will be outlined in the final CEMP. A Framework Soil Resource Plan (SRP) is presented in **Appendix B** of this Framework CEMP.<br><br>In accordance with CIRIA C692, 2010 the following measures are proposed:<br>• measures to minimise dust generation; | historical landfilling activities identified on the Proposed Development Site. Where risks are deemed to be unacceptable, further detailed quantitative risk assessment and if required, detailed remediation strategies will be developed accordingly, pursuant to the process set out by the planning authorities.<br><br>Additional measures to be confirmed in final CEMP. | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| receptors such as site staff during and post construction.<br><br>Temporary effects during the construction period from ground disturbance. | • provision of Personal Protective Equipment (PPE), such as gloves, barrier cream, overalls etc. to minimise direct contact with soils;<br>• provision of adequate hygiene facilities and clean welfare facilities for all construction site workers;<br>• monitoring of confined spaces for potential ground gas accumulations, restricting access to confined spaces, i.e. to suitably trained personnel only, and use of specialist PPE, where necessary; and<br>• preparation and adoption of a site and task specific health and safety plan as is required under Health and Safety legislation.<br><br>A Pollution Response Plan will be in place prior to the commencement of construction works. The plan will outline key pollution mitigation measures to be adopted including a Control of Substances Hazardous to Health (COSHH)/ fuel inventory and key contacts to be notified in the event of a significant pollution incident, which may subsequently lead to the contamination of controlled waters or soils. Relevant staff will be Spill Response Trained and any spillage incidents would be reported to Environment Agency and/ or Canal and River Trust emergency numbers, as appropriate. All bulk fuel and COSHH items will be stored in accordance with the relevant Environment Agency Guidance for Pollution | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | Prevention (GPP) documents and where relevant, Pollution Prevention Guidance notes (the latter having been withdrawn but at the time of writing, widely considered good practice) NetRegs website (2020) and storage regulations. Tanks and dispensing pumps will be locked when not in use to prevent unauthorised access.<br><br>Any hazardous materials will be stored in designated locations with specific measures to prevent leakage and the release of their contents. This will include a requirement to position storage areas at least 10m away from surface water features/ drains (and take into consideration the positions of any groundwater abstraction wells), on an impermeable base with an impermeable bund that has no outflow and is of adequate capacity to contain at least 110% of the contents. Valves and trigger guns will be protected from vandalism and kept locked when not in use.<br><br>Only well-maintained plant will be used during construction to minimise the potential for accidental pollution from leaking machinery or damaged equipment. Static machinery and plant are expected to be stored in hardstanding areas when not in use and, where necessary, to make use of drip trays beneath oil tanks/ engines/ gearboxes/ hydraulics. Spill response kits containing equipment that is appropriate to the types and quantities of materials being used and stored | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | during construction will be maintained on the Site for the duration of the works.<br><br>The final CEMP will set out procedures for dealing with unexpected soil or groundwater contamination that may be encountered. This would typically require affected works to stop to enable appropriate people to be notified, and further characterisation and risk assessment to be undertaken before remediation or mitigation proposals are agreed with all required stakeholders.<br><br>Specific mitigation measures may be required in the form of treating/ remediating any contamination encountered during construction (e.g. any contamination that may be associated with any potentially contaminative sites identified as part of the assessment, notably the landfills and areas of potentially infilled land). This will be confirmed based on information gathered through ground investigation.<br><br>Any remediation works, or the removal of contaminated soils or waters associated with the construction of the Proposed Development would be expected to result in the enhancement of the local environment. | | |

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| | **Excavated Materials Management**<br>Prior to construction, a strategy will be prepared as part of the design development, which will set out how the earthworks stage of the construction phase will be undertaken. Where necessary the strategy will consider what excavated materials can be reused or are required for the various components of the Proposed Development, and what materials are surplus and require either disposal or onward management to ensure appropriate re-use.<br><br>To minimise the effects on soil resources during any earthworks, including materials management following foundation construction in relation to the Proposed Development, high standards of soil handling and management will be employed with a view to minimising where possible the double handling of soils and the extent to which exposed soils will be left vulnerable to erosional processes.<br><br>The re-use of excavated materials during construction will be governed by either a Materials Management Plan developed in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice (2011), an environmental permit or a relevant exemption.<br><br>The disposal of soil waste, contaminated or otherwise, to landfill sites would be best mitigated by minimisation of the overall quantities of waste generated during construction, and by ensuring that excavated material consigned to landfill | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | cannot, as an alternative, be put to use either on the Proposed Development or on other sites.<br><br>Where there is a requirement to dispose of surplus excavated materials off site as waste, the material will be characterised to determine firstly whether it is Hazardous or Non-Hazardous waste in accordance with the Environment Agency's Technical Guidance WM3 and then once this is established, the appropriate disposal facility will be determined through Waste Acceptance Criteria (WAC) analysis, as required. | | |

**Table 8: Water Environment and Flood Risk**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| Leakage or accidental spillage of construction materials, sediments and potential pollutants used on-site, migrating to nearby surface watercourse or drains or infiltrating to groundwater.<br><br>Flood Risk.<br><br>Loss of habitat within watercourse and physical changes to watercourses e.g. scour.<br><br>Physical works to watercourse | **General**<br>Prior to construction starting on-site, a Final CEMP will be prepared by the Contractor(s) and would outline the measures necessary to avoid, prevent and reduce adverse effects where possible on the local surface water and groundwater environment. This will be detailed within a Water Management Plan (WMP) that will form a technical appendix to the Final CEMP. The WMP will provide greater detail regarding the mitigation to be implemented to protect the water environment from adverse effects during construction.<br><br>The final CEMP will be reviewed, revised and updated as the project progresses towards construction to ensure all relevant potential impacts and residual effects are considered and addressed as far as reasonably practicable, in keeping with available good practice at that point in time. The principles of the mitigation measures set out below are the minimum standards that the Contractor will implement. However, it is acknowledged that for some issues, there are multiple ways in which they may be addressed. In addition, the methods of dealing with pollutant risk will need to be continually reviewed on-site and adapted as construction works progress in response to different types of work, weather conditions, and locations of work. | The final CEMP will include details of necessary water quality monitoring including visual observations, in situ testing using handheld water quality probes and periodic sampling for laboratory analysis. Water quality monitoring pre-construction and during construction will be undertaken.<br><br>Requirements for water quality monitoring during construction will be explained in the Final CEMP. These would be further developed by the Principal Contractor in consultation with the Environment Agency (due to works potentially impacting flow in a main river and WFD waterbodies), the LLFA and/ or IDB (due to works potentially impacting flow in ordinary | To be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| leading to adverse impact against hydromorphological status. | The Contractor will as a minimum conform to all permit/consent/licence requirements and best practice measures to avoid, reduce and minimise the risk of water pollution or unacceptable physical impacts (without mitigation) on waterbodies.<br><br>The relevant Guidance for Pollution Prevention (GPP) that are available on the NetRegs website (Northern Ireland Environment Agency and Scottish Environment Protection Agency, 2020; NetRegs, 2020) would be applied. While these are not regulatory guidance in England, they remain a useful resource for best practice.<br><br>Methods to deal with pollutant risk will be reviewed and adapted as construction works progress in response to different activities, weather conditions, and work locations.<br><br>For new bridges and crossings for the Connection Corridors and access, water will be over-pumped through the works; works will be undertaken in drier periods of the year, as far as reasonably practicable; pump intakes will be appropriately screened to prevent fish being drawn into the pipe/ pump; and drainage and planting to be reinstated following completion of works. | watercourses), the Canal and River Trust (for any works associated with the canal) and the MMO (due to works impacting the tidal River Trent) for works affecting, or for temporary discharges to, waterbodies during the construction period.<br><br>The programme is expected to include a combination of daily observations and monitoring using a calibrated, handheld water quality probe through the upstream and downstream reaches of water features hydrologically-connected to the Site. It is expected that water quality sampling will be undertaken on a periodic as well as ad-hoc basis, dependent upon circumstances/ activities onsite. Monitoring and sampling will be undertaken prior to the | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | **Pollution Plans**<br>• plans to deal with accidental pollution will be included within the final CEMP prior to commencement of construction;<br>• during construction, water pollution may occur directly from spillages of polluting substances into waterbodies, or indirectly by being conveyed in runoff from hard standing, other sealed surfaces or from construction machinery. Fine sediment may also be disturbed in waterbodies directly or also wash off working areas and hard standing (including approach roads) into waterbodies indirectly via existing drainage systems or overland. This sediment may potentially contain contaminants ~~that~~ and could be harmful to the aquatic environment. Plans to avoid, prevent and reduce adverse effects on the water environment and deal with any accidental pollution will be included within the final CEMP;<br>• construction works undertaken adjacent to, beneath and within watercourses will comply with relevant guidance during construction, including the requirements of any Environmental Permit, Ordinary Watercourse Consent and/ or Environment Agency GPP and IDB Bylaws, particularly AN01, AN02, AN03, AN05 and AN06.<br><br>Pollution prevention measures considered would include (but | commencement of construction as to allow a sufficient baseline data. | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | not be limited to):<br>• the design of oil interceptors shall be undertaken based on manufacturer supplied information;<br>• foul flows and effluent arising from the Proposed Development operation will be kept separate from the surface drainage network;<br>• areas which may have a higher risk of pollutant spills to be isolated through the use of bunds; and<br>• during construction, the Contractor will adhere to all relevant pollution prevention guidelines and measures in this Framework CEMP.<br><br>**Discharge/ Disposal of Site Runoff**<br>The measures to manage fine sediment in surface water runoff as a result of construction activities are outlined included in the below and will be developed with further detail in the WMP (to accompany the Final CEMP). There are a wide range of measures that can be adopted by the Contractor(s) to reduce the risk of excessive fine sediment in runoff (timing of works, minimising earthworks and seeding or covering them), to intercept runoff to prevent uncontrolled runoff from the Proposed Development Site (e.g. by using cut off drains, fabric silt fences, bunds and straw bales, designated areas for cleaning plant and equipment, wheel washes and road sweepers), and to treat runoff to remove excessive levels of fine sediment (e.g. settlement lagoons, sumps, spraying on to land | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | or even proprietary measures such as lamella clarifiers). It will be for the Contractor(s) to continually monitor the need for measures depending on the nature of the works being undertaken the weather conditions, and the performance of sustainable drainage systems installed.<br>• where necessary, suitable measures will be put in place to prevent sediment being washed off-site, and the stockpiles will be visually monitored for wash away during and after periods of prolonged rainfall;<br>• where required, laydown areas will be levelled to provide an even surface and underlain by semi-permeable surfacing, to allow surface water and rainwater to percolate through;<br>• reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing waterbody during construction taking into account relevant industry guidelines including CIRIA report 'C532: Control of water pollution from construction sites'. This may typically (CIRIA, 2001) include use and maintenance of temporary lagoons, tanks, seeding/ covering of earth stockpiles, earth bunds, straw bales and sandbag walls, other proprietary measures, fabric silt fences or silt screens and consideration of the type of plant used;<br>• a temporary drainage system will be developed to prevent runoff contaminated with fine particulates from entering surface water drains without treatment. This will cover all | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | land drains and waterbodies within the Proposed Development Site that could be affected, taking measures to adequately protects using e.g. drain covers, sand bags, earth bunds, geotextile silt fences, straw bales, or proprietary treatment. Any discharge to waterbodies (directly or indirectly) will only be made with the consent of the Environment Agency (or relevant statutory undertaker, if to the public foul sewer, or the Canal and River Trust if to the canal) and with any agreed treatment measures implemented;<br>• where reasonably practicable, earth moving works will seek to avoid periods of very wet weather, to minimise the risk of generating runoff contaminated with fine particulates. Where this is not reasonably practicable, mitigation measures will be implemented to control fine sediment laden runoff;<br>• to protect waterbodies from fine sediment runoff, topsoil/ subsoil will be stored a minimum of 20m from watercourses on flat lying land (and further where any ground is sloping. Where this is not reasonably practicable and material is to be stockpiled for longer than two weeks, material will either be covered with geotextile mats or seeded to promote vegetation growth, with runoff from the stockpile prevented from draining to any watercourses, without prior treatment;<br>• appropriately sized runoff storage areas for the settlement of fine particulates in runoff will be provided. It is anticipated | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | that treated water may be pumped under a temporary Water Activity Permit from the Environment Agency or agreed with the statutory undertaker (Severn Trent Water) to an existing WwTW;<br>• mud deposits will be controlled, as far as reasonably practicable, at entry and exit points to the Proposed Development Site using wheel washing facilities and/ or road sweepers operating during earthworks activities or other times as considered necessary;<br>• equipment and plant will be washed out and cleaned in designated areas within the Proposed Development Site compound where runoff can be isolated for treatment before discharge to under appropriate consent and/ or agreement with Environment Agency, Isle of Axholme and North Nottinghamshire Water Level Management Board ('the IDB') and/ or statutory undertaker, or otherwise removed from the Proposed Development Site for appropriate disposal at a licensed waste facility; and<br>• debris and other material will be prevented from entering surface water drainage, through maintenance of a clean and tidy site, provision of clearly labelled waste receptacles, grid covers and the presence of site security fencing.<br><br>**Management of Spillage** | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | The measures outlined below will be implemented to manage the risk of accidental spillages and potential conveyance to nearby waterbodies via surface runoff or land drains. The measures relating to the control of spillages and leaks are summarised below and will be included in the WMP in the final CEMP and adopted during the construction works. Measures will be in accordance with prevailing pollution prevention legislation and following best practice guidance summarised earlier. They will include details of how fuel and other chemicals (including cement) will be stored, used on site, and equipment and plant cleaned, as well as how leaks and spillages will be prevented or remediated if needed. This will also include the implementation of a Pollution Prevention Plan and an Emergency Response Plan.<br><br>In addition, site welfare facilities will be appropriately managed, and all foul waste disposed of by either to the existing Keadby 2 Power Station foul connection, or for the laydown areas south of the Stainforth and Keadby Canal, via a licensed waste contractor to a suitably permitted facility.<br><br>• any liquid fuel will be stored and used in accordance with the Control of Substances Hazardous to Health Regulations 2002 (UK Government, 2002), and the Control of Pollution (Oil Storage) (England) Regulations 2001 (UK Government, 2001). | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | • particular care will be taken with the delivery and use of concrete and cement as it is highly corrosive and alkaline.<br>• fuel and other potentially polluting chemicals will either be in self bunded leak proof containers or stored in a secure impermeable and bunded area (minimum capacity of 110% of the capacity of the containers). No hazardous materials would be stored unbunded within the construction laydown areas. All construction laydown areas would be secured by security fencing and gates as appropriate;<br>• any plant, machinery or vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off site if possible or only at designated areas within the Proposed Development Site compound. Only construction equipment and vehicles free of all oil/ fuel leaks will be permitted on site. Drip trays will be placed below static mechanical plant.<br>• all washing down of vehicles and equipment will take place in designated areas and wash water will be prevented from passing untreated into watercourses.<br>• all refueling, oiling and greasing will take place above drip trays or on a bunded~~n~~ impermeable surface which provides protection to underground strata and watercourses, and away from drains as far as reasonably practicable. Vehicles will not be left unattended during refueling. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | • as far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in or over watercourses.<br>• all fixed plant used on the Proposed Development Site will be self-bunded.<br>• mobile plant is to be in good working order with drip trays installed beneath oil tanks/ engines/ gearboxes and hydraulics, which would be checked and emptied regularly.<br>• plans to deal with accidental pollution would be included within the CEMP prior to commencement of construction and any necessary equipment (e.g. spillage kits) would be held on site and all site personnel would be trained in their use. The Environment Agency would be informed immediately in the unlikely event of a suspected pollution incident.<br>• the Proposed Development Site will be secure to prevent any vandalism that could lead to a pollution incident;<br>• construction waste/ debris will be prevented from entering any surface water drainage or water body; and<br>• suitable facilities for concrete wash water (e.g. geotextile wrapped sealed skip, container or earth bunded area) will be adequately contained, prevented from entering any drain, and removed from the Proposed Development Site for appropriate disposal at a suitably permitted waste facility. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | **Cofferdam works**<br>Installation of any cofferdam in the Stainforth and Keadby Canal would require permission from the Environment Agency and CRT. Any cofferdam within the River Trent would require a Marine Licence from the MMO; a draft 'Deemed' Marine Licence has been subject to MMO review and is provided with the Draft Development Consent Order (**Application Document Ref. 2.1**). Maintaining a dry working area for any in-channel working using a cofferdam will reduce the overall channel disturbance and potential for mobilising fine sediment (and any contamination) into the water column and estuary /canal.<br><br>Any cofferdam works will be undertaken with due regard to the Eels (England and Wales) Regulations 2009 (UK Government, 2009), which may require installation of an eel screen. A fish rescue will be required from the cofferdam before pumping out of water. All works will be undertaken in accordance with a Fish Management Plan.<br><br>A dry working area will be maintained for any in-channel working using a cofferdam.<br><br>The cofferdam will be designed to minimise changes to the estuary or canal bed and bank erosion and toe scour by extending the minimum distance possible into the channel. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | Pre-construction sediment contamination testing will be undertaken, and silt curtains used to minimise impacts on water quality.<br><br>Dewatering within the cofferdam area will be undertaken once any fine sediment has settled out such that it is consistent with the turbidity of the flowing River Trent and following any necessary fish rescue. The rate and location of the discharge will be controlled and carefully chosen to avoid further erosion of any nearby soft sediments.<br><br>Whilst in-situ, the cofferdam will be regularly inspected and maintenance undertaken, where required, and any water entering the cofferdam area via seepage will be disposed of appropriately (i.e. by pumping back into the waterbody).<br><br>**Water supply connection corridors**<br>Where open cut crossings of minor drains within the Proposed PCC Site are required (e.g. for Drain 2) to accommodate the water supply connection corridors (from either option), it is assumed that flow may be temporarily over-pumped, diverted around or flumed through the working area and the watercourse fully reinstated following completion of works.<br><br>Measures to reduce the potential adverse impacts considered will include: | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | • implementation of a temporary site drainage system;<br>• undertaking works in the typically drier periods of the year, where reasonably practicable;<br>• completing a pre-works survey to record waterbody form and condition prior to works commencing;<br>• any required pump intakes will be appropriately screened to prevent fish being drawn into the pipe/ pump;<br>• no plant will track through any channel where works are undertaken and will be confined to the banks;<br>• crossings will be perpendicular to the channel where reasonably practicable;<br>• measures to control effects relating to bed substrate will also be developed including careful storage of sediment layers to enable typical pre-construction habitats and hydromorphological processes to quickly re-establish following the works.<br><br>**Land Drainage**<br>Appropriate measures to minimise short-term and long-term impacts on land drainage will be agreed with the relevant landowner for those works affecting drains within the temporary construction and laydown areas (**Work No. 9A** and refer to **Chapter 5**: Construction Programme and Management (ES Volume I - **Application Document Ref. 6.2**) for further details). Where land drains are under the control of the IDB, relevant bylaws will be adhered to or consent | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | obtained for works affecting/ crossing drains within the Electrical Connection to the Northern Powergrid Substation (**Work No. 3A**), Water Discharge Corridor (**Work No. 5**) and emergency vehicle access route (**Work No. 8B**). These measures will be secured in the Final CEMP. In addition, the following will be discussed and agreed with the IDB, included in the detailed design and secured via the Final CEMP:<br>• Agreement on the exact cable routing and depth proposed (which shall be a minimum depth of 1.5m below hard bed level and installed using HDD) for the 132kV cable to cross either Keadby Common Drain and Glew Drain or to cross the Power Station Drain;<br>• Agreement on the management of potential conflicts between the use of the temporary laydown area adjacent to Glew Drain and the IDB maintenance operations on the Drain from the north side of the watercourse;<br>• Agreement on the approach to management of surface water discharge into Glew Drain in accordance with IDB Policy; and<br>• Ensure that fencing and boundary treatments (including planting) respect the 9m byelaw distance from the drainage network.<br><br>**Management of Flood Risk** | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | The Contractor will monitor weather forecasts on a daily basis and plan works accordingly. For example, works in the channel of any watercourse will be avoided or halted where there to be a risk of high flows or even flooding. In addition, the Contractor will sign up to Environment Agency flood warning alerts and describe in the Emergency Response Plan the actions to be taken in the event of a possible flood event to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding.<br><br>Safe egress and exits will be maintained at all times when working in excavations. When working in excavations a banksman will be present at all times.<br><br>Measures to prevent an increase in flood risk during construction works will include:<br>• adequate containment of storage areas, to ensure that material does not wash away and cause pollution and damage to infrastructure;<br>• the construction laydown area site office and supervisor will be notified of any potential flood occurring by use of the 'Floodline Warnings Direct' service;<br>• the Contractor will be required to produce a Flood Risk Management Action Plan/ Method Statement which will | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | provide details of the response to an impending flood and include:<br>○ a 24 hour availability and ability to mobilise staff in the event of a flood warning;<br>○ construction works would not take place during times of high flow when there is a Flood Alert;<br>○ ensure that flood warnings are received from the Environment Agency's 'Floodline Warnings Direct' service to inform if there is a risk of flooding from a tidal storm surge type event which could result in overtopping or breach of defences;<br>○ the removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period;<br>○ details of the evacuation and site closedown procedures; and<br>○ arrangements for removing any potentially hazardous material and anything capable of becoming entrained in floodwaters, from the temporary works area.<br><br>Due to the residual risk to construction personnel and equipment resulting from a breach of defences on the River Trent, construction works should not take place during times of high flow when there is a Flood Alert. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | A Flood Emergency Response Plan will be developed for the Proposed Development. This will link closely with the wider Keadby Power Station Site emergency response plans and management system procedures to ensure the residual risk is mitigated and managed over the lifetime of the Proposed Development. This will include the recommendation of at least one designated Flood Warden to be appointed for the Proposed Development Site who is familiar with the risks and remains vigilant to news reports, Environment Agency flood warnings and water levels in the River Trent.<br><br>Safe access and egress routes will be maintained.<br><br>Construction works would not take place during times of high flow when there is a Flood Alert.<br><br>If water is encountered during below ground construction, suitable de-watering methods will be used.<br><br>Should the Proposed Development comprise below ground development within strata where groundwater is recorded as present, mitigation measures, including some of those outlined in British Standard 8102 (BS8102) will be required to reduce the risk of groundwater flooding to underground structures as is best practice. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | **Navigational Risk**<br>The Navigational Risk Assessment (**Appendix 12C**, ES Volume II - **Application Document Ref. 6.3**) identifies measures to mitigate against navigational risks associated with the Canal and River Water Abstraction Options. In summary, these measures will include:<br>• continued engagement with the Canal and River Trust, ABP Humber and PD Ports (as appropriate) to help inform any planned programme for works at the abstraction points;<br>• notices to Mariners/ local Canal Notices will be issued in order to ensure that mariners are aware of the cofferdam and planned activities;<br>• appropriate hazard warning, screening, lighting and signage will be installed, as required (for the Stainforth and Keadby Canal this is predicted to be comparable to the recently constructed intake for Keadby 2 Power Station);<br>• should the River Water Abstraction Option be required, engagement with the relevant authorities will be undertaken to help inform any planned programme for works, make use of local working knowledge and minimise risks to other mariners within the River Trent;<br>• if marine works are required, an appropriate application will be made to the ABP Humber harbour master, as the | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
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| | appropriate Navigational Authority, in order to obtain 'port approval' for works;<br>• if marine works are required, navigational safety will be appropriately addressed within the design and build contractor specification. Contractor proposals will be reviewed by appropriately qualified and experienced marine personnel;<br>• engagement with Trinity House and MCA will be undertaken to inform the lighting and/ or marking requirements for the works.<br>• the final CEMP is to be secured through the Deemed Marine Licence; this will provide relevant stakeholders, such as the MMO, the opportunity to review the measures proposed for the effective management of construction risks;<br>• in accordance with the requirements of the DML, all vessel masters would be provided the DML to provide information on key conditions of relevance to navigational risk.<br><br>AIL Movements:<br>• engagement with ABP Humber, PD Ports and, where required due to planned closures of Keadby Lock, CRT would be undertaken to help inform the planned use of Railway Wharf; including use of local working knowledge to inform the timing and delivery of works and thereby | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | minimise risks to other mariners within the River Trent and the Stainforth and Keadby Canal, where this is relevant;<br>• ABP Humber, as the appropriate Navigation Authority, has been consulted on the draft DML (**Application Document Ref. 2.1**), a previously described, providing opportunity to review the proposed conditions;<br>• navigational safety will be considered within the heavy lift contractor specification. Contractor proposals would be reviewed by appropriately qualified and experienced marine personnel;<br>• prior to commencement of AIL deliveries, it is anticipated that ABP Humber would attend site with the heavy lift contractor, once appointed, in order to review access arrangements, moorings and agree the final approach;<br>• notices to Mariners will be prepared and requested for issue by the appropriate Navigational Authority in order to ensure that mariners are aware of the planned activities;<br>• in accordance with the requirements of the DML, all vessel masters would be provided the DML to provide information of conditions of relevance to navigational risk; and<br>• consistent with Keadby 2 Power Station AIL deliveries, it is anticipated that any preparatory levelling would be undertaken by the Navigational Authority (i.e. to provide a safe and stable NAABSA berthing pocket);<br>• it is anticipated that the appropriate Navigational Authority would mandate pilotage and/ or use of supporting tug boats | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | and support craft. This would further ensure minimisation of risk on docking;<br>• in terms of distraction, the Notice to Mariners will raise awareness of vessel deliveries to help reduce this risk. Where task lighting is required, light spill will be minimised as far as reasonably practicable in accordance with the Lighting Strategy (**Application Document Ref. 5.11**);<br>• it is anticipated that some AIL deliveries may require the temporary closure of Keadby Lock. This will minimise risks to mariners using the Stainforth and Keadby Canal ;<br>• notices to Mariners ('Notices and Stoppages') will be requested through CRT to provide forewarning to mariners of closures;<br>• building upon lessons-learned from Keadby 2 Power Station, a shipping movement schedule will be maintained by the Applicant, in collaboration with the heavy lift contractor, once appointed providing information on the timing and nature of loads arriving; and<br>• a Notice to Mariners condition would be adopted within the DML and issued via ABP Humber as the appropriate Navigational Authority; this would ensure that mariners are made aware of works such that they can plan their passage past works based on a local, up-to-date account of hazards.<br><br>**Below Ground Construction** | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | If water is encountered during below ground construction, suitable de-watering methods will be used. Any significant groundwater dewatering required will be undertaken in line with the requirements of the Environment Agency under the Water Resources Act 1991 as amended (HMSO, 1991) and Environmental Permitting (England and Wales) Regulations 2016 (HMSO, 2016).<br><br>All works will comply with the safety clearances and requirements set out by the utility providers who have assets within the Proposed Development Site.<br><br>**Mabey Bridge Replacement and Emergency Access Bridge over Drain 1**<br>There may be a requirement for minor works to watercourse crossings relating to the temporary access roads for strengthening, maintenance or minor improvements. This could potentially impact Drain 6, Drain 7a, and Drain 7b. Any such work would again require the consent of IoAaNNWLMB and be subject to their bylaws.<br><br>A Flood Risk Activity Permit will be required for works at the replacement Mabey Bridge. Refer to **Application Document Ref. 4.16** which provides an indicative construction sequence and indicates laydown areas. | | |

