

VikingLink

nationalgrid

UK Onshore Scheme

Outline Construction Environmental Management Plan – Proposed Converter Station

VKL-08-39-G500-013

August 2017



Co-financed by the European Union
Connecting Europe Facility

Contents

1	INTRODUCTION	1
1.1	Introduction	1
1.2	Objective of the CEMP	1
1.3	Structure of the CEMP.....	1
2	PROJECT DESCRIPTION	3
2.1	The UK Onshore Scheme.....	3
2.2	Construction Details	5
3	ROLES AND RESPONSIBILITIES	8
3.1	Overview	8
3.2	Key Roles.....	8
4	COMMUNICATIONS, REPORTING AND TRAINING	11
4.1	Communication	11
4.2	Inductions and Training	12
4.3	Environmental Monitoring and Reporting	12
5	GENERAL ENVIRONMENTAL REQUIREMENTS	14
5.1	Introduction	14
5.2	Construction Programming Constraints.....	14
5.3	Site Management and Housekeeping	14
5.4	Staff Facilities.....	15
5.5	Site Security	15
5.6	Bio-security Measures	15
6	SPECIFIC ENVIRONMENTAL REQUIREMENTS	16
6.1	Introduction	16
6.2	Geology & Hydrogeology.....	16
6.3	Water Resources & Hydrology.....	19
6.4	Agriculture & Soils	21
6.5	Ecology	23
6.6	Landscape & Visual Amenity	29
6.7	Archaeology & Cultural Heritage.....	31
6.8	Socio-economics & Tourism	32
6.9	Traffic & Transport.....	33
6.10	Noise & Vibration.....	34

List of Tables

Table 1.1 Structure of this Document	1
Table 2.1 Proposed Converter Station – Key Components	3
Table 2.2 Proposed Converter Station – Indicative Construction Programme.....	7
Table 6.1 Mitigation Requirements (Geology & Hydrogeology)	16
Table 6.2 Mitigation Requirements (Water Resources & Hydrology)	19
Table 6.3 Mitigation Requirements (Agriculture & Soils)	21
Table 6.4 Mitigation Requirements (Ecology)	23
Table 6.5 Mitigation Requirements (Landscape & Visual Amenity).....	29
Table 6.6 Mitigation Requirements (Archaeology & Cultural Heritage)	31
Table 6.7 Mitigation Requirements (Socio-economics & Tourism).....	32
Table 6.8 Mitigation Requirements (Traffic & Transport)	33
Table 6.9 Mitigation Requirements (Noise & Vibration)	34

Glossary & Abbreviations

Glossary of Terms	
Term	Meaning
Alternating Current (AC)	Electric power transmission in which the voltage varies in a sinusoidal fashion. This is the most common form of electricity transmission and distribution.
base scheme design	The design of the UK Onshore Scheme for the purposes of the planning application.
connection point	This is the point on the GB electricity transmission system (Bicker Fen 400 kV Substation) where Viking Link connects to the network.
the Contractor	Party or parties responsible for the detailed design and construction UK Onshore Scheme.
converter station	Facility containing specialist equipment (some indoors and some potentially outdoors) for the purposes of converting electricity from AC to DC or DC to AC.
converter station site	The proposed site occupying approx. 30 ha containing the converter station and associated landscaping, drainage as well as land required for construction.
converter station zone	The proposed zone occupying approx. 8 ha containing the converter station buildings, outdoor electrical equipment and hardstandings within a security fence.
detailed scheme design	The design of the Scheme developed by the Contractor within the Limits of Deviation (AC and DC cables) and Rochdale Envelope (converter station).
Direct Current (DC)	Electric power transmission in which the voltage is continuous. This is most commonly used for long distance point to point transmission.
Limits of Deviation	These define the maximum extents of the corridor for which planning permission is sought and within which proposed DC and AC cable routes may be installed.
Open cut methods	Cable installation methods which require the excavation of a trench into which ducts or cables can be directly laid.
the Project	Viking Link, from the connection point at Revsing Substation in Denmark to the connection Bicker Fen Substation in Great Britain).
Rochdale Envelope	This defines the parameters of the proposed converter station for which planning permission is sought including its location, layout and dimensions.
the Scheme	UK Onshore Scheme from MLWS to the connection point comprising underground AC and DC cables, converter station and access road.
Temporary Construction Compound	Compound used by the Contractor for siting of offices, welfare facilities, storage and laydown.
Temporary Construction Facilities	All areas used for temporary construction requirements including compounds, working areas.