**Table 9: Cultural Heritage**

| Potential Impact | Mitigation/Enhancement Measure | Monitoring/Additional Survey Requirements | Responsibility |
|---|---|---|---|
| Partial or total removal of heritage assets.<br><br>Compaction of archaeological deposits by construction traffic and structures.<br><br>Changes to local hydrology that could dry out underlying peat deposits and effect preservation levels of heritage assets.<br><br>Vibration effects during construction and/ or operation of the Proposed Development. | The following impact avoidance/ mitigation measures will be followed:<br>• where feasible, archaeological assets which will experience significant adverse effects arising from the construction of the Proposed Development should be preserved in situ. This will involve sensitive design measures (embedded mitigation) to avoid areas of significant archaeological potential;<br>• where it is not reasonably practicable to apply design mitigation to the management of the archaeological resource, additional mitigation measures may be applied;<br>• a further stage of archaeological evaluation will likely be required and set out as a requirement of the DCO (**Application Document Ref. 2.1**). This could comprise further geoarchaeological assessment and trial trench evaluation. The results of the further stages of archaeological evaluation will inform the scope of any mitigation requirements, which may comprise archaeological monitoring of construction activities and detailed excavation;<br>the steps and safety procedures outlined within the Outline Written Scheme of Archaeological Investigation | The Outline Written Scheme of Archaeological Investigation (OWSI) provided as **Application Document Ref 7.4** will be agreed with Historic England and NLC. Once agreed, this document would establish the objectives for the historic environment works and set out the mechanisms for the appointed archaeological contractor to design the investigation, undertake evaluation, analysis, reporting and deposit the archive prior to construction.<br><br>A further stage of archaeological evaluation is likely to be required and set out as a requirement of the draft DCO (**Application Document Ref. 2.1**). | Refer to the OWSI provided for responsibilities (**Application Document Ref 7.4**). To be confirmed in final CEMP. |

| Potential Impact | Mitigation/Enhancement Measure | Monitoring/Additional Survey Requirements | Responsibility |
|---|---|---|---|
| Adverse effects on the setting of heritage assets as a result of, for example visual intrusion, noise, severance, access and amenity. | (OWSI) (**Application Document Ref 7.4**) will be finalised and detailed within the final CEMP. | | |

**Table 10: Climate Change and Sustainability**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| Greenhouse gas emissions. In-combination climate change impact. | **GHG Emissions**<br>The final CEMP will consider:<br>• fuel consumption on site in vehicles, equipment and plant;<br>• minimisation of vehicle and plant idling;<br>• energy consumption;<br>• water consumption in the onsite amenity blocks;<br>• water consumption from the construction process (including dampening down as part of dust mitigation);<br>• transportation of materials to the site;<br>• waste disposal (by method i.e. landfill, recycling etc.) and transportation from construction activities;<br>• specification of construction materials to lower embodied carbon emissions i.e. higher recycled content;<br>• the Applicant will seek to maximise sustainable transport options such as public transport (including rail), cycling and car sharing in accordance with policy;<br>• where possible, avoiding routing connections through habitat. Where impacts cannot be avoided, landscape management and enhancement proposals will be developed to ensure replacement planting and overall biodiversity net gain; and | To be confirmed in final CEMP. | To be confirmed in final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | The management of GHG emissions and the application of mitigation measures during construction will be secured through the Final CEMP. | | |

**Table 11: Socio-economics**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| Employment opportunities will be created as a result of the works.<br><br>Displacement leading to reduction of output or employment outside of the Proposed Development.<br><br>Increase in local employment arising from indirect and induced effects of the construction activity.<br><br>Increased local demand for accommodation during the construction period which could lead to | Due to the size and nature of the Proposed Development, it is anticipated that additional skills and education programmes and events will be provided by the Contractor(s)s as mitigation.<br><br>A mechanism for managing stakeholders' questions, concerns, and grievances and provide appropriate conflict resolution processes could be considered to ensure any issues are heard by the developer. | None | To be confirmed in the Final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| an increase in local rent costs. | | | |

**Table 12: Major Accidents and Disasters**

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| Fire/ explosion and risk of release of harmful gas.<br>Spillage/ leak of chemicals or pollutants into groundwater/ surface water.<br>Extreme weather (e.g. flooding, drought).<br>Vandalism (trespass)/ terrorism.<br>Ground collapse.<br>Major road traffic accident.<br>Release of asbestos.<br>Aircraft/ drone impact.<br>Pandemic.<br>Domino effects from impacts at neighbouring facilities.<br>Drowning. | Consultation with appropriate stakeholders such as National Grid Gas and the Environment Agency will be undertaken to manage interfaces and define appropriate control measures.<br><br>A final CEMP will be in place to control potential environmental impacts of construction works. Control measures will be implemented to prevent fires and procedures will be prepared and implemented to respond to fires, in the event that they were to arise.<br><br>To reduce risks associated with ground instability, there will be use of industry standard construction methods/ design features appropriate to the context of the Proposed Development Site.<br><br>A watching brief will be adopted during the construction works and an asbestos management plan developed as part of the final CEMP. If identified, risks will be managed to ensure legal compliance through the Control of Asbestos Regulations 2012 (HM Government, 2012) governing the handling and disposal of ACM.<br><br>Consultation with relevant airports/ Civil Aviation Authority (CAA) to manage interfaces and define appropriate control | To be confirmed in the Final CEMP. | To be confirmed in the Final CEMP. |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | measures including aviation warning lighting and lighting to be fitted to tall construction machinery that exceeds relevant limits has been undertaken and lighting is proposed to be secured via a requirement of the draft DCO (**Application Document Ref. 2.1**). The final CEMP will include vigilance and security systems to safely shutdown the plant in the event of any aircraft related incident.<br><br>If an influenza pandemic was to disrupt the construction of the Proposed Development, measures would be adopted taking into account experience at the Keadby 2 Power Station project in which the Covid-19 pandemic required construction works to temporarily cease.<br><br>Preliminary risk assessment has informed the inclusion of an exclusion zone for the siting of built infrastructure associated with the Proposed Development to mitigate the risks related to the presence of wind turbines in closer proximity to the Site boundary. During detailed design, the contractor will engage with the windfarm operator (SSE Renewables) to inform the need for/ size of any similar exclusion zones for construction.<br><br>The Applicant will engage with PD Ports Services Keadby to confirm the withdrawn status of this HSC and presence of any new hazardous substances stored on site, prior to construction. | | |

| Potential Impact | Mitigation/ Enhancement Measure | Monitoring/ Additional Survey Requirements | Responsibility |
|---|---|---|---|
| | In preparing the notification for any COMAH licence application, which would be undertaken prior to construction, the emergency plan will consider HSG 191 Guidance (HSE, 2009) 'Emergency Planning for Major Accidents' which requires consideration of the potential for domino effects. and that operators involved 'exchange any information necessary'. . This will inform the locations of hazardous sites/ assets and the mitigation required. | | |

## 3.2 Implementation and Operation

3.2.1 The final CEMP will set out all roles, responsibilities and actions required in respect of implementation of the measures described in this Framework CEMP, including:

- an organogram showing team roles, names and responsibilities;
- training requirements for relevant personnel on environmental topics;
- information on site briefings and toolbox talks that will be used to equip relevant staff with the necessary level of knowledge to follow environmental control procedures;
- measures to advise employees of changing circumstances as work progresses;
- communication methods (e.g. updates via the Applicant's website);
- document control; and
- environmental emergency procedures.

3.2.2 All construction works associated with the authorised development must be carried out in accordance with the approved construction environmental management plan unless otherwise agreed with the relevant planning authority.

## 3.3 Checking and Corrective Action

Monitoring

3.3.1 Environmental monitoring of impacts will be undertaken throughout the construction phase. In addition to any monitoring specified in other licences and consents (e.g. under Protected Species Licensing if required), the requirements of the CEMP specified in **Tables 2-11** will be closely monitored.

3.3.2 As part of the monitoring process, the appointed contractor will allocate a designated Environmental Site Officer(s), who would be present on-site throughout the construction, including when new activities are commencing. The Environmental Site Officer will observe site activities and report any deviations from the final CEMP in a log book, along with the action taken and general conditions at the time. The Applicant will be informed of any deviations from the final CEMP as soon as possible following identification of such issues. The Environmental Site Officer will also assist the Applicant with day-to-day contact with NLC, and other regulatory agencies such as the Environment Agency.

3.3.3 During construction, the Environmental Site Officer will conduct regular walkover surveys to ensure all requirements of the final CEMP are being met. Action from these surveys will be documented on an Environmental Action Schedule, discussed with the Site Foreman for programming requirements and issued weekly for actioning.

3.3.4 The Environmental Site Officer will arrange regular formal inspections to ensure the requirements of the final CEMP are being met. After completion of the works, the Environmental Site Officer will conduct a final review.

Records

3.3.5 The Environmental Site Officer will retain records of environmental monitoring and implementation of the final CEMP. This will allow provision of evidence that the final CEMP is being implemented effectively. These records will include:

- an Environmental Action Schedule;
- records of licences, permits and approvals;
- results of inspections;
- other environmental surveys and investigations; and
- environmental equipment test records.

3.3.6 The final CEMP will be a live document and as such updated regularly, with a full review on at least a quarterly basis throughout construction.

## 3.4 Management Review

3.4.1 The final CEMP will be signed off on completion of the construction works. The operator of the Proposed Development Site will then implement and maintain an Environment Management System (EMS)

## 4.0 REFERENCES

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UK Government (2002) Control of Substances Hazardous to Health Regulations 2002 (SI 2002 No. 2677).

UK Government (2009) Eels (England and Wales) Regulations 2009 (SI 2009 No. 3344). Available online: https://www.legislation.gov.uk/uksi/2009/3344/contents/made

# APPENDIX A FRAMEWORK SITE WASTE MANAGEMENT PLAN (SWMP)

## A.1 Introduction

A.1.1 This Framework Site Waste Management Plan (SWMP) provides an outline waste management strategy for the construction phase, considering likely waste arising from construction based activities such as earthworks, and addresses how these would be managed through application of the principles of the waste hierarchy as identified within the Waste Framework Directive (European Commission, 2008). Plate A.1 shows the waste hierarchy.

**Plate A.1: The Waste Hierarchy**


A.1.2 This Framework SWMP does not replace the requirement for the completion of a construction stage SWMP. The Framework SWMP presents the approach that would be adopted as a minimum throughout construction and forms a framework for the approach of the construction stage SWMP.

## A.2 Waste Management Legislation and Policy Context

Legislative Background

A.2.1 Relevant waste legislation would be complied with during construction. Waste legislation (principally originating from European Directives) includes (but is not limited to) those listed below:

- Control of Pollution (Amendment) Act 1989 (HM Government, 1989);
- Environmental Protection Act 1990 (HM Government, 1990);

- Environmental Protection (Duty of Care) Regulations 1991 (HM Government, 1991);
- Controlled Waste Regulations 2012 (HM Government, 2012);
- Environment Act 1995 (HM Government, 1995);
- The Hazardous Waste (England and Wales) Regulations 2005 (HM Government, 2005);
- The Environmental Permitting (England and Wales) Regulations 2016 (HM Government, 2016);
- Site Waste Management Regulations 2008 (HM Government, 2008);
- The Environmental Damage (Prevention and Remediation) Regulations 2015 (HM Government, 2015); and
- The Waste (England and Wales) Regulations 2011 (as amended) (HM Government, 2011).

A.2.2 The Waste (England and Wales) Regulations 2011 (as amended) set the legal basis for the 'Duty of Care' for the management of waste in England and Wales.

A.2.3 (Note that this list includes base legislative references only – a number of regulations have also been amended).

National Planning Policy

A.2.4 In England, waste management strategies and principles are set out in a number of documents:

- Waste Strategy 2000 (subsequently built upon by the Waste Strategy for England (Department for Environment, Food and Rural Affairs, 2007) introduced new underlying principles of sustainable waste management, some key aspects of which are outlined in **Table A.1.**
- National Planning Policy Framework (NPPF) 2019 (Department for Communities and Local Government, 2019) sets out the Government's objectives in order to help achieve sustainable development. The framework does not include specific waste policies. Rather, these have been published as part of the National Waste Management Plan for England (Department for Environment, Food and Rural Affairs, 2021).
- the Overarching National Policy Statement for Energy (EN-1) outlines that the applicant should prepare a SWMP and provides guidance on sustainable waste management techniques; and
- the National Planning Policy for Waste (NPPW) (Department for Communities and Local Government, 2014) provides guidance of relevance to the Proposed Development in outlining that it is the responsibility of the local planning authority to ensure that non-waste related development does not impact on existing waste management facilities and does not prejudice

implementation of the waste hierarchy or the efficient operation of such facilities. Similarly, there is a requirement that new, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development. NPPW requires the handling of waste arising from the construction such that a development maximises reuse/recovery opportunities and minimises off-site disposal.

A.2.5 Taking this into account, the arrangements described and defined within the SWMP should include information on the proposed waste recovery and disposal system for all waste generated by the Proposed Development, and an assessment of the impact of the waste arising from the Proposed Development on the capacity of waste management facilities to deal with other waste arising in the area.

A.2.6 The appointed contractor should seek to minimise the volume of waste produced and the volume of waste sent for disposal.

A.2.7 The appointed contractor should propose an effective system for managing hazardous and non-hazardous waste arising during construction.

A.2.8 The appointed contractor should demonstrate:

- any such waste would be properly managed, both on-site and off-site;
- the waste can be dealt with appropriately by the waste infrastructure which is, or is likely to be, available. Such waste arisings should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area; and
- adequate steps have been taken to minimise the volume of waste arisings, and of the volume of waste arisings sent to disposal, except where that is the best overall environmental outcome.

**Table A.1: Principles of Waste Management – Definitions**

| Principal | Description |
|---|---|
| Waste Hierarchy | A theoretical framework used as a guide to the waste management options that should be considered when assessing BAT. |
| Waste as a Resource | Certain wastes can be directly used or separated/ processed for use as a replacement for raw materials, saving resources and potentially reducing energy use or other impacts associated with virgin resource extraction and transport.<br>Where materials have been identified for beneficial use (i.e. not as 'waste') within the site or at another site, they must be managed using the CL:AIRE Definition of Waste Code of Practice (DoW CoP), which requires the development of a Materials |

| Principal | Description |
|---|---|
| | Management Plan (MMP) that defines how the materials are to be managed following satisfactorily being pre-assessed. |
| Proximity Principle | Waste should generally be managed as close as possible to its place of production, to minimise environmental impact that arises through transportation. |
| Best Practicable Environmental Option (BPEO)<br>(Superseded by Strategic Environmental Assessment (SEA)/ Sustainability Appraisal (SA)) | Defined by the Royal Commission on Environmental Pollution (1988) as '*the outcome of a systematic and consultative decision making procedure which emphasises the protection and conservation of the environment across land, air and water'*. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits, as a whole, at acceptable cost, in both the short-term and the long-term.<br>SA is designed to ensure compliance with SEA and as such includes for requirements on environmental decision making such as an opportunity for the public to express their opinion on draft plans (community involvement), take into account significant environmental effects including those on human health, material assets and climatic factors and a full assessment of alternative options and reasons why alternatives have been assessed and why others have not. |

Policy Relating to Specific Waste Types

A.2.9 In regard to Construction, Demolition and Excavation (CD&E) Waste, the EU Waste Framework Directive (European Commission, 2008) has set a recovery target of 70% of construction and demolition waste by 2020.

Local Planning Policy

A.2.10 NLC is the waste disposal authority for the Site. NLC's waste hierarchy provided within the North Lincolnshire Waste Strategy (NLC, 2012) gives priority to preventing waste and if waste is created priority is then given to reuse, then recycling, then recovery and lastly disposal.

Approach to Waste Management

A.2.11 The Applicant is committed to delivering a development that is sustainable in regard to matters relating to waste management and will comply with the relevant statutory requirements (as detailed above), which are underpinned at

a national level by the NPPW. This requirement will be passed onto the contractor.

A.2.12 Waste elimination will start as early as possible and the contractor and their design team will work in conjunction with the Applicant to design and plan waste minimisation.

A.2.13 In addition, an effective construction phase SWMP will be prepared which will identify, formalise and communicate waste management good site practice and responsibilities during the construction.

A.2.14 The proposed construction phase SWMP will identify the types and quantities of waste anticipated to be generated, along with the definition of suitable disposal routes. The construction phase SWMP will also include details as to how material reuse and recycling options will be maximised. The construction phase SWMP will be maintained as a live document, to be updated and monitored by the contractor, in order to demonstrate compliance with the Waste Duty of Care and other relevant regulations.

A.2.15 The SWMP will require that the contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All waste removal from the Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

Waste Types and Actions

A.2.16 It is anticipated that up to 65,000m$^3$ of soils may need to be removed as part of the provision of a suitable platform for foundations and buildings/ equipment across the Proposed PCC Site. These materials would be removed from/ delivered to the Proposed Development Site via HGV using the access from the A18.

A.2.17 Any excess spoil generated during construction will be managed through the SWMP that would form part of the final CEMP. Spoil which cannot be re-used will be removed from site for re-use, treatment or disposal at a permitted facility. The re-use of excavated materials during construction will be governed by either a Materials Management Plan developed in accordance with relevant guidance including 'The Definition of Waste: Development Industry Code of Practice' (CL:AIRE, 2011), an environmental permit or a relevant exemption.

A.2.18 A further source of construction waste would relate to packaging waste associated with materials used during construction.

A.2.19 Although, at this stage it is not possible to confirm the anticipated type and estimated volumes of waste to be produced from construction; **Table A.2** provides a summary of the anticipated waste types and how each waste type is expected to be managed to reduce adverse impacts.

**Table A.2: Waste Types and Management**

| Waste Type | Main Management Process |
|---|---|
| Soil arisings | Reuse on-site where appropriate, remediate where necessary. |
| Concrete, masonry and aggregates | Crush and reuse, investigate potential for off-site use. |
| Metals | Recycle via appropriate waste carrier. |
| Paper and cardboard | Segregate and recycle via appropriate waste carrier. |
| Sanitary waste | Remove by specialist waste contractor. |
| Plastics and glass | Recycle via appropriate waste carrier. |

Waste Minimisation Actions and Mitigation

A.2.20 Waste minimisation actions relating to site generated construction waste will include consideration of:

- agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- implementation of a 'just-in-time' material delivery system, as far as reasonably practical, to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- re-use of materials wherever feasible;
- segregation of waste at source where practical; and
- re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).

Additional Actions for Dealing with Waste

A.2.21 In addition to the waste management measures as detailed in the 'Approach to Waste Management' section above, there are actions that will be introduced as part of the construction SWMP which would contribute to the general reduction of waste generation during construction, including:

- appointment of an Environmental Site Officer who will hold overall responsibility for waste management, coordinate all waste and environmental issues on-site, monitor waste data and identify training needs. Sites with such personnel tend to perform better in managing waste;

- accurate record keeping of waste types, volumes and disposal routes and destinations;
- staff awareness training to ensure all personnel know the correct procedures on-site for waste segregation, disposal and actively promote recycling on-site through clear signage;
- setting of targets/ Key Performance Indicators (KPIs) for waste recycling and reduction; and
- establishing a good management structure, which will allow prompt decision making relating to improvements in waste management and recycling initiatives.

Indicative Roles and Responsibilities

A.2.22 Personnel at all levels have a role in managing materials and waste correctly, however typical roles and responsibilities that may be defined as part of both the construction and operational phase SWMPs (not an exhaustive list) are summarised as follows:

Environmental Site Officer

- responsible for the overall management, co-ordination and dissemination of the project waste management requirements through the final CEMP;
- supported by the Site Waste Management Representative, has responsibility for legal compliance, preparation of plans (including the construction phase SWMP), reviewing waste data, investigating incidents, near misses and non-conformances and organising site and waste audits; and
- development of training presentations and task briefings/ toolbox talks for construction staff and maintaining training records and certificates of competence.

Site Foreman

- responsible for ensuring a system is implemented that identifies and manages the waste being produced;
- implements a construction phase SWMP as a 'live' document, identifying an appropriate strategy and KPIs; and
- co-ordinates waste management on-site.

Site Waste Management Representative

- co-ordinates the identification of materials for re-use or recycling and identifies opportunities for waste reduction;
- provides staff training;

- ensures that all waste storage containers are accurately labelled to show all site workers where to deposit specific materials; and
- liaises with the management team to ensure the appropriate management of incoming materials, the establishment of waste management contracts, and the provision of receptacles.

Site Personnel (as relevant)

- reduction of materials ordered to reduce the amount of waste produced;
- correct handling and storage of materials to prevent damage and wastage;
- co-ordinating the reuse or recycling of materials for alternative usage where possible;
- correct handling of waste materials by containment, separation and storage;
- labelling of waste storage containers to show where to deposit specific materials;
- checking that containers are stored safely and securely; and
- monitoring the disposal of waste to appropriate sites, with correct documentation completed.

A.2.23 The construction phase SWMP will further define and assign the responsibilities of personnel at the Site in relation to waste management.

Audit Monitoring and Review

A.2.24 To be most effective, it is important that the construction phase SWMP is a live document which, like the final CEMP, is regularly reviewed and updated. Waste will be monitored routinely. Monitoring of waste and implementation of waste management plans will assist in achieving waste minimisation obligations, as detailed within the construction phase SWMP as well as helping to identify opportunities for improvements and potential cost reductions.

A.2.25 The following is not an exhaustive list and represents typical activities undertaken at each stage.

A.2.26 Waste monitoring (undertaken quarterly as a minimum), including:

- updating the construction phase SWMP at regular intervals to illustrate changes to the Proposed Development Site, such as waste types, volumes, sub-contractors and changes in personnel and to drive continual improvement in promoting management of wastes as high up the waste hierarchy as possible;
- monitoring compliance with relevant legislation and regulations and checking that the construction phase SWMP is being implemented appropriately, monitored through regular site inspections;

- completing monthly logs detailing the volume of material brought on-site and the volume of waste generated, including the type and route of disposal/ recovery; and
- collating monthly data detailing all waste movements into a quarterly report to be submitted to the Environmental Site Officer for use during the annual waste audit and waste review.

4.1.1 Waste auditing (undertaken annually as a minimum), including collating/ reviewing:

- operations/ staffing levels, composition, waste monitoring reports and quantity of waste generated;
- current waste management procedures;
- existing activities including, for example, key roles and responsibilities; and
- an estimation of waste volumes including a comparison from previous and projected years (where appropriate);

4.1.2 The results of the waste audit will be used to inform the waste review.

4.1.3 A waste review would be undertaken following the completion of a waste audit and the completion of regular waste monitoring. The review would provide an opportunity to consider the suitability of the management strategies that are in place in relation to relevant regulations and best practice procedures, and identify areas for improvement, lessons to be learnt and improved cost saving and sustainability; and the review would consider monthly, quarterly and annual reports, compare waste related data that has been collected and include guidance and proposals to drive continual improvement.

4.1.4 The monitoring procedures detailed above will be undertaken as a minimum and defined within the construction phase SWMP.

Conclusion and Summary

A.2.27 This Framework SWMP presents the approach that will be implemented during the construction phase.

A.2.28 This Plan illustrates and seeks to guide the appointed contractor and Applicant to:

- recognise that the construction phase SWMP will underpin the approach to waste management for the Proposed Development construction phase;
- define indicative roles and responsibilities within the organisations to ensure those responsible for waste management are aware of their remit;
- demonstrate that key waste legislation will be met, and local and regional drivers will be fulfilled, including reviewing procedures should waste legislation and guidance be amended or updated in future;

- demonstrate that the construction phase will minimise waste as far as reasonably practicable in accordance with best practice via the implementation of a construction phase SWMP;
- develop a proactive and coordinated approach to sustainable waste management, reuse and recycling that will be encouraged and implemented at the Proposed Development Site through a number of recycling initiatives to divert as much recyclable waste as possible from landfill; and
- record and audit waste movement during construction.

A.2.29 Where individual waste types have not been identified within this Framework SWMP, these will be assessed in the construction phase SWMP.

## A.3 References

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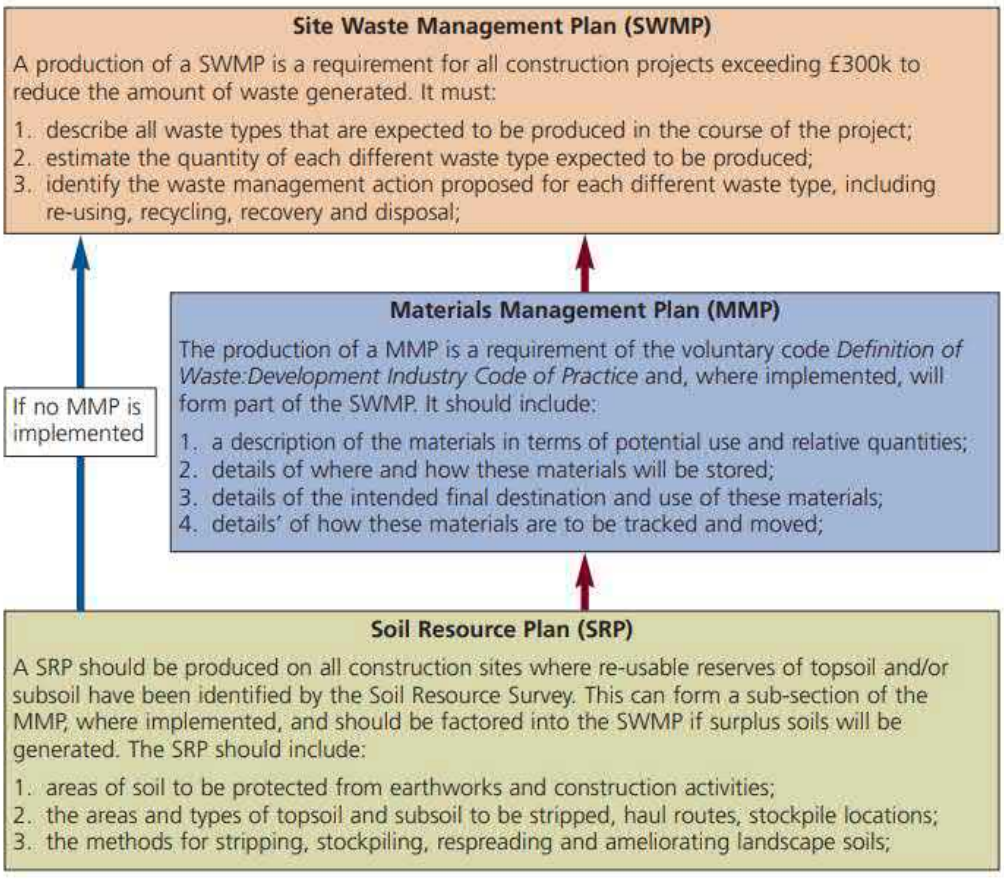
# APPENDIX B FRAMEWORK SOIL RESOURCES PLAN (SRP)

## B.1 Introduction

B.1.1 This Framework Soil Resources Plan illustrates and seeks to guide the appointed contractor and Applicant in relation to the approach that will be implemented during the construction phase for the handling, movement and temporary storage of soils, including those agricultural soils classified as 'best and most versatile' that will be disturbed for temporary laydown for the Proposed Development. The relationship between this Framework Soil Resources Plan and the SWMP presented in Appendix A is illustrated in Plate B.1 below (CIRIA, 2009)

**Plate B.2~~1~~: Hierarchal relationship of Site Waste Management Plans, Material Management Plans and Soil Resources Plans**




*Source: Defra Code of Practice for the Sustainable Use of Soils on Construction Soils*

Aims and Objectives

B.1.2 The objective of this Soil Resources Plan is to avoid any reduction in long term capability, which could downgrade the quality of the disturbed land, through the

adoption of good practice techniques in handling, storing and reinstating soils on that land, once construction is complete.

B.1.3 Measures in this Framework Soil Resources Plan will enable soils to be managed by the appointed contractor via an approved Soil Resources Plan so that they can be returned to their original uses in a suitable condition and remain able to fulfil their identified pre-construction function, or provide other beneficial uses, such as supporting landscape planting and biodiversity, where this has been agreed.

B.1.4 The final Soil Resources Plan will confirm the most appropriate re-use for the different types of soils and proposed methods for handling, storing and replacing soils in temporary construction laydown areas and wider Proposed Development Site.

B.1.5 The aim of the final Soil Resources Plan will be to re-use as much of the surplus soil resources on-site, in the detailed design of the Proposed Development as is possible. Any surplus soils will be re-used in a sustainable manner (i.e. as close to the Proposed Development Site as possible and to an after-use appropriate to the soil's quality) in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.

B.1.6 The final Soil Resources Plan will also aim to ensure that the quality of soils retained on-site and exported off-site (if required) is maintained by following good practice guidance on soil handling and storage, particularly to avoid compaction and biodegradation of soils that are to be retained on site in storage. In this respect, topsoil must be stockpiled separately to subsoil.

B.1.7 With the adoption of appropriate mitigation for the handling and restoration of soils, most soils will be able to continue their various ecosystem functions on or adjacent to the Proposed Development Site, principally as a medium for producing food and biomass; for storing and cycling water and carbon; and for supporting habitats, biodiversity and landscape planting.

Legislative Background

B.1.8 No specific UK legislation exists in relation to the protection of soil and agricultural land.

B.1.9 The EIA Directive (2014/52/EU) emphasises that public and private projects should consider and limit their impact on land, particularly as regards land required, and on soil, including in relation to erosion, compaction and sealing.

B.1.10 Defra issued Safeguarding our Soils – A Strategy for England in 2011 (Defra, 2011) and since this time, the Government's White Paper, The Natural Choice: securing the value of nature and policies set out in the 25 year Environment Plan (HM Government, 2018), have recognised the role that soils play in contributing to sustainable development including:

- the storage, filtration and transformation of water, carbon and nitrogen in the biosphere;
- the support of ecological habitats, biodiversity and gene pools;
- support for the landscape;
- the protection of cultural heritage;
- the provision of raw materials; and
- the provision of a platform for human activities, such as construction and recreation.

B.1.11 The land use planning context for the consideration of agricultural land and soil resource issues is provided primarily by national policies for development involving agricultural land set out in the National Planning Policy Framework (NPPF) (MHCLG, 2019). Planning policies of most relevance to this assessment are detailed in **Table B.1**.

**Table B.1: Planning Policy of Relevance to the Soil Resources Plan**

| Policy Reference | Content |
|---|---|
| **National Policy - National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2019) and associated Planning Practice Guidance (PPG) (2014)** | |
| NPPF Paragraph 109 | States that the planning system should contribute to and enhance the natural and local environment by, amongst other matters, protecting and enhancing soils. |
| NPPF Paragraph 112 | States that the economic and other benefits of the best and most versatile (BMV) agricultural land should be taken into account in development decisions. Where significant development of agricultural land is demonstrated to be necessary, poorer quality land should be used in preference to that of a higher quality. |
| **Guidance** | |
| National Planning Practice Guidance (2014) | Notes that the agricultural land classification (ALC) system provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system, with direction given to Natural England for further information on ALC. The guidance also confirms that Natural England has a statutory role in advising local |

| Policy Reference | Content |
|---|---|
| | planning authorities about agricultural land quality issues. |
| Soil Strategy for England – Safeguarding our Soils (Defra, 2011) | Sets out Defra's vision that by 2030, all of England's soils will be managed sustainably and degradation threats will be tackled successfully in order to improve soil quality and safeguard the ability to provide essential services for future generations. The Strategy sets out priorities for action in respect of better protection of agricultural soils; protecting and enhancing stores of soil carbon; building the resilience of soils to a changing climate; preventing soil pollution; effective soil protection during construction and development; and dealing with the legacy of contaminated land. |
| Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Department for Environment, Food & Rural Affairs, 2018) | A practical guide to assist the construction industry to protect the soil resources with which it works and achieve good soil management at all stages of the construction process.<br>Advises that the protection, use and movement of soil should be considered from the outset of a development project's planning, through its design and construction phases and on into future maintenance and operation.<br>Provides practical guidance on the following aspects of the sustainable use of soils on construction sites:<br>• identifying existing soil resources on-site;<br>• on-site soil management;<br>• topsoil and subsoil stripping;<br>• soil stockpiling and placement;<br>• sourcing, importing and manufacturing topsoil;<br>• soil aftercare; and<br>• uses for surplus topsoil. |
| **Local Development Framework Policy – North Lincolnshire Council Saved Policies** | |
| Policy M5: Best and Most Versatile Agricultural Land | Relates to mineral working and is therefore only likely to provide limited weight in decision making. |

| Policy Reference | Content |
|---|---|
| (North Lincolnshire Council, 2003) | States that applications for new mineral working on the best and most versatile agricultural land (grades 1, 2 and 3a) will be allowed only where it can be shown that restoration and after-care will preserve the long term potential of the land as a national, high quality, agricultural resource. |

Baseline Conditions

B.1.12 Provisional Agricultural Land Classification (ALC) plans are available from magic.gov.uk and provide guidance on the ALC where agricultural land is to be developed. These plans indicate that the majority of the Proposed Development Site (including the Proposed PCC Site) is located within land classified as Grade 2 (very good).

B.1.13 Land within the Construction Laydown Areas, within the agricultural fields north of the A18 are classified as Grade 1 land (excellent quality) under the Provisional ALC. These areas are currently under arable agricultural land use. Fields are generally subdivided by drainage ditches. There is limited vegetation cover except for boundary vegetation which includes immature hedgerow planting at the western boundary adjacent to the existing access road from the A18.

Measures to Reduce Potential Impacts on Agricultural Land and Soil Resources

B.1.14 The appointed contractor will develop a final Soil Resources Plan, taking into account DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009).

*Pre-Construction Soils Survey*

B.1.15 Prior to construction, a soil survey will be undertaken by an appropriately qualified soil scientist to record agricultural soils to be disturbed during construction of the Proposed Development. Data collected will be used to characterise the topsoils and subsoils and calculate the volumes of soil resources to be disturbed and temporarily stored, in order to inform the soil handling strategy required for the reinstatement of agricultural land in the final Soil Resource Plan.

B.1.16 The soil survey will include as appropriate:

- relevant local topographic features (local relief, slope, aspect, micro-relief), land use and ground cover, flood risk and climatic information;
- depth of the topsoil, upper subsoil (where present) and lower subsoil horizons;

- soil textures;
- soil structures;
- soil colours;
- stone content;
- signs of impeded drainage and presence of slowly permeable layers;
- presence of calcium carbonate; and
- sampling for laboratory analysis of pH, major nutrients (extractable phosphorus, potassium and magnesium) and organic matter content.

B.1.17 Other features that will be recorded for reinstatement include:

- drainage, irrigation and water supplies;
- roads, accesses and paths; and
- hedgerows, ditches, field boundaries and ponds, where presented.

B.1.18 The soil survey report shall contain specific recommendations that the appointed contractor will adhere to in order to provide appropriate methods for handling and storing soils in order to ensure that these are suitable for agricultural re-instatement following construction.

*Handling and Storage of Soils During Construction*

B.1.19 The following measures will be considered, and implemented, as far as reasonably practicable by the appointed contractor in relation to the handling and storage of soils during construction:

- separate handling and storage of different soils, particularly topsoils and subsoils will be undertaken under suitable weather and soil conditions using appropriate machinery;
- handling soils that are in a suitably dry condition and not during wet weather to avoid long-term damage to soil structure from compaction;
- seed for grass cover or seal excavated material and soil stockpiles;
- the prevention of soil contamination with chemicals or other materials; and
- the control of weeds on soil stores, either through treatment or removal.

B.1.20 Prior to stripping, the final Soil Resource Plan shall provide a record of the locations, contents and approximate volumes of soil stockpiles taking into account the soil survey results and relevant land parcel of origin which shall be subsequently restored.

B.1.21 All soils will be managed in accordance with the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites (Defra, 2009) to minimise impacts on soil structure and quality.

B.1.22 A requirement is included in the draft DCO in order to ensure the sustainable use of displaced soils.

## B.2 References

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# APPENDIX C HAUL ROAD ECOLOGY PROTECTION MEASURES

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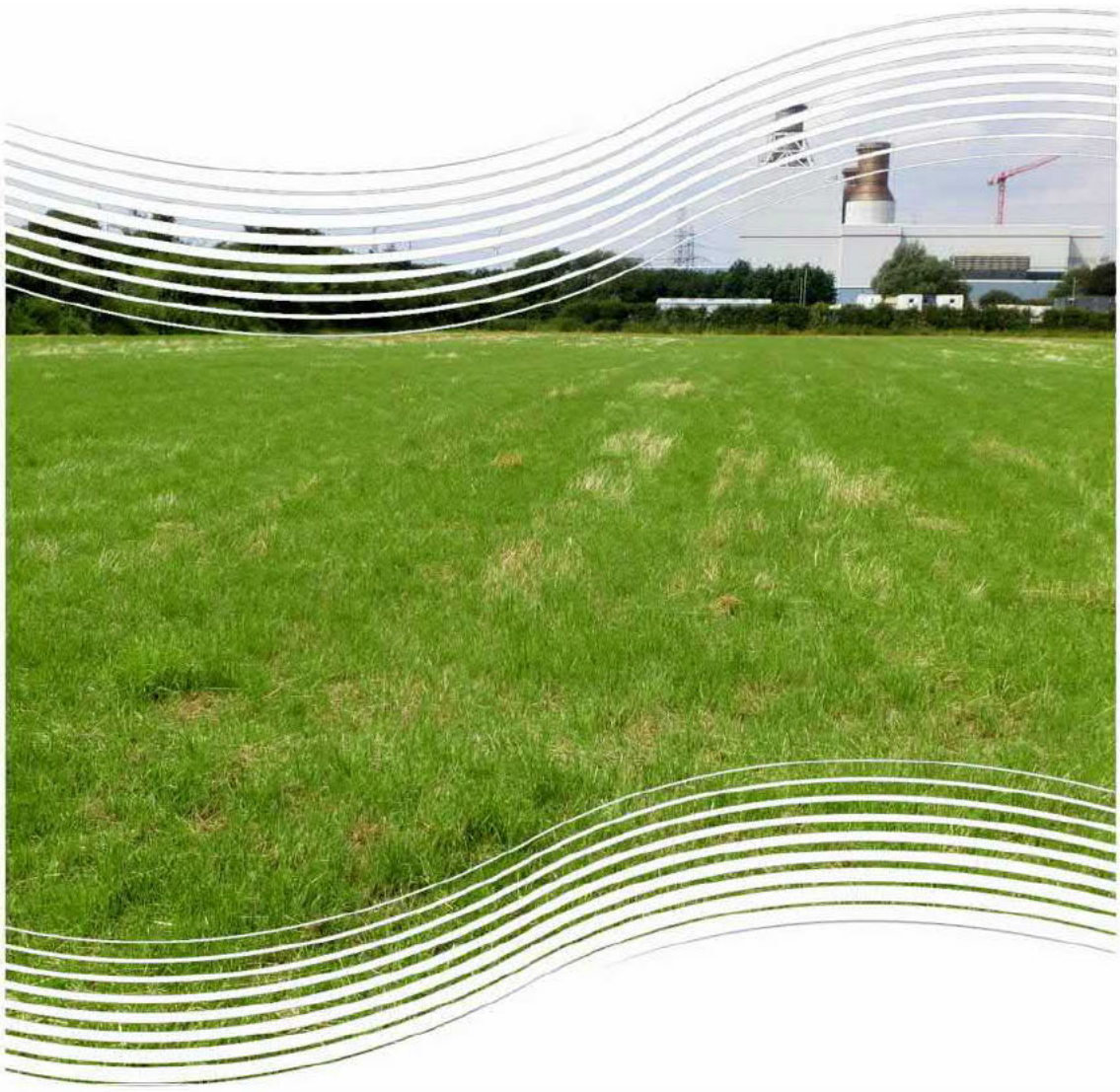

# Preliminary Ecological Appraisal

# Keadby 2, Access route

Project No: ERM13 | Client: Environmental Resources Management (ERM) | Date: 24/07/2019

ISSUE RECORD

| | |
|---|---|
| Client name | Environmental Resources Management (ERM) |
| Project name | Keadby 2, Access route |
| Project number | ERM13 |
| Report title | Preliminary Ecological Appraisal |
| Issue number | 1 |
| Date | 24/07/2019 |
| Written by | Chloe Pritchard MCIEEM<br>Principal Ecologist |
| Checked by | Sally Clague<br>Ecologist |
| Approved by | Michelle Cullimore-Pike<br>Senior Ecologist |

The information and advice contained in this report has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Peak Ecology is accredited under ISO9001 and as such this report follows the styles and formatting template set out within our Quality Management Form

| | | | |
|---|---|---|---|
| ISO9001 | QMF 32 | Issue 1 | Reviewed 04/03/2016 |

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EXECUTIVE SUMMARY

**Overview**

A preliminary ecological appraisal was undertaken of a proposed access route to Keadby 2 in July 2019.