Glossary of Terms

Term	Meaning
Temporary Works Area	Larger working area located on or adjacent to the working width used where construction activities requires a larger area for example at trenchless crossings.
Transition Joint Pit	Buried concrete pit where onshore and submarine cables are physically jointed together.
trenchless methods	Cable installation methods used to cross obstacles such as roads or watercourses and ensure less disturbance at the ground surface.
working width	The 50 m wide working corridor required for the installation of underground AC cables.

List of Abbreviations

Abbreviation	Meaning
AC	Alternating Current
AIL	Abnormal Indivisible Load
AIS	Air Insulated Switchgear
AOD	Above Ordnance Datum
BBC	Boston Borough Council
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CSC	Line-commutated current source conversion
DC	Direct Current
DNO	Distribution Network Operator
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
ES	Environmental Statement
GB	Great Britain
GIS	Gas Insulated Switchgear
ha	hectare
HGV	Heavy Goods Vehicle
HVDC	High Voltage Direct Current
IDB	Internal Drainage Board
km	kilometre
km ²	square kilometre
kV	kilovolt

List of Abbreviations

Abbreviation	Meaning
LoD	Limits of Deviation
LPA	Local Planning Authority
LV	Light vehicles
m	metre
mAOD	metres Above Ordnance Datum
mm	millimetre
NETS	National Electricity Transmission System
NGVL	National Grid Viking Link Limited
NOx	Nitrogen Oxides
PM	Particulate Matter
SOx	Sulphur Oxides
SHDC	South Holland District Council
TCPA	Town and Country Planning Act
UK	United Kingdom
VSC	Self-commutated voltage source conversion
XLPE	Cross-linked polyethylene

Note

The purpose of this Plan is to set out how the mitigation commitments described within the Environmental Statement will be delivered during construction. The exact roles and responsibilities described in the Plan are subject to the appointment of a Contractor and may change. The Plan will be finalised by the Contractor prior to the commencement of construction taking into account a detailed scheme design and more precise information about construction methods and phasing.

1 Introduction

1.1 Introduction

1.1.1 This outline Construction Environmental Management Plan (CEMP) has been prepared for the proposed converter station (including the permanent access road and the proposed Alternating Current (AC) cable route). This CEMP establishes a framework within which the Contractor will plan, implement and deliver environmental management, mitigation and monitoring requirements during the construction. It is the practical means by which the mitigation commitments made in the Environmental Statement (ES) will be implemented.

1.1.2 Some sections of the CEMP have been left blank where they relate to details which will not be known until a Contractor is appointed. It is intended that the CEMP will be finalised by the Contractor prior to the start of construction based on a detailed scheme design and details of construction activities and programme.

1.2 Objective of the CEMP

1.2.1 The aims of the Project EMP are to:

- Provide a mechanism for ensuring that measures to mitigate potentially adverse environmental impacts are implemented.
- Ensure that environmental good practices are adopted throughout the construction of the proposed converter station.
- Ensure a prompt response if any unacceptable adverse impacts are identified, with the provision of appropriate additional mitigation measures as required.
- Provide a means for mitigating impacts that may not be anticipated or become apparent until construction is underway.
- Provide assurance to consultees and other stakeholders that requirements with respect to environmental mitigation are being addressed.
- Provide a mechanism for compliance auditing to ensure mitigation measures are being effectively implemented and maintained through construction.

1.3 Structure of the CEMP

1.3.1 An overview of the content of this document is provided in Table 1.1.

Table 1.1 Structure of this Document		
Section	Title	Description of Content
1	Introduction	Provides background information about this document and its

Table 1.1 Structure of this Document		
Section	Title	Description of Content
		content.
2	Project Description	Provides details of the proposed converter station, permanent access road and proposed AC cable route including a description of construction methods and facilities.
3	Roles and Responsibilities	Sets out the roles and responsibilities of the parties involved in construction.
4	Communications, Reporting and Training	Sets out the requirements for regular communications and reporting as well as staff training.
5	General Environmental Management Requirements	Sets out the general requirements with respect to environmental management during construction.
6	Specific Environmental Requirements	Sets out the environmental requirements identified within the Register of Mitigation in the ES.