**Designated Sites**

There is one statutory designated site within the search area. This was the Humber Estuary classified as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and Ramsar site. Details of eight Local Wildlife Sites (LWS), a non-statutory local designation, were also provided.

None of the designated sites are likely to be impacted upon by the proposals with suitable precautions in place.

**Habitats**

The habitats recorded on site included two ditches with adjacent hedgerows, establishing semi-improved grassland, arable and hard standing. None of the habitats had high conservation value and neither of the hedgerows would qualify under the Hedgerow Regulations as Important Hedgerows.

**Protected Species**

Breeding birds present the highest risk in terms of protected species and a check for active nests must be undertaken if the hedges are cleared during the bird breeding season (March to September inclusive).

The two ditches provide sub-optimal and poor habitat for water voles, however, given the high level of water vole activity in the area it is advisable to undertake a pre-clearance check to ensure no sign of water voles is present.

Grass snakes are known on site and precautions should be taken during site clearance.

As one of the hedges was very dense (H2) it could not be sufficiently viewed to assess the presence of badger setts. A pre-clearance check, clearing the vegetation in sections, it recommended.

**Should any protected species issues be encountered during the clearance process works must cease until a suitable mitigation strategy is agreed.**

CONTENTS PAGE

# LIST OF TABLES AND FIGURES

# 1 INTRODUCTION

## 1.1 Scope of Report

This report has been prepared by Peak Ecology Ltd on behalf of Environmental Resources Management (ERM). It provides the results of a Preliminary Ecological Appraisal associated with a proposed access route creation for Keadby 2. The purpose of this report is to:

- Describe the existing habitat types present within the site;
- Provide an assessment of habitat suitability for protected and/or notable species
- Identify key ecological constraints to the proposed development;
- Provide outline recommendations for mitigation and/or avoidance measures where appropriate;
- Highlight opportunities for ecological enhancement where appropriate; and
- Confirm any further ecological surveys required, for example to confirm presence / likely absence of a specific protected species.

This report is intended to inform the client/developer of the ecological value of the site and highlight any constraints to the proposals and recommended further surveys, it is not designed to be suitable to support a planning application as a standalone document.

The approach to this ecological appraisal follows best practice published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2013 & 2015) and the British Standards Institution (BSI, 2013). Details of individual survey methods and associated supporting information are provided in Section 2.

## 1.2 Site Description

The site comprises a linear route approximately 480m in length (starting at grid reference: SE 83512 11511 and ending at SE 83022 11594). The route is located to the east of Keadby Power Station 1 and passes through a mixture of open fields, hedgerows, ditches and hard standing.

The survey boundary is as per the redline boundary on a sketched drawing provided by the client received via email on 10th July 2019. The site location is illustrated below.

**Figure 1: Location plan showing approximate desired route***


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## 1.3 Zone of Influence

The geographical extent of the potential impact of a proposed development is known as the Zone of Influence. The Zone is determined by the nature of the development and also in relation to individual species, depending on their habitat requirements, mobility and distances indicated in any best practice guideline.

In relation to great crested newts (GCN) *Triturus cristatus* the zone of influence is considered to be up to 500m from the site. In regards to bats the Zone of Influence is considered to be the site itself and any connecting habitat links suitable for use as commuting and foraging corridors.

Appendix A provides a definition of "protected or priority species" for the purposes of this report, and Appendix B provides details on the legislation for species relevant to this site.

# 2 METHODOLOGY

## 2.1 Desk Study

The desk study comprised a review of existing information held by the local biological records centre and other specialist groups, as appropriate. The Greater Lincolnshire Nature Partnership was contacted to obtain locations of designated sites and any existing records of protected or priority species within 2km of the site and a Site Check Report was also carried out using the online interactive mapping tools on the Magic (Multi-Agency Geographic Information for the Countryside) website to identify any statutory designated sites within the search radius.

## 2.2 Phase 1 Habitat Survey

A daytime site visit was carried out on 17th July 2019. Following standard methodology (JNCC, 2010) the survey comprised a walkover of the site to classify and map the extent of individual habitat types, based on the identification of individual plant species. Any evidence of invasive plants such as Japanese knotweed *Fallopia japonica* was also noted.

The extent of the habitats recorded is illustrated on the Phase 1 Habitat Plan in Figure 2, with target notes to provide supplementary information regarding any particular features of ecological interest listed on the figure.

Nomenclature for vascular plant species follows Stace (2010).

## 2.3 Scoping for Protected Priority Species

The habitats present were assessed for their potential to support any legally protected or otherwise notable species and any incidental sightings or field signs discovered during the surveys were recorded.

All British wildlife and countryside legislation, policy and guidance were taken into consideration including;

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation of Habitats and Species Regulations 2017;
- EC Council Directive on the Conservation of Wild Birds 79/409/EEC;
- The Protection of Badgers Act 1992;
- The Countryside and Rights of Way Act 2000;
- The Hedgerow Regulations 1997;
- The Natural Environment and Rural Communities Act 2006; and
- The UK Post-2010 Biodiversity Framework (formerly known as UK BAP).

Appendix B provides greater detail on the legislation context relevant to this site.

Methodologies for the survey are provided in Appendix C.

## 2.4 Surveyors

The habitat survey and scoping for protected species was carried out by Chloe Pritchard BSc (Hons) MCIEEM, assisted by Charlotte Haylock. Chloe has been a professional ecologist for over 13 years and is experienced in the use of the Phase 1 Habitat Survey methodology, identification of vascular plants and scoping assessments for protected species.

Both are appropriately qualified for these types of survey based on the CIEEM competency framework (CIEEM, 2012).

## 2.5 Limitations

### 2.5.1 *3rd Party Data*

Desk study data obtained for this assessment is provided and validated by third parties therefore Peak Ecology have no control over any errors within the dataset. The data represents the information available at the date of request and a lack of records for any particular species does not necessarily indicate absence from the local area as many species are under-recorded.

### 2.5.2 *Survey Methods*

Based on the identification of individual plant species, the Phase 1 Habitat Survey provides sufficient information to enable classification of broad habitat types; however, it does not constitute a detailed botanical survey. Plant species lists compiled by this type of survey should not be considered definitive as not all species will be apparent at all times of year.

The scoping assessment for protected species highlights habitats and features suitable for protected species and notes any incidental sightings or field signs discovered; however, it should not be interpreted as providing a comprehensive presence / likely absence survey for any individual species.

### 2.5.3 *Access*

The majority of the site was accessible; however, it was not possible to gain a full view of one of the ditches (D2) due to dense vegetation.

### 2.5.4 *Survey Timing and Conditions*

The survey was undertaken at an appropriate time of year under suitable weather conditions.

### 2.5.5 *Lifespan of Data*

The results and recommendations contained within this report are considered to be valid for up to two years from the date of survey, assuming that there are no significant changes to the site condition or management within this period. After this period, or should the site conditions change, an update may be required in order to inform ecological constraints to development proposals and/or accompany a planning submission.

# 3 RESULTS

## 3.1 Desk Study

### 3.1.1 *Designated Sites*

There is one statutory designated site within the search area. This was the Humber Estuary classified as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) and Ramsar site. Details of eight Local Wildlife Sites (LWS), a non-statutory local designation, were also provided. Further details of each of these sites are provided in the table below.

**Table 1: Designated sites identified during the desk study**

| Name | Status | Reason for Designation | Approximate distance & Direction from site |
|---|---|---|---|
| Humber Estuary | SSSI | Information not provided | <20m from eastern end |
| Humber Estuary | SAC | Bird interest | <20m from eastern end |
| Humber Estuary | Ramsar | Bird interest | <20m from eastern end |
| Gunness Common | LWS | Information not provided | 1.5km east |
| Keadby Boundary Drain | LWS | Information not provided | 620m north |
| Keadby Warping Drain | LWS | Information not provided | 650m north |
| Keadby Wet Grassland | LWS | Information not provided | 300m south-west |
| Keadby Wetland | LWS | Information not provided | 300m south-west |
| South Soak Drain, Keadby | LWS | Information not provided | 100m south |
| Stainforth and Keadby Canal Corridor | LWS | Information not provided | 100m south |
| Three Rivers | LWS | Information not provided | 380m south |

### 3.1.2 *Protected and Priority Species*

The table below provides a summary of the species records received from GLNP that are considered most relevant to the site and/or proposals. No location data was provided; however, all records are from the 2km search area. The full dataset is not included here but is available on request.

**Table 2: Summary of protected and priority species records relevant to the site and/or proposals**

| Species | Date of record/s | Number of Records | Status |
|---|---|---|---|
| **Birds** | | | |
| Bullfinch, *Pyrrhula pyrrhula* | 2003 - 2014 | 2 | Local Priority |
| Cetti's Warbler, *Cettia cetti* | 2009 | 1 | Schedule 1 |
| Corn Bunting, *Emberiza calandra* | 2003 - 2010 | 12 | Local Priority |

| Species | Date of record/s | Number of Records | Status |
|---|---|---|---|
| House Sparrow, *Passer domesticus* | 2003 - 2015 | 21 | Priority, Local Priority |
| Lesser Redpoll, *Acanthis cabaret* | 2014 | 1 | Priority |
| Linnet, *Linaria cannabina* | 2003 - 2015 | 12 | Priority, Local Priority |
| Reed Bunting, *Emberiza schoeniclus* | 2003 - 2015 | 14 | Priority, Local Priority |
| Skylark, *Alauda arvensis* | 2003 - 2015 | 9 | Priority, Local Priority |
| Tree Sparrow, *Passer montanus* | 2003 - 2010 | 16 | Priority, Local Priority |
| Yellowhammer, *Emberiza citrinella* | 2003 - 2015 | 6 | Priority, Local Priority |
| **Reptiles and amphibians** | | | |
| Common Frog, *Rana temporaria* | 1977 - 2003 | 10 | Protected |
| Common Toad, *Bufo bufo* | 1977 - 2003 | 9 | Priority, Local Priority |
| Great Crested Newt, *Triturus cristatus* | 1997 | 1 | Protected, Priority, Local Priority |
| Smooth Newt, *Lissotriton vulgaris* | 1977 - 2012 | 2 | Protected, Local Priority |
| Common Lizard, *Zootoca vivipara* | 1977 | 1 | Protected |
| Grass Snake, *Natrix helvetica* | 1977 - 2016 | 12 | Protected |
| **Mammals** | | | |
| Brown Hare, *Lepus europaeus* | 1977 - 2012 | 12 | Priority |
| Eurasian Badger, *Meles meles* | 2006 - 2017 | 69 | Protected |
| European Water Vole, *Arvicola amphibius* | 1977 - 2017 | 84 | Protected, Priority, Local Priority |
| Harvest Mouse, *Micromys minutus* | 2003 | 1 | Priority |
| West European Hedgehog, *Erinaceus europaeus* | 1977 - 2017 | 18 | Priority |
| Bats, *Chiroptera* | 2001 - 2015 | 12 | Protected, Priority |
| Common Pipistrelle, *Pipistrellus pipistrellus* | 2002 - 2016 | 8 | Protected, Priority |
| Pipistrelle Bat species, *Pipistrellus* | 2010 | 1 | Protected, Priority, Local Priority |
| Soprano Pipistrelle, *Pipistrellus pygmaeus* | 2003 | 1 | Protected, Priority, Local Priority |

*NB. Due to high risk of persecution of this species, badger records remain confidential at the request of the records centre.

## 3.2 Phase 1 Habitat Survey

The individual habitat types recorded at the site are described under the sub-headings below, with the location and extent of each illustrated on the Phase 1 Habitat map. No evidence was found of any invasive plant species such as Japanese knotweed. Botanical species lists are provided in Appendix D with representative photographs in Appendix E.

### 3.2.1 *Buildings and Hardstanding*

Sections of the proposed route will pass through areas of hard standing, including a recently created car park, an area with portacabins and the ground associated with PD Ports. No buildings lie within the footprint of the proposed route and it is understood that no buildings would be impacted upon by the proposals.

### 3.2.2 *Hedgerows*

Two hedgerows lie within the route of the proposed access road. Hedge 1 (H1) lies centrally within the route and is bordered by an arable field and a ditch (D1), with a newly created car park beyond the ditch to the west. It is species poor, dominated by relatively young hawthorn *Crataegus monogyna* trees, creating a narrow border. The hedge appeared to be under a current management regime.

Hedge 2 (H2) was a species poor native hedge located towards the eastern end of the route and forms the boundary to the arable field. To its east and south were the PD Ports grounds consisting of hard standing and a large warehouse style building. This hedge is unmanaged and dominated by elm *Ulmus procera* with occasional hawthorn and bramble *Rubus fruticosus agg.*. A number of the hedgerow trees were dead. Ditch 2 (D2) is located at the base of this hedge.

### 3.2.3 *Ditches*

There are two ditches which would be dissected by the proposed route, adjacent to hedges 1 and 2, respectively. D1 was approximately 2m wide, it was not possible to estimate the depth due to significant algal blooms on the water's surface and health and safety protocols. Aquatic vegetation was limited to grasses at the edges and occasional plants such as common reed *Phragmites australis,* bittersweet *Solanum dulcamara* and celery-leaved buttercup *Ranunculus sceleratus*. Recent disturbance was evident along the western bank of the ditch and in the main channel in places, this was attributed to the recent works undertaken to create the adjacent car park. The bank vegetation consisted of tall ruderal species such as creeping thistle *Cirsium arvensis*, common nettle *Urtica dioica*, broad-leaved dock *Rumex obtusifolius*, redshank *Persicaria maculosa* with tufted vetch *Vicia cracca*, black medick *Medicago lupinus* and meadow vetchling *Lathyrus pratensis*.

Ditch 2 was located within Hedge 2 and was very difficult to view due to dense hedgerow vegetation. One area could be viewed which had very shallow water and tall ruderal vegetation consisting of willowherbs *Epilobium* sp. docks *Rumex* sp., thistles *Cirsium* sp. and nettles.

### 3.2.4 ***Semi-improved grassland***

To the west of the route there was an area of establishing grassland on a recently cleared area of soil. Areas of bare ground were present between the grassland vegetation which consisted of typical pioneer species such as creeping thistle, mayweed *Matricaria sp.* and redshank and species likely to have been introduced via a seed mix including bird's-foot trefoil *Lotus corniculatus*, yarrow *Achillea millefolium*, ox-eye daisy *Leucanthemum vulgare* and ribwort plantain *Plantago lanceolata*. Grasses present included Yorkshire fog *Holus lanatus* and perennial rye grass *Lolium perenne*.

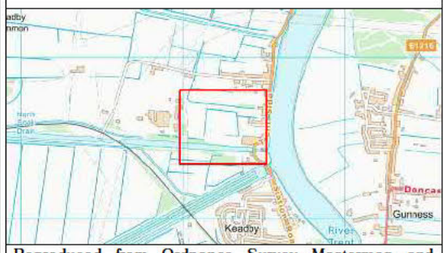
### 3.2.5 ***Arable***

The proposed route passes through a large arable field which consisted of almost entirely perennial rye grass. The field had been recently cut and was therefore less than 5cm in height.


## Map Legend

Site Information

- Approximate centreline of proposed route
- Semi-improved grassland
- Tall ruderal
- Arable
- Hardstanding
- Building
- Cabins
- Ditch
- Hedgerow
- Scattered tree



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| | |
|---|---|
| Project | Keadby Power Station - Proposed Access Road |
| Figure | Extended Phase 1 Habitat Survey |
| Client | Environmental Resources Management |

| Date | Reviewer | Version | Scale | Size |
|---|---|---|---|---|
| 24/07/19 | MP | 1.1 | 1:1,550 | A3 |

## 3.3 Protected and Priority Species Assessment

### 3.3.1 *Amphibians and Reptiles*

The two ditches on the site were considered to be sub-optimal for amphibians, and presence of great crested newts on site have been ruled out previously within ecological assessments. Grass snakes have, however, been observed on the site, by Peak Ecology ecologists, and are often associated with ditch banks and grasslands. The grasslands and ditches which may be impacted upon do not represent optimal habitat for grass snakes or other reptiles, however as grass snakes are known in the area their presence cannot be ruled out.

### 3.3.2 *Badgers*

No evidence of badger was noted during the survey. However, it is possible that badgers use the site for foraging. Whilst no mammal paths were identified leading in to the hedges, it is possible that a badger sett may be located within the dense vegetation in Hedge 2.

### 3.3.3 *Bats*

The site has potential to support foraging bats but is not considered to be optimal habitat, especially given the location of the nearby river and ditches which would provide more suitable habitat. None of the trees on site had obvious potential roosting features. The dead trees within Hedge 2 were immature trees which were not large enough to create roosting features.

### 3.3.4 *Birds*

No birds were identified within the hedgerows to be impacted upon, however sedge warblers *Acrocephalus schoenobaenus* were heard singing near to Hedge 2. The dense structure of Hedge 2 is highly likely to support nesting birds, Hedge 1 also provides suitable nesting habitat. Insufficient vegetation is present in D1 to support nesting birds.

### 3.3.5 *Water Vole*

Neither ditch is considered to be optimal for water vole, however D1 had some limited potential as it held water at the time of survey but had limited aquatic vegetation. Works had been undertaken close to this ditch, including to the west bank, thus reducing bankside vegetation and therefore water vole potential. D2 did not appear to hold a suitable depth of water and was very overgrown, which minimises the chances of water voles using the ditch.

A water vole population is known in the area; surveys have been undertaken within the footprint of Keadby 2 and in ditches in the wider area by Spires Ecology (2017) and Peak Ecology (2019), therefore a good understanding of the distribution of water vole is known. The two ditches on site have not however been surveyed previously. They are not directly linked to any ditches known to support water voles.

### 3.3.6 *Other Protected and/or Notable Species*

There is potential for hedgehogs to utilise the site possibly by taking refuge at the hedge bases. Brown hare may also be present within the arable field. Due to a lack of suitable habitats, the site is not considered likely to support any other protected or notable species.

# 4 EVALUATION AND ASSESSMENT OF EFFECTS

## 4.1 Designated Sites

The nearby designated sites are unlikely to be impacted upon by the proposals due to the small scale of the anticipated impacts.

## 4.2 Habitats & Botanical Interest

None of the habitats on site were of high conservation value, neither hedgerow would qualify under the Hedgerow Regulations due to their low diversity and the grassland is not a good example of its habitat type as it is still establishing. The habitats are relatively easily replaced in a reasonable timeframe.

## 4.3 Protected and Priority Species

### 4.3.1 *Amphibians and Reptiles*

One record of great crested newt was returned from the desk study, and the habitats on site are sub-optimal for this species, moreover, no great crested newts have been recorded during previous surveys at Keadby therefore this species is considered likely absent from the site. It is possible that common amphibians, such as common frog or smooth newts are present, however the ditches on site do not provide optimal habitat.

Grass snake has been observed on the site on a ditch bank. It is possible that this species is present in either of the two ditches and are therefore vulnerable to harm during the vegetation clearance or construction of the road.

### 4.3.2 *Badger*

Whilst no evidence of badger was identified during the site visit, the site is considered likely to support foraging and commuting badgers, and possibly setts within the banks of Hedge 2 which could not be fully viewed due to dense vegetation. If a sett is present within Hedge 2 it could be damaged or destroyed when the bridge is installed, which could potentially harm any animals present, causing short term negative impacts. The construction of the road itself is unlikely to impact upon local badgers in the longer term.

### 4.3.3 *Bats*

The area surrounding the proposed road route provides foraging and commuting habitat for bats, however more suitable habitat is provided nearby within woodland and river corridors. No bat roosting features were identified within the proposed route. The loss of the hedgerow sections is unlikely to significantly affect the local bat population.

### 4.3.4 *Birds*

The hedgerows provide suitable habitat for a range of bird species. It is highly likely that bird's nests could be damaged or destroyed during hedge cutting if this is undertaken between the months of March and October. The loss of the hedgerow sections themselves are unlikely to significantly impact upon the local bird population.

### 4.3.5 *Water vole*

The two ditches on the site have been identified as sub-optimal (D1) and poor (D2) quality for water vole, however, a large population of water voles is known to be present in a number of the nearby ditches, therefore the presence of this species should not be entirely ruled out.

The closest known presence of water vole is within ditches adjacent to Chapel Lane, which support high water vole activity and are located approximately 300m to the north of the site (Peak Ecology, 2019). They are also known to be present in the South Soak Drain approximately 400m south-west of D1 (Spires Ecology, 2017). These ditches do not appear to be directly linked to D1, however water vole will travel across terrestrial ground to access suitable habitats. Given the distance and the intervening habitat it is considered reasonably unlikely that water voles would have colonised D1 or D2.

As water voles are known in the vicinity of the site, consideration should be given to the potential impacts in the unlikely event that they are found to be present. In this instance water voles could be disturbed or harmed during the installation of the proposed steel bridge platforms and potentially disturbed by the hedgerow cutting. It has been indicated that the hedgerow stumps would remain in situ which would avoid significant damage to the ditch banks.

As the ditches are poor quality for water voles it is unlikely that the installation of the bridges would significantly impact upon the local population. However, it should be noted that if water voles are found to be present at any point, during or prior to works commencing, works would have to cease and a displacement licence would be required to safeguard individuals and their burrows.

### 4.3.6 *Other Protected and/or Notable Species*

Brown hare and hedgehog may be vulnerable to harm, in particular young hares or nests of hedgehogs which may be located at the hedge bases or margins. This risk is considered to be low as the habitats are not optimal for either species.

# 5 RECOMMENDATIONS

## 5.1 Additional Surveys

No additional surveys are considered necessary; however, pre-commencement checks are necessary for breeding birds, water voles, grass snake and badgers. See below.

## 5.2 Mitigation/Compensation Measures

As a precautionary measure, it is recommended that a check for evidence of water voles is undertaken prior to any disturbance of the ditches or their banks (including hedge removal). Water vole are considered more likely to be found within D2. If any evidence of water vole is identified all works should cease until a full survey is undertaken and suitable mitigation put in place.

A search for badger setts, in particular in Hedge 2 is also advisable prior to hedge clearance. If a badger sett is identified within 15m of the route, works should cease until suitable mitigation has been agreed, which may involve re-aligning the route.

Vegetation should not be cut to lower than 15cm in the first instance so as to avoid potential harm to grass snake, this is particularly important for H2/D2.

It is understood that the preparation works for the route are planned for July 2019, which is within the breeding bird season. It is therefore recommended that an ecologist checks the hedges for active nests prior to removal. Any nests identified would need to be protected by a species appropriate buffer, identified via tape, to ensure machinery does not disturb an area of 5m either side of the nest. Once the nesting is complete the works can continue.

## 5.3 Ecological Enhancement

National planning policy recommends that all developments incorporate ecological enhancement in order to “pursue opportunities for securing measurable net gains for biodiversity” (NPPF, 2019), therefore consideration should be given to the following suggestions.

- Gapping up of hedgerows would enhance connectivity of the site for wildlife and provide resources, such as nectar, fruit and nest sites. Suitable native hedgerow shrubs include hawthorn, blackthorn *Prunus spinosa*, hornbeam *Carpinus betulus*, beech *Fagus sylvatica*, field maple *Acer campestre* and dogwood *Cornus sanguinea*.
- Use native species within soft landscaped areas. Many native plants are suitable for inclusion in planting areas, including herbaceous perennials, annual plants, trees and shrubs. Suitable species are listed on the RHS website: [redacted]
- Ongoing management of habitats can impact upon their value for wildlife, abstaining from the use of pesticides and relaxing the management of habitats, such as hedgerows can increase the resources provided to wildlife.

# 6 CONCLUSIONS

The proposed route passes through a mixture of habitat types, from hard standing, to hedges and ditches and an arable field. The ecological constraints associated with the route are relatively limited, with breeding birds the most likely protected species to be encountered. There is a low risk of water vole and grass snake presence. As H2 could not be viewed sufficiently during the site survey it was not possible to see whether badger setts were present, therefore this also needs to be considered.

The anticipated constraints can be managed by the presence of an ecologist who will conduct a check for these species prior to clearance. If any protected species issues are encountered which cannot be resolved on the day, such as the presence of protected species requiring significant alterations to proposed works or protected species license, works should cease until a suitable mitigation strategy is agreed.

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## APPENDICES

## APPENDIX A : Protected and Priority Species

Legal protection is afforded to particular habitats and species (as well as designated sites), see Appendix B. The legislation, and the habitats and species listed, vary between the different jurisdictions. Certain habitats and species are also considered to have some level of nature conservation importance, due to factors such as their rarity, vulnerability or declining population/status. This document uses the term 'priority habitats' and 'priority species', as they are those which should be considered as priorities for conservation (it should not be confused with priority habitats and species as listed in the EU Habitats Directive). Priority habitats and species are defined as those which are:

1) listed as a national priority for conservation (such as those listed as habitats and species of principal importance for the conservation of biodiversity);
2) listed as a local priority for conservation, for example in the relevant local Biodiversity Action Plan (BAP);
3) Red Listed using International Union for the Conservation of Nature (IUCN) criteria (e.g. in an all-Ireland Red List, in one of the UK Species Status Project reviews, in the Species of Conservation Concern Red List, Birds of Conservation Concern in Wales, or BWI/ RSPB Red List for Ireland and Northern Ireland (Birds of Conservation Concern in Ireland 2014 to 2019) or, where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book);
4) listed as Near Threatened or Amber Listed e.g. in an all-Ireland Red List, in one of the UK Species Status Project reviews, in Birds of Conservation Concern in Wales, in the Species of Conservation Concern Amber List or BirdWatch Ireland (BWI)/RSPB Amber List for Ireland and Northern Ireland (Birds of Conservation Concern in Ireland 2014 to 2019);
5) listed as a Nationally Rare or Nationally Scarce species (e.g. in one of the Species Status Project reviews) or listed as a Nationally Notable species where a more recent assessment of the taxonomic group has not yet been undertaken; and/or
6) endemic to a country or geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place).

Most protected species are also considered to be priority species, although there are some exceptions. There are numerous priority habitats and species which do not receive any legal protection.

Note that the terms 'priority habitat' and 'priority species' used in this document differ from the following uses of the same terms:

a) These terms were previously used to denote those habitats and species afforded the highest level of priority for conservation under the UK BAP; this has been superseded by the lists of habitats and species of principal importance for the conservation of biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, Section 7 of the Environment (Wales) Act 2016, or their equivalents in Scotland

(Nature Conservation (Scotland) Act 2004, Scotland's Biodiversity Strategy and the Scottish Biodiversity List15) and Ireland (Actions for Biodiversity – Ireland's National Biodiversity Plan 2017 -202116; and Valuing Nature – A Biodiversity Strategy for Northern Ireland to 2020).

b) The terms 'Priority Natural Habitat Type' and 'Priority Species' are used to denote specific lists of habitats and species under The Conservation of Habitats and Species Regulations 2017; these are defined in Articles 1(d) and 1(h) respectively of the Habitats Directive.

## APPENDIX B : Relevant Legislation

The following text provides information on the key legislation, which is applicable to this survey.

The main wildlife legislation in the UK is as follows:

### European Legislation

The relevant sections of the EC Directives and international conventions are summarised below:

- EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitat Directive 1992) as amended (92/43/EEC)

The Directive requires Member States to introduce a range of measures including the protection of species listed in the Annexes. The 189 habitats listed in Annex I of the Directive and the 788 species listed in Annex II, are to be protected by means of a network of sites. Once adopted, these are designated by Member States as Special Areas of Conservation (SACs), and along with Special Protection Areas (SPAs) classified under the EC Birds Directive. The Habitats Directive introduces the precautionary principle; that disturbance to the designated sites can only be permitted having ascertained no adverse effect on the integrity of the site.

- EC Directive on the Conservation of Wild Birds (Birds Directive 1979) as amended (79/409/EEC)

The main provisions of the Directive includes; the maintenance of the favourable conservation status of all wild bird species across their distributional range.

- Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)

The Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

### UK Legislation

The sections of UK legislation considered to be of relevance include:

- The Conservation (Natural Habitats, and c.) Regulations 2017

This transposes the Habitats Directive into national law. The Regulations provide for the designation and protection of 'European sites', and the protection of 'European protected species.

- The Wildlife and Countryside Act 1981 (as amended) (WCA)

This consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain.

- The Countryside and Rights of Way Act 2000 (CRoW)

This act strengthens wildlife enforcement legislation.

- The Protection of Badgers Act 1992

### Species-Specific Legislation

Species specific legislation is provided in the Table below:

**Species-Specific Wildlife Legislation**

| Feature/Species | Legislation | It is an offence to: |
|---|---|---|
| Plants | Sch. 8 Wildlife and Countryside Act 1981 (as amended) | • Pick;<br>• Uproot;<br>• Trade;<br>• Possess (for trade)<br>Any wild plant listed. |
| Invasive weeds – Japanese knotweed, Himalayan balsam, | Sch. 9 Wildlife and Countryside Act 1981 (as amended) | • Allow to spread. |
| Hedgerows | Hedgerow Regulations 1997. | Outlines a number of criteria for designation of 'important' hedgerows.<br>'Important' hedgerows cannot be removed without notifying the relevant body. |
| Breeding birds | Wildlife and Countryside Act 1981 (as amended).<br>Countryside and Rights of Way Act 2000. | • Kill;<br>• Injure;<br>• Take;<br>any wild bird, their eggs or nest (with the exception of those on Sch. 2). |
| Specially protected birds | Sch. 1 Wildlife and Countryside Act 1981 (as amended). | As above but includes:<br>• Disturbing birds at their nest, or their dependent young. |

| Feature/Species | Legislation | It is an offence to: |
|---|---|---|
| Badgers | The Protection of Badgers Act 1992 | • Wilfully kill, injure, take, or cruelly ill-treat a badger, or attempt to do so;<br>• Possess any dead badger or any part of, or anything derived from, a dead badger;<br>• Intentionally or recklessly interfere with a sett by disturbing badgers whilst they are occupying a sett, damaging or destroying a sett, causing a dog to enter a sett, or obstructing access to it.<br>A badger sett is defined in the legislation as "*any structure or place, which displays signs indicating current use by a badger*". |
| Bats | Sch. 5 Wildlife and Countryside Act 1981 (as amended).<br>Conservation of Habitats and Species Regulations 2017. | • Intentionally or deliberately kill, inure or capture (or take) bats:<br>• Deliberately disturb bats (whether in a roost or not);<br>• Recklessly disturb roosting bats or obstruct access to their roosts;<br>• Damage or destroy bat roosts. |
| Common reptiles | Sch. 5 Wildlife and Countryside Act 1981 (as amended).<br>Countryside and Rights of Way Act 2000. | Deliberate or reckless:<br>• Killing;<br>• Injuring<br>• Sale. |
| Common amphibians | Sch. 5 and Sch. 9 Wildlife and Countryside Act 1981 (as amended).<br>Countryside and Rights of Way Act 2000. | • Sell;<br>• Transport; and<br>• Advertise for sale. |

| Feature/Species | Legislation | It is an offence to: |
|---|---|---|
| Great crested newt | Sch. 5 Wildlife and Countryside Act 1981 (as amended). Conservation of Habitats and Species Regulations 2017. | • Kill;<br>• Injure;<br>• Disturb<br>• Destroy any place used for rest or shelter. |
| Water vole | Sch. 5 Wildlife and Countryside Act 1981 (as amended). | • Deliberately capture, injure or kill;<br>• Disturb a water vole whilst it is in its breeding or resting place;<br>• Damage, destroy or obstruct a water vole's breeding or resting place. |
| Otter | Sch. 5 Wildlife and Countryside Act 1981 (as amended). Conservation of Habitats and Species Regulations 2017. | • Deliberately capture, injure or kill an otter;<br>• Disturb an otter in its breeding or resting place;<br>• Damage, destroy or obstruct an otter's breeding or resting place. |
| White-clawed crayfish | Sch. 5 Wildlife and Countryside Act 1981 (as amended). Conservation of Habitats and Species Regulations 2017. | • |

In addition, species and habitats listed on the UK Post-2010 Biodiversity Framework (formally the UK BAP) are also considered. Details on these species and habitats can be found at: http://jncc.defra.gov.uk/page-5705.

**Protected Sites**

A network of protected sites, at varying levels, have been put in place across the UK. Further details are provided below;

***International importance***

- Natura 2000

Natura 2000 is the name of the European Union-wide network of nature conservation sites established under the EC Habitats and Birds Directives. This network will comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

- Special Areas of Conservation (SAC)

SACs are designated under the EC Habitats Directive. The Directive applies to the UK and the overseas territory of Gibraltar. SACs are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs in terrestrial areas and territorial marine waters out to 12 nautical miles are designated under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). New and/or amended Habitats Regulations are shortly to be introduced to provide a mechanism for the designation of SACs and SPAs in UK offshore waters (from 12-200 nm).

***National importance***

- Sites of Special Scientific Interest (SSSI)

The SSSI series has developed since 1949 as the national suite of sites providing statutory protection for the best examples of the UK's flora, fauna, or geological or physiographical features. Most SSSIs are privately-owned or managed; others are owned or managed by public bodies or non-government organisations. The SSSIs designation may extend into intertidal areas out to the jurisdictional limit of local authorities, generally Mean Low Water in England and Northern Ireland; Mean Low Water of Spring tides in Scotland. In Wales, the limit is Mean Low Water for SSSIs notified before 2002, and, for more recent notifications, the limit of Lowest Astronomical Tides, where the features of interest extend down to LAT. There is no provision for marine SSSIs beyond low water mark. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs have been renotified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and the Nature Conservation (Scotland) Act 2004.

***Regional/local importance***

- Wildlife Sites

Local authorities for any given area may designate certain areas as being of local conservation interest. The criteria for inclusion, and the level of protection provided, if any, may vary between areas. Most individual counties have a similar scheme, although they do vary. These sites, which may be given various titles such as 'Listed Wildlife Sites' (LWS), 'County Wildlife Sites' (CWS), 'Local Nature Conservation Sites' (LNCS), 'Sites of Importance for Nature Conservation' (SINCs), or Sites of Nature Conservation Importance' (SNCIs), together with statutory designations, are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined.

## APPENDIX C : Methodologies

### Assessment Method for Bats

Following current good practice guidelines (Collins (ed) 2016), the assessment comprised a visual inspection of each of the trees and built structures, for the latter including any internal areas such as roof voids or cellars. For ease of reference, each structure was numbered B1, B2, B3 etc and trees were numbered T1, T2, T3 etc.

The location and description of any features such as holes, crevices or internal voids that could potentially be used by roosting bats was recorded and a search was made for any evidence of bat presence such as droppings or feeding remains. Binoculars, ladders, high powered torches and endoscopes were used where necessary to facilitate more detailed inspection of individual features.

Based on the number, location and type of any potential roost features, structures and trees were categorised as having negligible, low, moderate or high potential for roosting bats, or confirmed roost where direct evidence of bat presence was encountered. Evaluation of roost potential is necessarily subjective and relies on the professional judgment of the surveyor; however, the table below provides a useful guide to how this is informed.

**Examples of characteristics that inform assessment of roost potential**

| Status | Typical characteristics |
|---|---|
| Negligible potential | • Modern construction / immature trees<br>• Lack of access points for bats<br>• Situated within very poor quality foraging habitat<br>• High levels of external lighting |
| Low potential | • Small number of minor hole / crevice features suitable for opportunistic roosting<br>• Lack of roof voids or small cluttered roof spaces<br>• Features obscured by dense cobwebs<br>• Unlikely to support breeding or hibernating bats<br>• Situated within poor quality foraging habitat |
| Moderate potential | • One or more hole / crevice features suitable for roosting, e.g. damaged soffits, uneven roof tiles<br>• Access into large, dark internal spaces such as roof voids<br>• Trees with small fissures and crevices in dead wood suitable for day roosting<br>• Situated within or near to moderate/good quality foraging habitat |

| Status | Typical characteristics |
|---|---|
| High potential | • Old buildings / mature or veteran trees<br>• Trees with woodpecker holes or deep fissures and crevices in dead wood<br>• Structures with large, uncluttered roof voids<br>• Traditional brick, stone or timber framed barns<br>• Features suitable for large numbers of bats and/or several different species<br>• Types of structure suitable for hibernation, e.g.caves, tunnels, ice houses etc<br>• Low level of disturbance by humans<br>• Little / no external lighting<br>• Situated within good quality foraging habitat |
| Confirmed Roost | Bats seen or heard within the roost feature during the survey<br>Bat droppings, particularly if piled rather than scattered<br>Feeding remains such as moth wings<br>Existing record of roost at that location |

**Guidance for assessing the overall value of potential development sites for bats (Collins (ed), 2016)**

| Site Status | Description |
|---|---|
| Increasing site value for bats ↓ | • No features likely to be used by bats<br>• Small number of potential roost sites but unlikely to be suitable for maternity roosts or hibernacula<br>• Isolated habitat that could be used by foraging bats<br>• Isolated site not connected by prominent linear features to suitable other/adjacent foraging habitats<br>• Several potential roost sites in buildings, trees or other structures<br>• Habitat suitable for foraging bats (e.g. trees, water, scrub, grassland present)<br>• Site is connected with the wider landscape by features that could be used by foraging/commuting bats (e.g. gardens backed by scrub or line of trees)<br>• Buildings, trees or other structures (e.g. caves or underground structures) of particular significance for roosting bats<br>• Site includes high quality foraging habitat (e.g. broadleaved woodland, tree-lined watercourses, parkland with mature trees and rough grass)<br>• Site is connected with the wider landscape by strong linear features that could be used by commuting bats (e.g. hedgerows, river valleys)<br>• Site is close to known roosts<br>• Bats recorded or observed using an area for foraging or commuting close to a potential roost |

## APPENDIX D : Botanical Species Lists

| Latin Name | Common Name | DAFOR | | | | | |
|---|---|---|---|---|---|---|---|
| | | SI Grsld | Tall Ruderal | D1 | H1 | H/D2 | Arable Field |
| **Trees and shrubs** | | | | | | | |
| *Corylus avellana* | Hazel | | | | R | | |
| *Crataegus monogyna* | Hawthorn | | | | D | R | |
| *Rubus fruticosus* | Bramble | | | | | | |
| *Salix sp.* | Willow species | R | | | | | |
| *Ulmus procera* | English elm | | | | | D | |
| | | | | | | | |
| **Grasses and forbs** | | | | | | | |
| *Achillea millefolium* | Yarrow | F | | | | | |
| *Anagallis arvensis* | Scarlet pimpernel | F | O | | | | |
| *Angelica sylvestris* | Angelica | | R | | | | |
| *Arrhenatherum elatius* | False oat-grass | | | | | F | |
| *Calystegia sepium* | Hedge bindweed | | R | | | | |
| *Chenopodium sp.* | Goosefoot | O | | | | | |
| *Cirsium arvense* | Creeping thistle | F-LA | F | | | | |
| *Cirsium vulgare* | Spear thistle | R | | | | | |
| *Daucus carota* | Wild carrot | | R | | | | |
| *Epilobium sp.* | Willowherb species | | | | | | |
| *Erodium cicutarium* | Storks-bill | R | | | | | |
| *Euphorbia sp.* | Spurge species | O | | | | | |
| *Holcus lanatus* | Yorkshire fog | F | | | | | |
| *Lamium purpureum* | Red dead-nettle | | O | | | | |
| *Lathyrus pratensis* | Meadow vetchling | | R | | | | |
| *Leucanthemum vulgare* | Ox-eye daisy | O-F | | | | | |
| *Lolium perenne* | Perennial rye-grass | F | | | | | D |
| *Lotus corniculatus* | Common Bird's-foot-trefoil | O | | | | | |
| *Lythrum salicaria* | Purple-loosestrife | R | | | | | |
| *Matricaria sp.* | Mayweed species | O | O | | | | |
| *Medicago lupinus* | Black medick | O | R | | | | |
| *Persicaria maculosa* | Redshank | F | O | | | | |

| Latin Name | Common Name | DAFOR | | | | | |
|---|---|---|---|---|---|---|---|
| | | SI Grsld | Tall Ruderal | D1 | H1 | H/D2 | Arable Field |
| *Phragmites australis* | Common reed | R | O | O | | | |
| *Plantago lanceolata* | Ribwort Plantain | F | | | | | |
| *Potentilla reptans* | Creeping cinquefoil | O | | | | | |
| *Ranunculus repens* | Creeping buttercup | O | O | | | | |
| *Ranunculus sceleratus* | Celery-leaved buttercup | | R | R | | | |
| *Reseda luteola* | Weld | R | | | | | |
| *Rumex crispus* | Curled dock | O | | | | | |
| *Rumex obtusifolius* | Broad-leaved dock | | O | | | | |
| *Senecio vulgaris* | Groundsel | O | | | | | |
| *Solanum dulcamara* | Bittersweet | | | O | | | |
| *Sonchus sp.* | Sow thistle species | O | | | | | |
| *Trifolium repens* | White Clover | O | | | | | |
| *Urtica dioica* | Common nettle | O | R | | | | |
| *Vicia cracca* | Tufted-vetch | | O | | | | |

DAFOR Key: D = Dominant (>75%), A = Abundant (51-75%), F = Frequent (26-50%), O = Occasional (11-25%), R = Rare (1-10%), L = Locally

## APPENDIX E : Site Photographs

| No. | Description | Photograph |
|---|---|---|
| 1 | Establishing grassland in route of access road at western end (Area 1) |  |
| 2 | Car park with adjacent ditch in central area |  |
| 3 | Ditch 1 and Hedge 1 with disturbed tall ruderal vegetation in foreground |  |
| 4 | Approximate route across field |  |

| No. | Description | Photograph |
|---|---|---|
| 5 | Approximate route through Ditch 2 and Hedge 2 |  |
| 6 | Ditch/Hedge 2 |  |

# APPENDIX D HAUL ROAD CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN





TerraConsult

**September 2019**
**Report No 4686R001-3**

# RAILWAY WHARF, KEADBY

# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

**Prepared for:**

[redacted]

# RAILWAY WHARF, KEADBY

# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

**Date: September 2019**

**Report No 4686R001-3**

**Prepared for:**

[redacted]

**Lead Designer:**

[redacted]

**By:**

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[redacted]

# DOCUMENT INFORMATION AND CONTROL SHEET

## Document Status and Approval Schedule

| Report No. | Title |
|---|---|
| 4686R001-3 | RAILWAY WHARF, KEADBY<br>CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN |

| | | | |
|---|---|---|---|
| **Prepared by:** | **Ralph Sibley** | | |
| **Approved by:** | **Louise Stock** | | |
| **Date:** | **06 September 2019** | | |

| Issue: | Date: | Description: | Prepared by: |
|---|---|---|---|
| 1 | 06 September 2019 | Draft for client comment (excludes sub surveys) | RDS |
| 2 | 09 September 2019 | Final | JL/LS |
| 3 | 07 November 2019 | Final | PW/LS |

# RAILWAY WHARF, KEADBY

# CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

## CONTENTS

## DRAWINGS

L1057-0001-01 – Crane Foundation Layout
L1057-0002-01 – Crane Foundation Layout – Reinforced Concrete Area Plan
L1057-0003-01 – Crane Foundation Layout – Reinforced Concrete Area Section
L1057-0004-01 – Crane Foundation Layout – Piling General Arrangement

## APPENDICES

APPENDIX A Daily and Weekly Record Sheets

APPENDIX B [redacted]Site Set Up and HSQE File

APPENDIX C Emergency Response Plan

APPENDIX D Traffic Management Plan

APPENDIX E Flood Risk

APPENDIX F Ecology

APPENDIX G Piling Risk Assessment

APPENDIX H Water Services Plan

# RAILWAY WHARF, KEADBY

# CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

## 1 INTRODUCTION

### 1.1 General Background

[redacted] has been appointed to undertake construction work, at the subject site, Railway Wharf, Keadby, in Lincolnshire.