2 Project Description

2.1 The UK Onshore Scheme

Overview

- 2.1.1 Viking Link (also referred to as ‘the Project’) is a proposed 1400 megawatt (MW) high voltage DC electricity link or interconnector between the British and Danish electricity transmission networks. The Project will enable Great Britain and Denmark to trade energy as a commodity within the European Energy Market. This will strengthen Great Britain’s and Denmark’s economies, improve the security of their electricity supplies and reduce wholesale electricity prices providing British and Danish consumers with access to more affordable low carbon energy. It comprises approximately 762 kilometres (km) of DC onshore and submarine electricity transmission cables between new converter stations which are in turn connected to the high voltage electricity transmission networks at existing substations at Revsing, Jutland in Denmark and at Bicker Fen, Lincolnshire in Great Britain.
- 2.1.2 The sub-sections below relate to the proposed converter station, permanent access road and the proposed AC cable route as applicable to this CEMP. Details of the DC cable route between the proposed landfall site and the proposed converter station site are provided within the DC cable route CEMP.

Proposed Converter Station

- 2.1.3 The proposed converter station will be located at North Ing Drove in South Holland. It comprises a range of specialist electrical equipment some of which must be located within buildings as well as some which can be located outdoors. A description of the main components of the converter station is provided in Table 2.1. The final layout and specification of the components to be included within the converter station are subject to detailed design.

Table 2.1 Proposed Converter Station – Key Components	
Component	Details
DC switch hall	This contains the termination of the DC onshore underground cables together with HVDC switchgear (specialist DC electrical equipment) to connect these to the power electronics. This equipment can be enclosed in a building up to 24 m high or located outdoors.
Valve halls and AC reactor (ancillary equipment)	This contains high voltage power electronics equipment that converts electricity from DC to AC and vice-versa. This is located indoors in buildings up to 24 m high. It also contains specialist equipment to control the environmental conditions within the building.

Table 2.1 Proposed Converter Station – Key Components

Component	Details
Control building	This contains control panels and associated operator stations for operating the converter station as well as protection and communication equipment. Offices, welfare facilities and other auxiliary systems are also located within the control building.
Cooling fans	This comprises external fin-fan units located outside of the Valve Halls. The fans are used to cool down the valves. Power electronic valves are water cooled. Coolant is pumped through the fin-fan units. Note that not all of the fans are operational all of the time.
Transformers	These are normally located outdoors and change the AC voltage electricity between the voltage needed for transmission via the AC transmission system (the National Electricity Transmission System (NETS)) and the voltage needed to connect to the power electronic equipment for conversion from AC to DC within the Valve Halls. The transformers are separated by firewalls.
AC switchyard	This connects the proposed converter station to the NETS. It includes a range of electrical equipment which is located outdoors including harmonic filtration and reactive power compensation equipment, circuit breakers, transformers, busbars and insulators.
Diesel backup Generator	This will be used in the event of a failure of the low voltage electricity supply provided by the Distribution Network Operator (DNO).
Spare parts building	This building houses spare parts and components. Adjacent hardstanding areas provide storage for a spare transformer and spare cable drums.

Proposed AC Cable Route

- 2.1.4 The proposed AC cable route connects Viking Link to the NETS at the existing Bicker Fen 400 kV Substation. The proposed AC cable route is approximately 2.34 km in length and is routed through agricultural land. The proposed AC route follows as direct a route as possible taking in to consideration for environmental and engineering constraints between the proposed converter station and the Bicker Fen 400 kV Substation. It is contained within a 150 m wide corridor which form Limits of Deviation (LoD) and provide some flexibility to avoid any unforeseen constraints during construction. The route will consist of six high voltage AC cables as well as three fibre optic cables, which will be split between two trenches that will be approximately 1.5 m deep and 1.5 m wide.