XXX (TBC) will be the Principal Contractor responsible for carrying out the construction works at the site.

The proposed works at the site comprise the construction of a new foundation to support a large crane that will be used to offload equipment from vessels moored in the adjacent River Trent and place them on to specialised multi-axle vehicles for onward transportation to the nearby Keadby Power Station site.

This Construction Environmental Management Plan (CEMP) details the environmental monitoring and mitigating measures that are to be implemented during the construction works to minimize the effects of the site operations on environmental receptors, including human health and controlled waters.

This document should be read in conjunction with the following:

- Detailed Description of Works; reference L1057/MEM/003 Rev00, by [redacted] dated 26/7/19;
- Specification for Piling and Embedded Retaining Walls; reference L01057-GEO-SPEC-01, by [redacted] dated 8 August 2019;
- Station Road – [redacted] TM Plan 2 Way Traffic Signals; drawing number HATTON-TM-DON-2019-257; and,
- Railway Wharf (Keadby) Emergency Response Plan; reference AA6039-03-K2 CGGT; dated 16/08/19.
- Keadby Wharf Crane Pad Construction Flood Risk Assessment; reference 0521984 by Environmental Resources Management Ltd, dated 3 September 2019;
- Keadby Wharf Crane Pad Construction Noise and Vibration Assessment; reference 0521984, by Environmental Resources Management Ltd, dated 3 September 2019;
  Keadby Wharf Crane Pad Construction Ecological Appraisal; reference 0521984, by Environmental Resources Management Ltd, dated 3 September 2019.

### 1.2 Rationale and Scope of Works

The existing construction of the quay side at Railway Wharf consists of a reinforced concrete ground-bearing slab. The quay edge itself is constructed from a steel sheet pile wall with a concrete capping beam. The sheet pile wall has some anchor/tie bars which are bolted through the face of the wall and extend back underground – presumably to a “dead man anchor” at some point away from the quay wall.

When vertical loads are applied to soil that is retained, they also generate a horizontal pressure on the back of the wall. The size of this horizontal pressure is dependent on the

magnitude, position and arrangement of the load itself. The front legs of the crane are approximately 2m from the quay edge and the heavy loads that they transmit into the ground will generate horizontal pressures that are too great to be safely resisted by the existing wall construction. Therefore, the proposed solution is to support those front legs on new piled foundations. The piles will transfer the vertical load from the crane outriggers safely into the ground below and will effectively not generate any lateral pressures on the wall.
Given the underlying ground conditions, hydrogeology and site setting, a piling risk assessment is likely to be required by the Environment Agency.

[redacted] has been tasked with the construction of the proposed crane foundation, which is to comprise CFA piles and large pile caps to provide support to the outriggers of the crane.

It is envisaged that reinforced concrete ('RC') works would be carried out in the manner as described below. It is assumed that some form of exploration works will be carried out to determine the position and line of the anchor bars so that they can be marked on site and avoided during the piling works.

The main elements of the Works are:

- Break up existing slab in areas of new pile caps;
- Install piling construction platform (layer of graded stone) over area for piling rig operations; this is to be provided unless it can be proven that the existing slab is capable of carrying the piling rig loads and pressures;
- Install new RC piles as required by the design. It is envisaged that Continuous Flight Auger (CFA) piles will be used on this project. These are formed by drilling the auger into the required depth, then as the auger is removed, concrete is pumped in. When the auger is fully removed, and while the concrete is still wet, a reinforcing cage is inserted;
- Temporary soil support (e.g. trench sheets) are installed around the edges of the pile caps and the ground within is excavated down to the required formation level;
- At this point the piles themselves are trimmed down to the required design height (cut-off level);
- The reinforcement cage for the pile caps is fixed on top of the piles. Where necessary new reinforcing bars will be drilled and fixed into the cut side face of the existing RC slab to tie it into the new pile cap;
- Concrete is poured to form the new pile cap. The top of concrete level will match that of the surrounding concrete; and,
- Once the pile cap has sufficiently cured/set it can be loaded with the crane outriggers.

# 2 SITE SETTING

## 2.1 Site Location and Description

| | |
|---|---|
| **Site Address** | Trent Side, Keadby, Scunthorpe DN17 |
| **National Grid Reference** | 483500, 411400 |
| **Site Setting** | North west: Trent Side (B1392 road) with commercial/ industrial developments beyond;<br>East: River Trent;<br>South: Stainforth and Keadby Canal, with locks, and wharf beyond. |
| **Site Description** | The site is currently a wharf, predominantly concrete-surfaced and located immediately north west of the junction of the River Trent and the Stainforth and Keadby Canal; the eastern boundary comprises the existing wharf. Several one/two storey buildings are located in the southern section of the site.<br><br>The site is currently ostensibly flat and level, except for a low grassed bund (flood defence?) along the north western margin, with the road beyond.<br><br>The proposed crane spreader bases are to be located in the eastern margin of the site adjoining the river. |

A site location plan is presented as Figure 1.

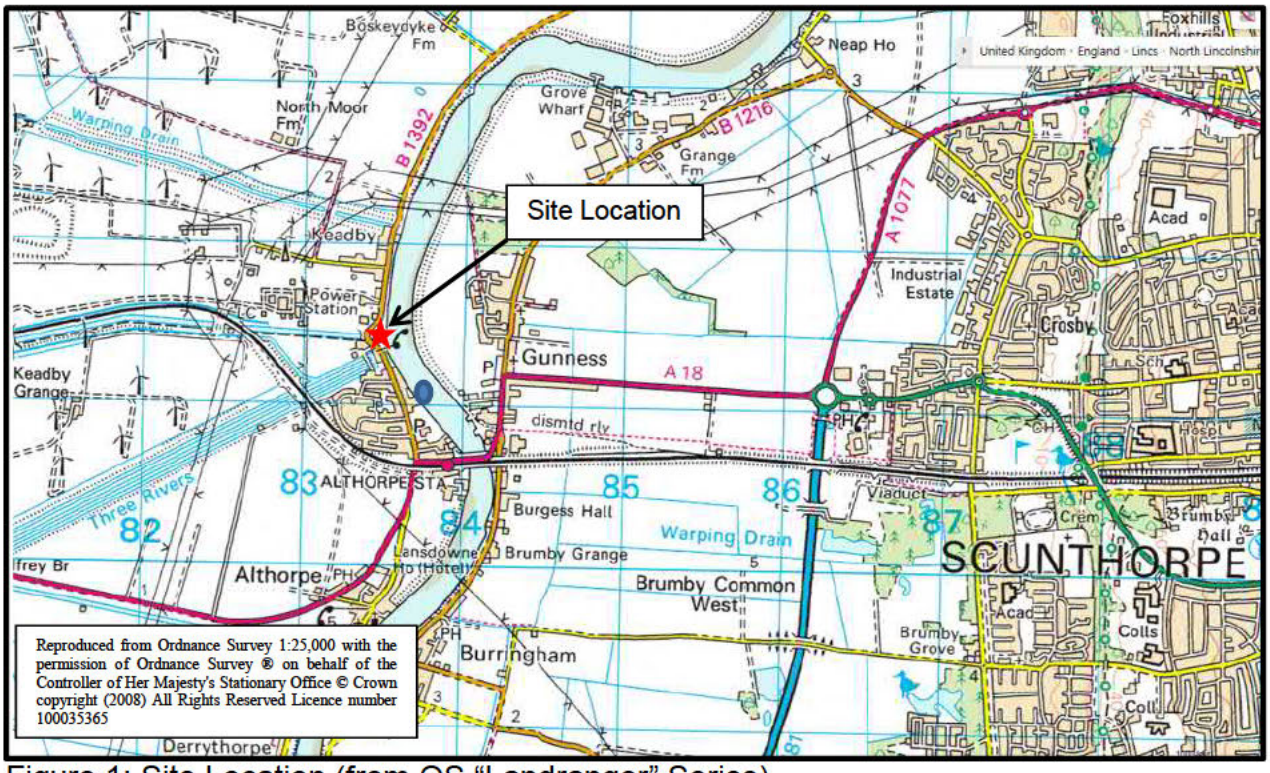


Figure 1: Site Location (from OS "Landranger" Series).

The current site layout is shown on the plan presented as Figure 2.

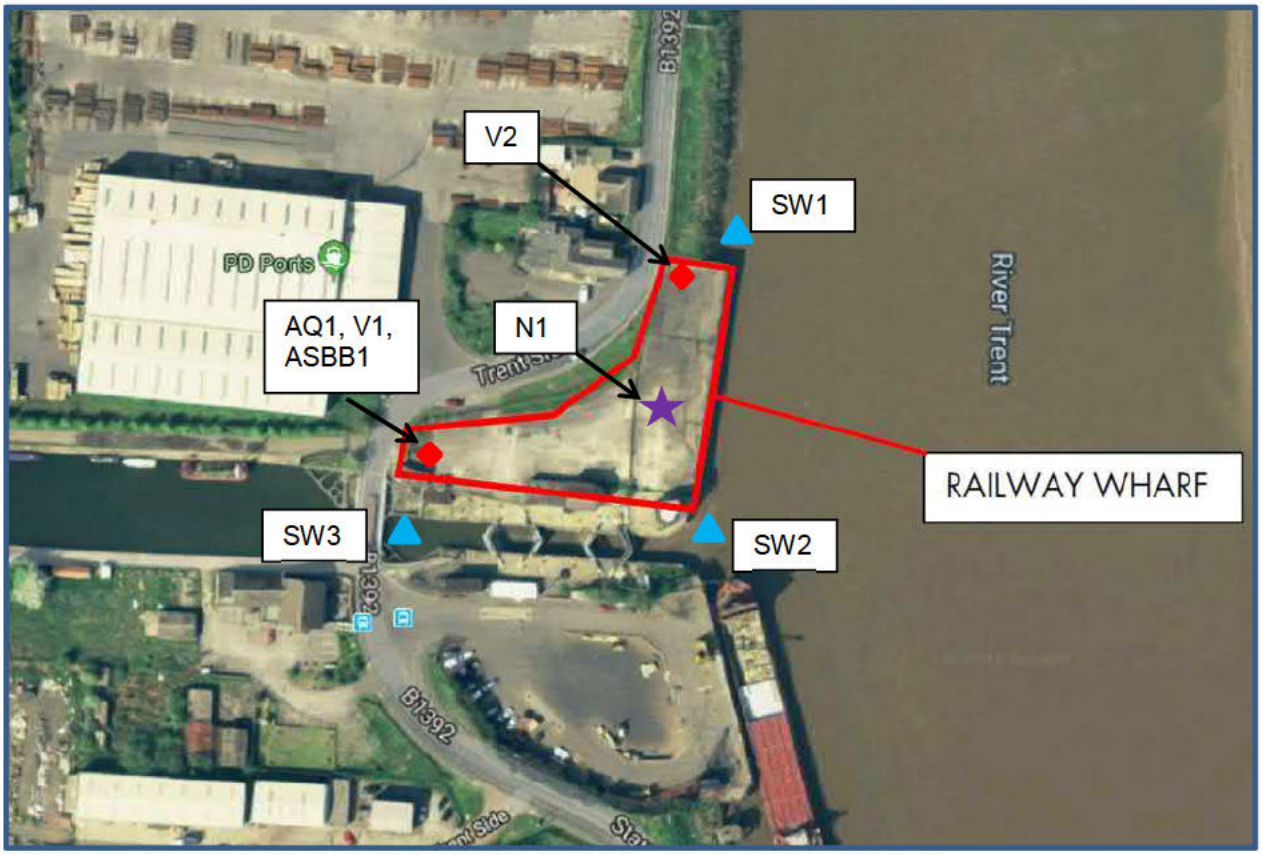



Figure 2: Current site layout (satellite image) – for key see Table 1

## 2.2 Proposed Development

As previously described, the proposed works at the site comprise the installation of CFA piles and large pile caps in the existing wharf/quayside, to create new foundations to provide support outriggers of the crane that will be used to offload heavy pieces of equipment from vessels moored in the River Trent.

The equipment will then be placed onto specialised multi-axle vehicles for onward transportation to the nearby Keadby Power Station site. This is located some 500m to the west of the subject site.

The proposed development layout is shown on the site plan presented as Figure 3.

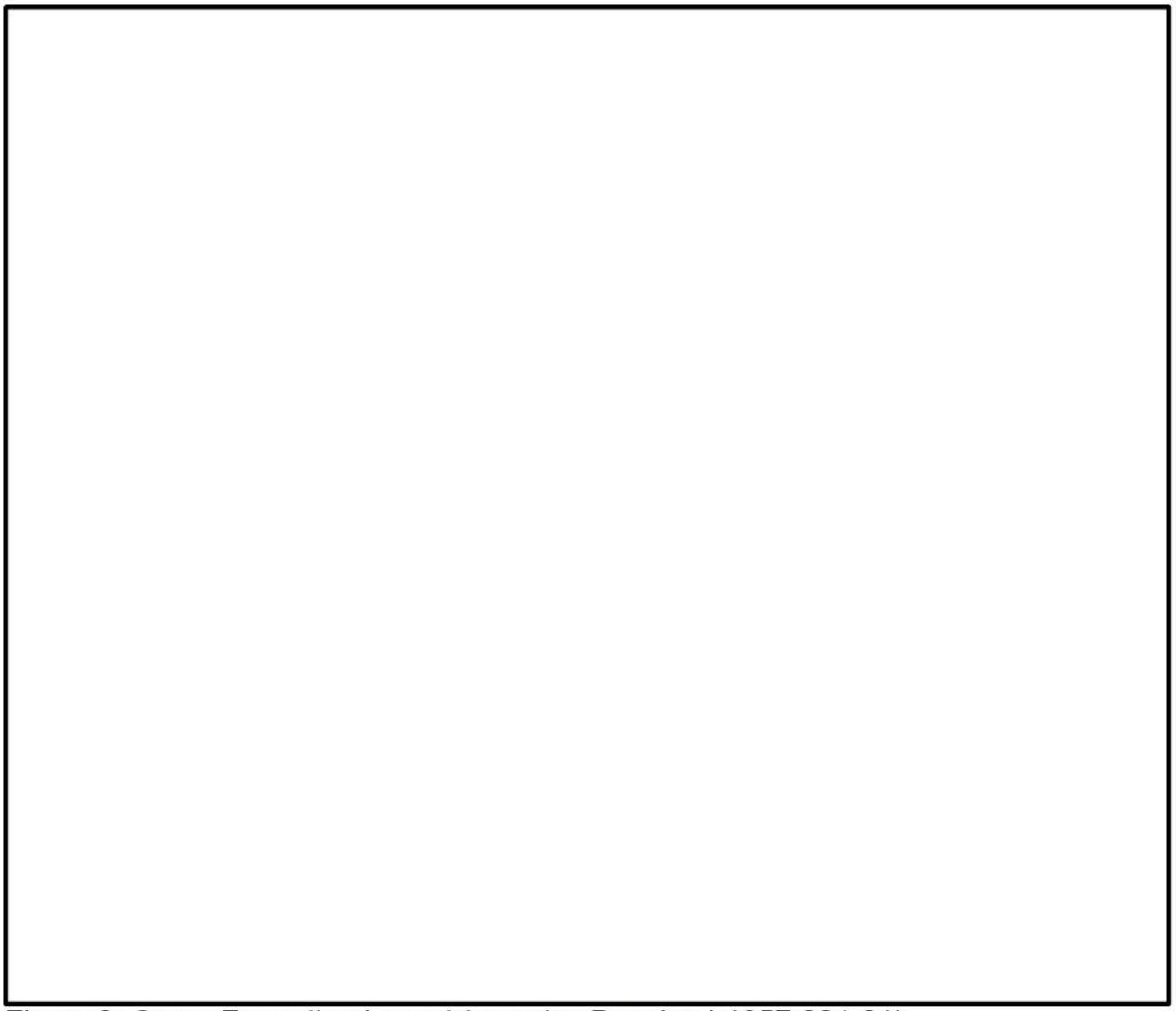


Figure 3: Crane Formation Layout (see also Drawing L1057-001-01)

## 2.3 Key Parties and Personnel

| | |
|---|---|
| **Client** | [redacted] |
| **Address** | |
| **Contact** | |

| | |
|---|---|
| **Site Owner** | [redacted] |
| **Telephone No** | |
| **Email** | |

| | |
|---|---|
| **Environmental Consultant** | [redacted] |
| **Project Manager** | |
| **Address** | |
| **Telephone No** | |
| **Email** | |

| | |
|---|---|
| **Ecologist** | TBC |
| **Project Manager** | TBC |
| **Telephone No** | TBC |
| **Email** | TBC |

| | | |
|---|---|---|
| **Site Principal Contractor** | TBC | |
| **Contractor Lead Contact** | TBC | |
| **Site Manager** | TBC | Tel: TBC |
| **Health and Safety Coordinator** | TBC | Tel: TBC |
| **Fire Safety Coordinator** | TBC | Tel: TBC |
| **Recycling / Waste Coordinator** | | Tel: TBC |
| **Site Telephone No.** | TBC | |
| **Site Email** | TBC | |

# 3 ENVIRONMENTAL MONITORING AND SAMPLING

## 3.1 Environmental Monitoring

The main areas covered by this Construction Environmental Management Plan will comprise the following; baseline monitoring will be carried out and mitigation measures will be implemented prior to commencing the Works.

- Pollution, to include surface water quality in the adjacent watercourses;
- Air quality to include dust, volatile organic compounds and airborne asbestos fibres;
- Vibration;
- Noise; and,
- Ecology.

Measurements will be undertaken using real time/visual methods during periods when excavation and ground works (including piling) are being undertaken, and monitoring frequencies are likely to be increased depending on the nature of on-site works. Air quality monitoring will be on a continuous basis; asbestos monitoring (if required) will be on an 8 hour cycle.

These methods have their limitations in terms of accuracy, limits of detection and ability to differentiate between compounds, but are required to assess compliance with short-term exposure standards and address problems early on - timely action can be taken to prevent complaints and avoid causing concern for those working in the vicinity of the site.

Within the site boundary, dust monitoring shall be carried out by the use of a visual assessment of fugitive dust emissions, and a subjective assessment of odour strength and character at offsite locations will be undertaken.

A summary of the environmental monitoring is presented in Table 1 below and proposed monitoring points indicated on the plan presented as Figure 2.

**Table 1 Summary of Environmental Monitoring and Sampling**

| Activity | Locality | Number of Monitoring Points | Location Reference | Frequency | Notes |
|---|---|---|---|---|---|
| Air Quality | Site-wide | 1 (AQ1) | Site Entrance | Daily/Continuous | Visual inspection during dry periods |
| Asbestos in Air | Personal air monitoring pumps at activity locations, | 2 (ASBPER1, ASBPER2,) | 2 no. site workers working directly on platform development | Daily initially. Frequency to be reassessed depending upon initial results | |
| | Site boundary | 1 (ASBB1, | Site Entrance (same location as per AQ1 | | |
| Vibration | Site boundaries | 2 (V1, V2) | Western and northern site margins | Daily/Continuous | Measurement and evaluation of vibration shall be in accordance with the guidance given in BS 7385 Part 1 for 'control' monitoring, during piling works |
| Noise | Site-wide | 1 (N1) | Adjacent to piling rig / construction plant | Daily | Recorded by hand held sound level meter. Proposed target noise levels not to exceed 65dB at site boundaries |
| Pollution | Surface water | 3 (SW1 - 3) | Upstream and downstream of site within River Trent and Stainforth and Keadby Canal | Pre start and once a week thereafter | Water sampled/tested and visual inspections |

[redacted] will install a portable weather station with data logging capacity in the site office to monitor daily wind speed and direction, barometric pressure, temperature and rainfall in order to assess parameters which are likely to affect pollutant emissions from the proposed works.

All field monitoring data and laboratory results will be provided in pdf and Excel format and will be added to the single dataset of analytical results for the site. Results will be compared with earlier results for the same locations to National/European Air Quality Standards. Where no standards are available, long-term exposure standards are derived from other sources, e.g.:

- Environment Agency/ Defra Contaminated Land TOX reports for inhalation TDI's
- WHO Air Quality Guidelines for Europe
- US EPA Integrated Risk Information System

If any significant variations arise, an explanation will be sought and the Project Manager will within 24hrs make available the findings to the Client, and North Lincolnshire Council (NLC).

### 3.2 Daily Environmental Records

The Daily Environmental Record (DER) is a generic document to be used in relation to this project; see blank copy attached.

The DER has been tailored to the specifics of this project include site information together with the additional (non-exhaustive) items:

- Daily checks/remedial measures to safety fencing/barriers and site hoarding;
- Weather forecasting information, current weather conditions and actions taken to reduce potential for nuisance;
- Noise monitoring at pre-determined locations;
- Daily checks for rutting or mud/dust on public highway leading to site;
- Odour monitoring in relation to excavation of unforeseen contamination;
- Details of monitoring for impact on adjacent surface watercourses, including upstream and downstream monitoring results;
- Daily plant inspection records

The DER will be developed to provide a comprehensive and auditable record of operations on site.

The DER would be made available to the Client and EA as required.

Daily and weekly environmental records will be maintained by [redacted] during the entire duration of the site works and copies of the daily and weekly record sheets are included in Appendix A.

## 4 OPERATIONAL CONTROL MEASURES

### 4.1 Piling

The proposed piling works will involve penetration through Alluvium (Secondary A Aquifer) into strata of the Mercia Mudstone (Secondary B Aquifer). Therefore a piling risk assessment will need to be prepared and followed to mitigate risks of pollution impact on groundwater beneath the site. Currently the proposed method of pile construction is to be via continuous flight auger (CFA) which is recognised as being the most effective technique in mitigating risks of polluting and/or creating migration pathways to deep aquifers.

### 4.2 Surface Water Control

Measures will be put in place to ensure that the risk of surface water runoff across site boundaries and into adjoining watercourses is minimised. Where necessary, measures such as silt fences or surface water containment bunds will be used to prevent uncontrolled run-off containing elevated suspended solids and/or contaminated soils/fluids being discharged from the site.

Surface water generated from precipitation at the site shall be used for dust suppression; however any surplus water will require a discharge consent in order to dispose of water to sewer. It shall be responsibility to obtain such consent, and no discharge to sewer shall be undertaken without written confirmation of such consent from the utility supplier (Anglian Water).

## 4.3 Air Quality

In order to mitigate the impact of dust and noise activities, site-specific measures will be implemented in accordance with GLA best practice guidelines.

A Method Statement and associated Risk Assessment (RAMS) will be developed for all activities involved in the remedial works and these measures will be incorporated in the Works.

All personnel will be reminded of good practice and standards through a series of “Toolbox Talks” and Safety Inductions.

## 4.4 Noise and Vibration

Environmental Resources Management Ltd (ERM) has undertaken a Noise and Vibration Assessment (FRA), dated 3 September 2019, to accompany the planning application for the construction of the wharf reinforcement works.

ERM has concluded that:

- This assessment considers noise and vibration impacts from the construction and temporary use of the Railway Wharf to deliver abnormal loads during construction of the Keadby 2 Power Station Project. The total duration of piling works is expected to be only 10 days;
- During concrete breaking works, an exceedance of the criterion of up to 10 dB during the daytime is predicted at the nearest NSR 2;
- Mitigation is predicted to reduce the level of exceedance at NSR 2 to 6 dB. Works are expected to last only for a brief period of a few days and therefore these impacts are not considered significant;
- During piling works, an exceedance of up to 7 dB during the daytime is predicted at one location; NSR 2. Mitigation is predicted to reduce this exceedance to 3 dB. As the total duration of construction works is expected to be only 10 days, this impact is not considered significant;
- No significant noise and vibration effects or cumulative effects are predicted at other times or at other NSRs.

Prior to the site works commencing temporary site hoarding will be erected, as required, around the perimeter of the site to secure the site boundary.

All vehicles and mechanical plant used for the purpose of the Works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient works order.

All compressors shall be `sound reduced’ models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all ancillary pneumatic percussions tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers.

Machines in intermittent use shall be shut down in the intervening periods between work or throttled down to a minimum and plant and vehicles started up sequentially rather than all together.

Onsite and offsite monitoring of noise levels will be monitored regularly.

Site activities will be restricted to site working hours approved by the Planning Authority and noted in the Planning conditions as detailed in Section 4.15.

[redacted]shall as far as reasonably practicable, not exceed the vibration dose values as specified in BS 6472: Part 1: 2008. As a minimum, Technical Staff shall take noise readings at the pre-determined locations daily.

In order to mitigate the impact of noise and vibration activities, site specific measures in accordance with Best Practicable Means (BPM) will be implemented and shall include the following:

- Traffic Management and access control as detailed; with plan to be located in prominent area of site offices;
- Scheduling of construction delivery vehicles to least noise sensitive times of the day;
- Time slots for deliveries (minimized) to ensure that convoys of vehicles do not arrive simultaneously;
- Strict control to prevent temporary parking on kerb side in the vicinity of noise sensitive roads in close proximity to the site;
- The use of sufficient clear signage to ensure that construction vehicles use only the designated routes;

Regular communication will be maintained with the Local Highways officials for the entire duration of the works and a complaint number and contact person shall be provided in the event of any incident occurring.

A RAMS will be developed for all activities involved in the earthworks and these measures will be incorporated in the Works.

All personnel will be reminded of good practice and standards through a series of "Toolbox Talks" and Safety Inductions.

## 4.5 Materials generated from ground works' activities

The proposed (ground) works at the site is expected to generate a limited quantity of materials over a short time frame, during peak construction activities, which will require off-site removal. These materials comprise/include:

- Material/detritus cleared from the existing concrete deck and site including broken out concrete and underlying sub-base materials;
- soil arisings from boring/piling activities; and
- broken concrete/rebar from the pile cap positions.

These materials will be visually inspected, segregated and temporarily stockpiled on site before being removed for disposal in accordance with the Environment Protection Act 1990,

the landfill (England and Wales) Regulations 2002, Environmental Permitting (England & Wales) Regulations Amendment no.2 2018, and any other relevant statutory guidance.

All materials that are to be removed to landfill will undergo appropriate Waste Acceptance Classification (WAC) testing prior to removal to landfill at the appropriate classification.

Any ground materials that are generated, that are suspected to be contaminated, will be segregated, stockpiled (under cover and bunded to prevent run-off of leachate) sampled and tested. From the results of the testing, the appropriate classification and destination for disposal will be determined.

### 4.6 Fuel Storage and Vehicle Re-fuelling

Under the Environment Agency's Oil Storage Regulations of 2001 (England), storage containers with a capacity of 200 litres or more (at an institute, a commercial or an industrial site) or capacity of 3500 litres or more (at a domestic dwelling), must be stored in a bunded tank, bowser or other container, such as a drum

[redacted] will ensure that any fuel required for plant shall be stored in double-bunded tanks, which are to be placed within areas of bunded impermeable surfacing. Refuelling shall be undertaken such that any spillage is collected on a spill tray and disposed off-site. Toolbox talks shall be held by [redacted] in order to ensure that the operatives are fully aware of correct refuelling procedures. Any spillages shall be reported immediately to the Project Manager, immediately cleared and cleaned in an approved manner and any contaminated sub-soil immediately removed.

### 4.7 Mud Control

For the duration of the Works [redacted] shall deploy a jet washing unit to facilitate washing down of the wheels of vehicles leaving site as required. This shall be positioned adjacent to the site entrance so that the vehicles exiting this facility do so on to clean, hard surfacing asphalt leading directly onto Trent Side. All vehicles exiting site shall do so through the jet wash (if required) and the deployed banks-man/gateman shall keep records of such.

[redacted] shall ensure that mud is not deposited on Trent Side/adjoining highways as a result of the works. In the event of this occurring, appropriate mitigation measures shall be taken. A road-sweeping vehicle shall be employed as necessary.

A boot wash facility is to be put in place, where possible, to prevent site debris from littering the public footpaths leading up to the site. Alternatively, a pressure washer and manual brooms should be used at least once a day, or as necessary, to clean the footpaths of any debris from the site.

Good housekeeping practice, if properly applied, will greatly reduce waste or debris littering the public road. This in turn will reduce the need for cleaning of public areas.

### 4.8 Highways Defect Monitoring

[redacted] shall carry out a dilapidation survey along the existing highways in the immediate vicinity of the working area and access routes for deliveries to record all defects prior to the works commencing on site. This information shall be held on site and for the duration of the Works shall carry out daily checks for defects such as rutting of the pavement surface. In the

event that this occurs as a result of vehicular traffic [redacted] shall immediately notify the local Highways Department and carry out repairs to the affected area.

## 4.9 Gas and Fires

[redacted] shall take measures to ensure gaseous emissions from all plant, fuel etc. are minimised. All gas and flammable liquid materials required for the construction works are to be kept in a bunded COSHH store at the site.

In the event of odour nuisance levels being identified on the site boundary (none known at the time of writing), remedial measures shall be taken including the immediate removal or covering or control of odour sources.

[redacted] shall ensure the lighting of fires is prohibited at all times. Notices to this effect shall be erected and maintained at appropriate locations.

Prior notice shall be given of any intention to use welding equipment (Temporary Works).

Smoking on site will only be permitted in the designated zone.

## 4.10 Air Quality Requirements

Acceptable levels for the air quality environmental monitoring have been specified in Section 4.10 Table 2. If these are exceeded, works will be investigated and actions taken to correct the situation.

## 4.11 Dust Control

Where materials are to be removed from site this operation shall be undertaken using covered vehicles, to minimise dust liberation.

Dust control measures shall be undertaken to the satisfaction of the Project Manager at all times and the Works will be stopped if acceptable measures are not in place or being utilised. Dust control measures will include as a minimum the damping down of the site with water during periods of dry weather and when piling and ground works are progressing in particular.

The following monitoring works shall be undertaken by [redacted]:

- Daily visual and dust diary;
- Weekly monitoring of dust site-wide and at receptor locations as shown on Figure 2;
- Occupational dust monitoring at down-wind (eastern) boundary of the site, for total inhalable and respirable dust.

Based on a subjective assessment, if dust levels are a nuisance site-wide especially at the site boundary, contingency measures for dust and odour control described in Section 4.14 shall be implemented.

Monitoring data will be compared to exposure standards, which form the basis of trigger levels will be used to re-assess working practices on site.

Trigger levels will be set according to 2 levels of control as follows:

- Level 1 - To protect workers on site, based on occupational exposure standards; parameters measured being close to or at the exposure standard. Action will be to investigate reason and modify on-going works.

- Level 2 - To protect nearby sensitive receptors; parameters above exposure standard. Action will be to stop site works, investigate reason and modify on-going works.

Acceptability levels to be compared with the site-wide environmental monitoring results should be agreed with the Local Authority prior to work commencing but as a minimum the following levels shall be adopted within this CEMP.

**Table 2 Environmental Monitoring Levels**

| Activity | Trigger Value | Source |
|---|---|---|
| Monitoring of dust ($PM_{10}$) - 24 hr mean | 50 $\mu g/m^3$ | UK AQS |
| Environmental monitoring of vapours (as benzene /naphthalene) | 5 $\mu g/m^3$ | EA H1 |
| Monitoring of airborne asbestos fibres | 0.1 $fm^3$ | HSG 248 |

## 4.12 Asbestos Containing Materials

The contractor did not find any evidence of suspected asbestos containing materials (ACM's) during site investigation through the hardstanding presently at site. It is recommended that site workers have asbestos awareness training, and if any suspected ACM's are encountered on site, appropriate measures are undertaken and samples are sent for asbestos detection and quantification.

## 4.13 Disposal of Contractor's Waste Material

[redacted] shall be responsible for the removal and disposal of soil arisings from its activities and, and these will be removed with the relevant waste transfer notes; see also Section 4.5.

[redacted] hall also be responsible for keeping all public and private roadways free from mud and other debris arising from their activities.

## 4.14 Ecology

Environmental Resources Management Ltd (ERM) have undertaken an Ecological Appraisal, dated 4 September 2019, to accompany the planning application for the construction of the wharf reinforcement works.

ERM assessed that:

- There will be no direct effects on the designations of the Humber Estuary;
- It is likely that some birds use the vegetation such as the banks of reeds adjoining the northern edge of the wharf throughout the year. A kingfisher (listed on the breeding bird assemblage of the Humber Estuary SSSI) was observed flying from an area of reeds during the site visit in late August. However, the works will take place over the winter months and hence will avoid the breeding bird season (March to October inclusive);
- No evidence of otter was observed, but as the vegetation bordering the wharf could not be accessed during the site visit, a qualified ecologist will conduct checks for Otter holts prior to works being undertaken at the Site. Free passage for otters moving along the river will be maintained;
- The works will not involve percussive piling and no significant propagation of noise into the water column is expected. Significant secondary effects on fish and other aquatic fauna species, including changes to their populations / distribution are, therefore, not predicted;
- Whilst the works will not involve any in-river construction work in the River Trent, or the Stainforth and Keadby Canal, boat movements to and from the wharf as part of the operation of the Proposed Development could carry the invasive species Azolla filiculoides. Measures to remove it from the water at Canal Mouth, to avoid its spread, will be discussed with the Environment Agency (EA); and,
- Adverse effects on the Humber Estuary SAC/Ramsar and / or significant effects on the Humber Estuary SSSI are not predicted.

### 4.15 Contingency Measures

[redacted] will deploy a standpipe, fire hose and a power washer with an adapted spray bar system to dampen down the works and consequently mitigate dust and ensure consistent moisture conditions.

### 4.16 Site Hours of Operation

Site work shall be undertaken between normal working hours of 0700AM and 1800PM, Mondays to Fridays, and on Saturdays between the hours of 0800AM and 1300PM.

### 4.17 Flood Risk Issues

Environmental Resources Management Ltd (ERM) has undertaken a Flood Risk Assessment (FRA), dated 3 September 2019, to accompany the planning application for the construction of the wharf reinforcement works.

ERM has concluded that:

- The Proposed Development, defined as 'Water Compatible Development' is suitable for its proposed location within Flood Zone 3 of the tidal River Trent;
- Once complete, there will be no change in the surface expression of the wharf or permeability of the surface and as such there will be no change in the nature of flows within this tidal reach of the River Trent, or surface water runoff, and consequently no change in the risk of flooding elsewhere;
- Given the proximity of the works to the River Trent, the excavation of piled foundations will not change groundwater flow patterns in any way that could increase flooding; and,

- Based on these observations, it can be concluded that the Proposed Development will not have any effect on existing flood risk at the site or within the wider area. The improvement to the wharf foundations could improve the longer-term structural integrity of the quay, which forms a part of the overall flood defence system, thereby providing a wider sustainability benefit.

# 5 HEALTH AND SAFETY

As an ISO18001 Accredited Contractor, all operations on the site will be undertaken in compliance with the Health & Safety Plan and in line with [redacted] Health and Safety systems and procedures.

The Contract Stage Health & Safety Plan for the entire site operations will be held by the Project Manager and will be provided for induction to all personnel on site.

Site set-up requirements and Health & Safety procedures are set out in a specific document, a copy of which is presented in Appendix B.

## 5.1 Principal Contractor Requirements

The Principal Contractor is to ensure that all obligations identified by the Construction (Design & Management) Regulations 2015 and other applicable legislation is complied with, notably:

- To develop a Construction Phase Health & Safety Plan;
- To carry out site inductions for all contractors and operators. These should include both site-specific and industry standard rules and regulations;
- Project Safety information is to be displayed at site access and egress points, as well as site offices and welfare areas. This should include PPE requirements and details of site Health and Safety managers;
- As required, to restrict site access to allow authorised persons only to enter the site by the use of site security;
- To obtain risk assessments and method statements from all contractors engaged to work on the project, particularly where they may impact on others;
- To maintain the Safety Notice Board and the display of all Statutory Notices;
- To procure the appointment of competent designers or contractors as far as is reasonably practicable through the use of the supply chain management process;
- To monitor the health and safety performance of persons and companies working on the Project;
- To maintain adequate levels of welfare facilities for the work force, including contractors; and,
- To encourage an open door policy and blame free safety culture in the reporting of hazards and useful work practices. The statutory requirement of all operatives to look after their own safety and not engage in activities which will put others at risk /cause them harm will be underlined.

## 5.2 Risk Assessment Method Statement

The Main Contractor is to prepare a Risk Assessment Method Statement (RAMS) prior to commencement of site works. All personnel who will be on site must be made aware of the RAMS through a formal induction. A copy of the RAMS should be available in the site office for anyone to access and refer to at any moment.

All personnel on site must sign in and out of site at the beginning and end of each working day.

## 5.3 Emergency Response Plan

## 5.4 Fire Safety

Each year there are hundreds of fires on construction sites, potentially putting the lives of workers and members of the public at risk. Fire safety in construction is about preventing fires from starting and ensuring people's safety if they do. The HSE has published a Fire Safety in Construction document (Second edition, published 2010). This document explains how everyone involved in construction projects can comply with their legal duties relating to fire risks. It is aimed at all those with a role for developing and managing construction sites, including clients and designers, and is relevant to all construction projects.

Appendices 3 and 4 of the "Fire Safety in Construction" document cover:

- Summary of basic precautions for all sites and additional precautions for higher risk sites; and,
- Who does what?

### Fire Risk Assessment

Legislation requires a suitable and sufficient fire risk assessment to be carried out by a responsible person (the employer or persons in control). The Regulatory Reform (Fire Safety) Order 2005 (FSO) places responsibility for compliance on the 'responsible person'. Article 3 defines the responsible person as:

- the employer (for a workplace to any extent under the employer's control); or
- A person who has control of a premises in connection with them carrying out any trade, business or other undertaking (for profit or not); or
- The owner, where the person in control of the premises does not have control in connection with the carrying on by that person of any trade, business or other undertaking.
- As with assessments of risk from other hazards, the fire risk assessment should be based on the following approach:
- Step 1 – Identify the hazards.
- Step 2 – Identify people at risk.
- Step 3 – Evaluate, remove, reduce and protect from risk.
- Step 4 – Record, plan, inform, instruct and train.
- Step 5 – Review.

**Fire Precautions**

The Fire Safety in Construction document outlines a number of precautions that should be considered within the fire risk assessment. This should be reviewed and incorporated into the site RAMS:

- Emergency signs must be clearly displayed and exit routes must be kept clear;
- Fire alarms must be fully functional with routine (weekly) checks and tests by a nominated and competent person;
- Sufficient and appropriate fire-fighting equipment should be available on site to deal with all potential fire hazards presented by the site;
- For a typical spread of fire hazards, the following is considered to provide a reasonable level of cover per 200 m2 of floor area, with no fewer than two each of (a) and (b) on each floor:
    - One 9 litre water or foam; and
    - One CO2 extinguisher (at least 1.1 kg).
- Emergency escape lighting should be installed to illuminate escape routes, fire-fighting equipment and emergency signage;
- Fire notices should be concise and clearly displayed across the site. Notices should include as a minimum:
    - Details of how to raise the alarm (e.g. "Shout 'Fire'");
    - Contact number for fire service (day and night);
    - Location of emergency assembly point; and,
    - Name of site Fire Safety Coordinator / Fire Warden.

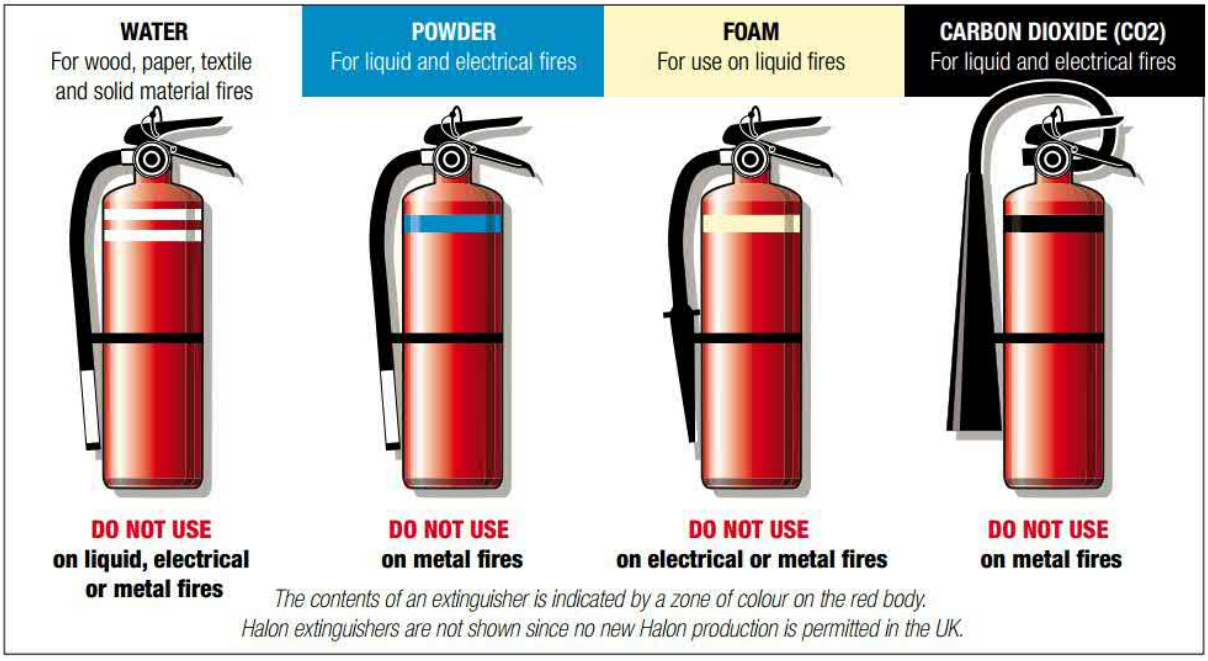



**Figure C.2 - A selection of fire extinguishers. Fire extinguishers complying with BS EN 3 are red with a coloured zone identifying the extinguishing agent (e.g. blue for dry powder)**

### Legal and enforcement responsibilities

Several pieces of legislation govern fire safety for construction sites and construction activities. The overarching health and safety requirements during construction work, which include fire safety, are provided by the Construction (Design and Management) Regulations 2015.

Other legislation covering fire safety includes:

- The Regulatory Reform (Fire Safety) Order 2005 (FSO) in England and Wales;
- The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR);
- Fire Safety (Employee's Capabilities) (England) Regulations 2010. (These Regulations require that employers must take account of an employee's capabilities as regards fire safety in entrusting tasks to them.)

These make detailed requirements for fire safety, which also apply to work incidental to the construction activity, e.g. provision of office and welfare facilities.

## 5.5 Site Rules and Regulations

The site will be managed by a full time project management team which will be responsible for the Health and Safety of all personnel on site. They will be backed up by the head office based senior management team and by the Health and Safety Manager on a visiting basis.

All personnel will comply with the rules and regulations laid down in the Site Rules.

All visitors to the site will be required to sign in/out and all personnel working on the site will be subject to an induction on the Safety, Quality and Environmental systems.

## 5.6 Plant and Equipment

All plant operators will be trained in the operation of their particular piece of plant and will be certified accordingly. Daily plant inspections will be carried out, with servicing and maintenance being carried out based on these findings. A record of the relevant certificates and inspections will be held on site throughout the duration of the works.

If HGVs are unable to be sheeted from the ground, then they will be required to be fitted with auto-sheeting systems to remove the possibility of falls from height.

All plant, deliveries will be pre briefed before accessing the site. Please see the Traffic Management for full details of controls in place for access & egress.

Records of test results will be held on site and will be available for inspection.

## 5.7 Traffic Management

Due to the limited quantities of imports to the site comprising rebar for the piles, pile caps, and concrete imported over short time periods during peak construction/piling activities, a comprehensive traffic management strategy is not considered to be required for this site. In addition, other than deliveries and removal off site of small volumes of materials, all works will take place within the redline boundary of the site and traffic impact to public roadways is therefore considered to be negligible. During the construction phase the following will be adhered to:

- Physical separation of construction traffic and public roadways;
- Appropriate traffic signage at the entrance to site warning of construction traffic entering and exiting site;
- Parking for vehicles of site personnel, operatives and visitors;
- Loading and unloading of plant and materials; and,
- Storage of plant and materials;

[redacted] will liaise with both the Council's Highways department and the Environment Agency site managers operating south of the Site on Trentside to notify them of incoming loads.