The Permanent Access Road

- 2.1.5 Access to the proposed converter station will be provided by a new 2.8 km long access road from the existing public highway network (A52). This includes a new junction with the A52, a new bridge crossing of the Hammond Beck, culvert crossings of other drains and a new junction with

North Ing Drove. The access road will be up to 6 m wide enabling two-way traffic flows and designed to accommodate Heavy Goods Vehicles (HGVs) and Abnormal Indivisible Loads (AILs).

2.2 Construction Details

Proposed Converter Station Site Arrangements

2.2.1 The exact layout will depend on the Contractor appointed to design and construct the proposed converter station, however, the sections below provide an indicative outline of the site arrangements. The eastern part of the site, referred to as a temporary construction area, will accommodate temporary construction facilities whilst the construction of the proposed converter station will occur in the western part of the site. This will include a temporary construction compound occupying up to 1.5 ha (0.015 km²). It includes provision for:

- Site offices including offices and meeting rooms.
- Staff welfare facilities including portable chemical toilets, kitchen and mess room.
- Storage areas for construction vehicles, plant, equipment and other materials.
- Appropriately bunded areas to be used for the storage of oils and other fuels.
- Wheel washing facilities to be used by construction vehicles and plant.
- Segregated waste management storage areas.
- Car parking for construction staff and site visitors.
- Rock crushing and concrete batching facilities.

2.2.2 The permanent access road will be constructed first and as such will require an additional temporary construction compound to be established. This additional temporary construction compound will be located close to the junction with the A52. It will be used for providing temporary facilities and storage during construction of the permanent access road. Following completion of the road the compound will be demobilised but the hardstanding left in-situ for the duration of construction of the proposed converter station so that it can be used for overflow and storage. It will be fully reinstated following completion of construction.

Proposed Converter Station Construction Activities

2.2.3 Construction of the proposed converter station will comprise a number of activities including those summarised below.

- Preliminary works: This will include further site investigation and preconstruction surveys required to be undertaken in advance of construction.
- Access road construction: This will include construction of the permanent access road from the A52 to the proposed site including the crossing of the Hammond Beck.
- Site establishment: This includes vegetation clearance, soil removal and establishment of all temporary facilities including site offices, lay down and storage areas and welfare

facilities, development of electricity and water supplies and erection of security fencing or hoarding.

- Earthworks: This will include land re-profiling in order to establish a level platform comprised of crushed rock on which the proposed converter station will be constructed.
- Civil engineering works: This will include construction of building foundations, foundations for outdoor electrical equipment development of the site's permanent drainage system and construction of internal roads and car parking arrangements.
- Building works: This will include the construction of all building units including erection of steel frames and cladding.
- Cable installation: This will include the installation of underground DC cables entering the converter station as well as underground AC cables between the converter station and Bicker Fen Substation.
- Provision/installation of permanent services: This will include water supplies, foul drainage, low voltage electricity supply and telecommunications.
- Mechanical and electrical works: This will include installation of high voltage AC and DC electrical equipment and transformers.
- Commissioning: Following completion of all construction works there will be a period of commissioning and testing.
- Site Reinstatement & Landscape Works: This will include removal of site offices and temporary facilities, land reinstatement and landscape works.

Installation of the Proposed AC Cable

- 2.2.4 The proposed AC cable route is defined by a 150 m wide corridor within which the 50 m working width required for AC cable installation will be established. The working width will comprise:
- Two trenches within which AC and fibre cables will be laid.
 - Temporary access road to allow movement of construction traffic along the AC route.
 - Areas for temporary storage and management of excavated top and sub soils.
 - Areas for temporary drainage and water management.

Working Hours

- 2.2.5 Construction activities will in general be undertaken during daytime periods. There will be some periods during which out of hours working and/or 24 hour working will be required such as delivery of abnormal loads, during concrete pouring activities or works within buildings once they have been erected. Any period or activity requiring out of hours working that may be disruptive to the local community will be discussed with the relevant local planning authority in advance of the works.

Construction Programme

2.2.6 Construction of the proposed converter station is planned to be undertaken over a period of 24 to 36 months from approximately 2019 to 2022. Note this will be replaced by a detailed programme following appointment of a Contractor.