### Site Access

Traffic will arrive from the B1392 (Trent Side) travelling either north or south. Large loads should probably approach from the north due to the tight turn onto site. For extraordinary loads, it is recommended that a route is planned in advance, for example using Freight Journey Planner ([redacted]), using actual vehicle dimensions.

The access route will require caution regarding the following:

- Consideration should be given to the surrounding developments, which includes residential properties near the site;
- The site is located immediately north of a swing bridge; and,
- The site is located off a 30mph limit road.

Real-time route planning (e.g. via Google Maps or smart satellite navigation systems) is strongly recommended before and during all road journeys.

It is expected that all site personnel, visitors and delivery vehicles will adhere to a stipulated speed limit on approach to the site. Drivers are required to drive in a manner that minimises vehicle noise, emission and to be considerate of other road users.

All drivers and pedestrians are to know and understand the routes and traffic rules on site. Standard road signs are to be used where appropriate. Induction training is to be provided for drivers, workers and visitors and instructions sent out to visitors before their visit.

All plant and vehicles to be used on site should only be operated by suitably trained and qualified personnel (e.g. CPCS card holders).

**Parking**

There is very limited parking available on the roads directly surrounding the site. The contractor is to create a designated parking area which would allow for parking of the workforce and of plant machinery. In addition, site personnel, operatives and visitors will be encouraged to consider vehicle sharing in view of limited parking available on the site.

Parking will only be allowed in designated parking areas and vehicle drivers are to avoid blocking intersections or side roads. The site is near a residential area and priority should be given to local residents and users of neighbouring facilities.

**Loading and Unloading of Plant and Materials**

Deliveries for plant and materials will access the site via the entrance/exit off Trent Side. Deliveries must only take place within the site working hours discussed in Section 4.16. The importance of ensuring that safe traffic movement around site should be outlined to all staff and site personnel in an attempt to minimise unnecessary turning or manoeuvring at the site.

If site personnel are directing vehicle movement they must be sufficiently trained as a banks-man/signaller. The need for vehicles to reverse out of the site onto public highways should be avoided where possible as reversing is a major cause of fatal accidents. Due to the size of the site deliveries should be kept to a minimum.

However the inbound site construction materials will be of a limited quantity comprised of rebar for the piles, pile caps, and concrete. Thus there is anticipated to be a limited delivered entering site and these deliveries will occur over short time periods during peak construction/piling activities.

**Storage of Plant and Materials**

A good standard of housekeeping is required across the site, however particularly within plant and material storage areas.

Flammable materials must be stored away from other material and protected from accidental ignition. Due to the size of the site deliveries should be planned to keep materials on site to a minimum.

Storage of materials is to be kept inside locked containers for increased security. Movement of storage areas, and repurposing of land throughout the development for use as storage, is going to be likely considering the limited space available on site. Consideration should be given to the use of multi stage and/multi-storey temporary offices and stores, for maximum land use efficiency.

**Boundary Hoarding**

Adequate protective fencing must be provided around the site boundary as required throughout the works.

**Pedestrian Access**

From pre-construction enabling works through to completion, pedestrian access will be restricted to safe areas protected by proper access control measures. There will be no public access to the site and this should be enforced through adequate fencing and site security.

Separate entrances and exits should be in place for pedestrians and vehicles in order to reduce the possibility of road traffic accidents. Firm and level walkways should be in place on the site, with protective barriers ensuring pedestrians keep to the designated route. Clear crossings should be in place when a pedestrian route intersects a roadway.

**Vehicle Movements and Environmental Considerations**

North Lincolnshire Council and [redacted] support an environmentally conscious and sustainable approach. In support of this, they request that deliveries and vehicle movements are reduced. Where possible, more sustainable modes of transport should be considered.

Transport accounts for 10-20% of construction costs. Construction vehicles contribute to serious road congestion, and construction sites suffer with poor reliability of deliveries.

The Considerate Constructors Scheme (CCS) considers aspects of site transport. It rewards site managers who attempt to avoid on-street car parking, ensure routes to site are well identified and keep deliveries out of rush hours or other sensitive times. Using CCS to help manage a site may result in improved transport performance.

The Building Research Establishment (BRE) offer guidance on reducing site transport, and thus cutting costs. Financial and productivity benefits of adopting a more efficient approach to transport and logistics include:

- Reduced fuel and delivery costs;
- Increased delivery efficiency and reliability;
- Reduced costs for parking; and,
- Increased profitability.

**Public Transport**

Where reasonably practicable, all site staff, sub-contractors and visitors should be encouraged to use these public transport means.

Where possible, sub-contractors should be sourced locally to reduce driving distances and times; this also helps to promote a positive work-life balance which leads to greater productivity.
Where public transport is not viable for personnel, the use of car sharing should be strongly encouraged.

### Reducing Vehicle Emissions

As far as practicably possible, delivery vehicles and plant operating on site should be operating with low emission engines.

### Carriageway Quality

[redacted] will conduct Pre-Condition Surveys of Trentside and the Wharf Access prior to any works being conducted at the Wharf Site. Inspections will be carried out to verify any disturbance/wear to the road following the movement of each Abnormal Indivisible Load across the carriageway. The Council will be notified and operations temporarily ceased if it is verified that the road has sustained any damage. A Post Condition Survey will be carried out following the completion of operations at the Wharf, with the results submitted to the Council.

### Protective Boards/Plates

Following the results of the Pre-Condition Surveys, and in conjunction with Plan: CEMP/WATER/001 (contained at Appendix H) illustrating the water main on Trentside, [redacted] will lay steel plates in the wharf access area and over the water main area on Trentside during AIL movements to reduce the risk of disturbances to the road and identified services.

## 6 REGULATORY AUTHORITY CONSULTATION

[redacted] Project Manager will maintain contact with local representatives in the immediate area so that any concerns on environmental impacts may be addressed at an early stage.

Regular visits from the regulatory authorities will be encouraged so that they may be confident that controls are in place and monitoring is being carried out. This will aid the authorities in responding to any enquiries from the public.

## 7 DOCUMENTATION

### 7.1 Quality Systems

As an ISO9001 Accredited Contractor, all operations on the site will be undertaken in line with [redacted] Quality systems and procedures.

### 7.2 Availability of Records

[redacted] will record the activities carried out on site on a daily basis both in the Site Diary and in the DER. All documentation pertaining to the environmental monitoring will be held in the site

offices. In addition, a copy of all consents, licences, duty of care paperwork, pumping records etc. will be held on site.

A duplicate copy of all documentations will be held at [redacted]

## 7.3 Completion Report

A completion report will be prepared by [redacted] for submission to the regulatory authorities. The report will include details of the environmental monitoring procedure undertaken, air, noise and vibration quality results, daily and weekly environmental records, survey information and any other relevant information.

The report will be submitted to the Regulators within one month of completion of works on site.

# 8 LICENCES

Ordnance Survey Reproduction Licence Number. 100035365

## DRAWINGS

[redacted]

## APPENDICES

APPENDIX A Daily and Weekly Record Sheets
APPENDIX [redacted] Site Set Up and HSQE File
APPENDIX C Emergency Response Plan
APPENDIX D Traffic Management Plan
APPENDIX E Flood Risk
APPENDIX F Ecology
APPENDIX G Piling Risk Assessment
APPENDIX H Water Services Plan

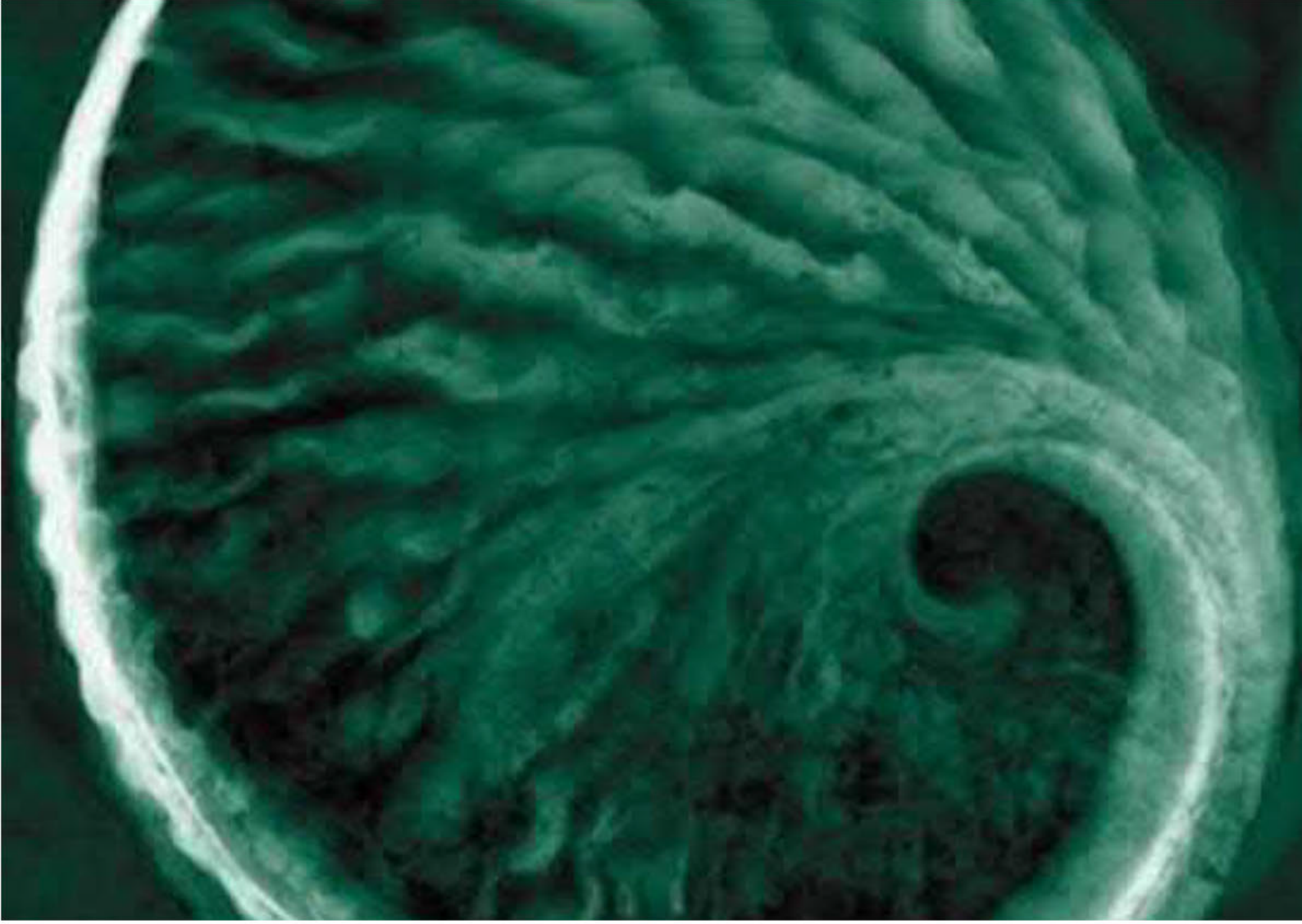
# APPENDIX A
# Daily and Weekly Record Sheets

# APPENDIX B
# [redacted]Site Set Up and HSQE File

# APPENDIX C
# Emergency Response Plan

# APPENDIX D
# Traffic Management Plan

# APPENDIX E
# Flood Risk



[redacted]

# Ecological Appraisal

## Keadby Wharf Reinforcement Works

10 September 2019

Project No.: 0521984

*The business of sustainability*

ERM

# 1. INTRODUCTION

Environmental Resources Management Ltd ("ERM") has been instructed by DWD LLP, on behalf of [redacted] to provide an appraisal of the ecological risks to accompany the planning application for the construction of wharf reinforcement works at Railway Wharf, located on the left (west) bank of the River Trent, Station Rd, Keadby, DN17 3BN.

The works (the 'Proposed Development') are required to provide suitable foundations to support cranes that will be used to offload equipment for the construction of the nearby Keadby 2 power station from vessels moored in the adjacent River Trent.

## 1.1 Site Description

The site comprises an existing river wharf and short stretch of access road, surrounded by grassed earth embankments directly adjacent to the River Trent and to the north of the Stainforth and Keadby Canal, north of Keadby, North Lincolnshire, at grid reference SE835114 (see Figure 1-1).

**Figure 1-1: Site Location Plan**


# 2. PROPOSED DEVELOPMENT

The existing construction of the quayside at Railway Wharf consists of a reinforced concrete ground-bearing slab. The quay edge itself is constructed from a steel sheet pile wall with a concrete capping beam. The sheet pile wall has some anchor/tie bars that are bolted through the face of the wall and extend back underground, presumably to a dead man anchor at some point away from the quay wall.

The Proposed Development is an upgrade to the existing wharf structure, comprising the installation of three new crane pads to support the weight of the cranes being used for equipment transfer without damage to the existing quay wall. The crane pads will have reinforced concrete pile foundations to a depth of approximately 16.5 m. Installation of the piles will require some breaking of the concrete surface on the existing wharf structure. The piles will be installed by auger methods over a period of

approximately 10 days and there will be no percussive piling. Construction work is expected to take place over a period of approximately 45 days, beginning as soon as practicable following the receipt of planning permission. The works are expected to be completed prior to the start of March 2020 (*ie* the start of the breeding bird season).

Once completed, the new crane pads will be flush with the existing level of the wharf; there will be no surface expression or change in topography adjacent to the river. All works will be entirely buried (see Figure 2-1 and Figure 2-2).

Approximately 80 deliveries are expected over a 6 month period using the upgraded wharf (*ie* approximately 12 per month).

## Figure 2-1: Plan of the proposed crane pad installation

## Figure 2-2: Cross section of the proposed crane pad instalation (inc RC Piles)

# 3. DESIGNATIONS

The tidal River Trent runs adjacent to the wharf and is high in suspended solids, which feed the sediment-rich habitats of the Humber Estuary. The estuary is a Special Area of Conservation (SAC)[1] (and also an internationally important wetland under the Ramsar Convention), primarily for the following *Annex I* habitats:

- 1130 Estuaries; and
- 1140 Mudflats and sandflats not covered by seawater at low tide.

Other *Annex I* habitats that occur as qualifying features of the SAC, but which are not the primary reason for the designation of the site are listed below.

- 1110 Sandbanks which are slightly covered by sea water all the time.
- 1150 Coastal lagoons (Priority feature).
- 1310 *Salicornia* and other annuals colonizing mud and sand.
- 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).
- 2110 Embryonic shifting dunes.
- 2120 Shifting dunes along the shoreline with *Ammophila arenaria.*
- 2130 Fixed coastal dunes with herbaceous vegetation (Priority feature).
- 2160 Dunes with *Hippopha rhamnoides.*

*Annex II* fauna that are present, but are not the primary reason for site selection are:

- 1095 Sea lamprey (*Petromyzon marinus*);
- 1099 River lamprey (*Lampetra fluviatilis*); and
- 1364 Grey seal (*Halichoerus grypus*).

The estuary is also a Site of Special Scientific Interest (SSSI)[2] for its habitats (estuary, saline lagoons, sand dunes and standing waters), its wintering and passage waterfowl, breeding bird assemblage, vascular plant assemblage, invertebrate assemblage, river and sea lamprey and grey seal.

In addition to lamprey, other fish species of conservation concern that are known to occur in the Humber Estuary and may migrate past the wharf at Keadby include the IUCN Critically Endangered eel (*Anguilla anguilla*); the *Annex II* species Allis shad (*Alosa alosa*) and Twaite shad (*Alosa fallax*); Atlantic salmon (*Salmo salar*) and European smelt (*Osmerus eperlanus*). All of these are Priority Species under the UK Post-2010 Biodiversity Framework.

The extreme eastern end of the Stainforth and Keadby Canal Corridor Local Wildlife Site (LWS) adjoins the wharf site to the south. The LWS is approximately 10 km long and supports a rich aquatic flora that throughout its length includes *Lemna minor* (common duckweed), *Lemna gibba* (fat duckweed) *Spirodela polyrhiza* (greater duckweed), *Myriophyllum spicatum* (spiked water-milfoil), *Feoniculum vulgare* (fennel) and *Potamogeton perfoliatus* (perfoliate pondweed) and the non-native *Lagarosiphon major* (curly waterweed) and *Elodea nuttallii* (Nuttall's waterweed). Other widespread water plants are *Sagittaria sagittifolia* (arrowhead), *Sparganium emersum* (unbranched bur-reed), *Nuphar lutea* (yellow water-lily), *Butomus umbellatus* (flowering-rush), *Persicaria amphibia* (amphibious bistort), *Iris pseudacorus* (yellow iris), *Lycopus europaeus* (gypsywort), *Rumex hydrolapathum* (water dock), *Glyceria maxima* (reed sweet-grass), *Phalaris arundinacea* (reed canary-grass) and *Phragmites australis* (common reed). The canal banks are mostly vertical, but

[redacted]

[2] [redacted] (accessed 4 September 2019)

gently sloping wet edges created by anglers hold a variety of further species such as *Scutellaria galericulata* (skullcap), *Stachys palustris* (marsh woundwort), *Angelica sylvestris* (angelica), *Scrophularia auriculata* (water figwort), *Oenanthe crocata* (hemlock water-dropwort), *Pulicaria dysenterica* (common fleabane), *Lysimachia vulgaris* (yellow loosestrife) and *Carex otrubae* (false fox-sedge). The canal is the largest artificial waterway in the Isle of Axeholme and is used by more barges and water craft than other waterways.

# 4. BASELINE

## 4.1 Flora

A site visit to the wharf at Keadby was made on 21st August 2019. The existing wharf was found to be in a poor state of repair. The concrete surface of the wharf had a patchy covering of mosses, with scattered *Phragmites australis* (common reed), the shrub *Buddleja davidii* (butterfly bush), the grass *Arrenatherum elatius* (false oat-grass) and the herbs *Epilobium hirsutum* (great willowherb), *Rumex* species (docks), *Senecio jacobaea* (common ragwort), *Urtica dioica* (common nettle) often in places where the concrete has cracked (see *Photograph 4.1*). Cracks on the riverside face of the wharf have been colonised largely by reeds (see *Photograph 4.2*). A single *Sorbus aucuparia* (rowan) seedling was growing through a crack in the wood.

A bank of *Phragmites australis* was present immediately to the north of the wharf, with a single *Sambucus nigra* (elder), the grass *Arrenatherum elatius* and the herbs *Epilobium hirsutum, Hieracium* species (a hawkweed) and *Urtica dioica* (see ***Error! Reference source not found.***).

Floating *Azolla filiculoides* (water fern), an invasive species, was observed on the surface of the River Trent at the mouth of the Stainforth and Keadby Canal, which occurs to the immediate south of the wharf (see *Photograph 4.4*). This species is listed on *Schedule 9* of the *Wildlife and Countryside Act 1981* (as amended) and as such it is an offence to plant, or otherwise cause this species to grow / spread in the wild.

### Photograph 4.1 Existing Wharf Surface

## Photograph 4.2 Vegetation on Wharf Face

## Photograph 1.3 Bank of Reeds North of Wharf

**Photograph 4.4 *Azolla filiculoides* (Water Fern) on River Trent at Canal Mouth**


## 4.2 Fauna

A single kingfisher (*Alcedo atthis*) was observed flying from reeds adjacent to the wharf (see *Photograph 4.5*) during the site visit. Kingfisher is listed on *Schedule 1* of the *Wildlife and Countryside Act, 1981* (as amended), on *Annex I* of the *Wild Birds Directive (2009/147/EC)*, and is part of the breeding bird assemblage of the Humber Estuary SSSI.

No activity, or signs of otter, were recorded during the site visit. However, a thorough search of the vegetation adjacent to the northern end of the wharf was not possible.

## Photograph 4.5 Location of Kingfisher Sighting

# 5. ECOLOGY ASSESSMENT OVERVIEW

The works will not involve any in-river work, or affect directly any of the fringing vegetation adjacent to the wharf. There will be no direct effects on the designations of the Humber Estuary. The plant species observed on the wharf during the site visit were all common species typical of such disturbed areas.

It is likely that some birds use the vegetation such as the banks of reeds adjoining the northern edge of the wharf throughout the year. A kingfisher (listed on the breeding bird assemblage of the Humber Estuary SSSI) was observed flying from an area of reeds during the site visit in late August. However, the works will take place over the winter months and hence will avoid the breeding bird season (March to July inclusive for kingfisher). Significant effects on breeding kingfishers are, therefore, not predicted.

No evidence of otter was observed, but as the vegetation bordering the wharf could not be accessed during the site visit, a check survey is recommended to confirm that there are no couches / holts. Free passage for otters moving along the river will be maintained.

The works will not involve percussive piling and no significant propagation of noise into the water column is expected. Significant secondary effects on fish and other aquatic fauna species, including changes to their populations / distribution are, therefore, not predicted. In addition, the main areas for qualifying interest fauna species of the Humber Estuary SAC are away from the River Trent. River and sea lamprey spawning in the Humber Estuary are restricted largely to the Ouse catchment (Rivers Ouse, Swale, Ure and Wharfe) and grey seal activity in the Humber Estuary is concentrated on the Lincolnshire coast at Donna Nook.

It is possible that some temporary disturbance effects to resident / wintering bird species could result from activities on the wharf, including through visual disturbance and due to noise and vibration from the construction workforce and their activities. However, any disturbance is likely to be of short duration only, and significant effects are not predicted. It is likely also that any fauna species around the wharf are used to levels of disturbance from regular human activity already, including works at the Keadby Power Station, boat activity on the river and through the canal, and farming activities on adjacent arable land. Only intermittent boat movements to and from the wharf are expected once the Proposed Development is operational.

Whilst the works will not involve any in-river construction work in the River Trent, or the Stainforth and Keadby Canal, boat movements to and from the wharf as part of the operation of the Proposed Development could carry the invasive species *Azolla filiculoides* [redacted] ill implement measures to avoid this species being spread by boats using the river during constr [redacted] on and operation [redacted] would also be open to discussing with the Environment Agency (EA) potential measures to remove it from the water at Canal Mouth to help avoid its spread in the river.

Standard site construction practices and control measures will be implemented, to avoid significant quantities of sediment, concrete, or other materials from the construction works entering the River Trent.

Given the assessment above, adverse effects on the Humber Estuary SAC/Ramsar and / or significant effects on the Humber Estuary SSSI and / or the Stainforth and Keadby Canal Corridor LWS are not predicted.

# APPENDIX G
# Piling Risk Assessment







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