Table 2.2 Proposed Converter Station – Indicative Construction Programme

Activity	2019			2020				2021				2022			
	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Preparatory works including access road construction and site establishment	█	█	█												
Civil construction works including earthworks , foundations and erection of buildings			█	█	█	█	█								
Mechanical and electrical works including installation of AC and DC cables							█	█	█	█	█	█			
Testing, commissioning and site reinstatement including landscape planting.												█	█	█	

3 Roles and Responsibilities

3.1 Overview

3.1.1 This section of the CEMP will set out the key roles and responsibilities of parties involved in the construction of the Scheme including providing contact details for key members of staff.

3.2 Key Roles

3.2.1 The exact roles and responsibilities will be confirmed prior to construction but as a minimum the Contractor will have identified members of staff responsible for environmental management. The following section provides an indication of the roles which are envisaged.

Site Manager

3.2.2 The Site Manager is responsible for:

- Coordinating the delivery of the proposed converter station, permanent access road and proposed AC cable route including ensuring conformance with the CEMP and other management plans, as well as any incident investigation required.

Site Engineer

3.2.3 The Site Engineer, working with the Site Manager is responsible for:

- Reviewing risk assessments and method statements (RAMS) submitted by the Contractor prior to beginning new works activities.
- Reviewing of the Safety, Health and Environment (SHE) Plan, prepared and amended by the SHE Advisor.
- Reviewing and monitoring the implementation of, and accuracy of, the CEMP.
- Conducting incident investigation in the event of an incident or near miss being reported by any worker or member of site management staff during site walkovers or inspections.
- Monitoring of Contractor compliance with plans and procedures.
- Liaising with the emergency services.
- Conducting regular site inspections.
- Reviewing applications for environmental consents and permits in line with the Site Manager.

Environmental Clerk of Works

- 3.2.4 An Environmental or Ecological Clerk of Works (ECoW) will be appointed for the duration of the construction. The purpose of this appointment is to ensure that the environmental interests of areas that may be affected by the works are safeguarded. The ECoW will have the appropriate authority to review RAMS, oversee works and recommend action as appropriate, including temporarily stopping works if required, for example to safeguard protected species and their habitats, or where any other breaches of environmental legislation are likely to occur.
- 3.2.5 The ECoW will ensure the implementation of, and compliance with, the provisions of the CEMP and the mitigation contained within the ES as well as licensing or other conditions imposed on the construction.
- 3.2.6 The ECoW may be a company who provide a general Clerk of Works who can liaise with a team of internal specialists on specific environmental subjects, for example, ecology, noise, air quality, or pollution where required throughout construction, or a suitably qualified individual.
- 3.2.7 In summary, the ECoW is responsible for:
- Inspections of the Contractor's work site, on a daily basis.
 - Weekly routine audits of the Contractor's compliance with the CEMP – site activities and record keeping.
 - Monitoring or inspection of site activities in response to incidents, breaches of the CEMP or complaints received from a third party.
 - Inspections of works to ensure that environmental mitigation measures incorporated into the design have been implemented.
 - Implementation of corrective mitigation measures where proposed mitigation results in effects over and above those within any ES, licenses or planning conditions.

Safety, Health & Environment Advisor

- 3.2.8 The SHE Advisor is responsible for:
- Providing site inductions and toolbox talks on safety, health and environmental matters and sensitivities to the appropriate staff prior to works being undertaken.
 - Preparing, reviewing and updating the SHE Plan.
 - Assisting the Site Manager and Site Engineer in reviewing and approving RAMS.
 - Undertaking regular site inspections/ walkovers to ensure construction practice is compliant with best working practices and approved RAMS. The SHE Advisor will have the authority to stop work where non-compliant working is observed.
 - Reporting any health and/ or safety incidents to Site Management as per the defined reporting procedure within the SHE Plan and the CEMP.
 - Providing health and safety advice to construction managers.
 - Attending all construction progress meetings and providing updates on safety, health and environment performance of construction works.

The Land Officer

3.2.9 The Land Officer is responsible for:

- Discussing/agreeing all conditions relating to access, including fencing, gates, access to severed land, stock relocation, reinstatement, drainage, security and the complaints handling procedure with local land owners.
- Being the first point of contact for any individuals, or agents of people, with interest in land and for all land related matters.
- Dealing with all matters relating to compensation claims or losses from those with land interests arising as a result of the proposed converter station, permanent access road and proposed AC cable route.
- Attending all construction progress meetings.

3.2.10 This role may be supported by an Agricultural Liaison Officer (or similar), employed by the Contractor to provide local landowners and those with land-related interests information regarding daily construction activities. The Agricultural Liaison Officer will assist on activities listed above, as well as providing the Land Officer information regarding the Contractors use of appropriate access points and relaying information on any inadvertent damage to fences, gates, drains, trees or buildings from construction activities.

4 Communications, Reporting and Training

4.1 Communication

Communication of the CEMP

- 4.1.1 To ensure that all parties involved in the construction are aware of the environmental mitigation requirements, controls and reporting requirements as agreed within this CEMP, this document will be circulated to:
- The Client (NGVL).
 - The Contractor.
 - ECoW.
 - All sub-contractors.
 - Local Planning Authorities.
 - Statutory and non-statutory consultees as required.
- 4.1.2 This document will be maintained within the SHE management system and a copy kept within the site office.
- 4.1.3 Weekly SHE meetings will be held, which the ECoW will attend. These meetings will be minuted and distributed to all relevant parties for reference.

Public Communications and Liaison

- 4.1.4 The Contractor will provide details (postal and email address) of the named contacts to which all written complaints should be addressed, and will also be responsible for the implementation of an appropriate system for logging and recording any complaints received. This will be made available to the ECoW and the relevant consultees. Any complaints received will be acknowledged within 24 hours during all hours when works, including deliveries, are taking place.
- 4.1.5 The Contractor shall ensure that all complaints receive a written response, including details of any action undertaken (if such action is deemed appropriate). The Contractor shall provide NGVL with a monthly report that details all complaints, who they were filed by and the actions taken.
- 4.1.6 Where required, in addition to ensuring that the public is fully informed of the proposed programme of works (including working hours), the Contractor will ensure that procedures are established for notifying the public in advance of planned works. It should also be noted that the agreed period of advanced notification will similarly apply to any alterations in the construction

programme or working hours that have been agreed with the Contractor and the relevant departments of the Local Planning Authority (LPA).

4.2 Inductions and Training

Inductions

- 4.2.1 The Contractor will ensure all employees, sub-contractors, suppliers, and other visitors to the site undertake site specific induction training. The induction will include a summary of environmental risks associated with the proposed converter station, permanent access road and proposed AC cable route, specifically those relevant to the inductee. Topics that will be addressed will include any areas of environmental sensitivity, such as ecological, archaeological, hydrological or geological sensitive areas, in addition to pollution prevention and protection of the water environment, ground stability and waste management.

Training in Environmental Requirements

- 4.2.2 The Contractor will ensure all personnel are suitably trained on general site good practice emergency procedures including the use of spill kits, silt mitigation and concrete washing out for example. To ensure all staff are suitably trained on such procedures, training will be provided by a suitably qualified person on a regular basis. Details of the proposed training will be provided to the NGVL prior to commencement of construction works.
- 4.2.3 Toolbox talks will be provided by the ECoW (or other relevant specialist such as archaeological clerk of works) throughout construction of the proposed converter station, permanent access road and proposed AC cable route to provide on-going reinforcement and awareness training of environmental sensitivities and issues on site. Prior to works starting on site the programme of talks to be undertaken will be agreed by the appointed Contractor. Additional toolbox talks may be required outside of this based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc. A record of all toolbox talks and attendees will be maintained within the SHE management system.

4.3 Environmental Monitoring and Reporting

Environmental Incidents and Near Miss Reporting

- 4.3.1 All incidents and near misses will be reported as soon as they occur. The Emergency Response Plan (ERP) will be prepared by the appointed Contractor detailing the response to be taken in the event of an incident or near miss, detailing the individuals to be informed and the reporting process. The ERP will also include the appropriate measures that should be undertaken to prevent, reduce, contain, clean and prevent further incidents from occurring as necessary.

- 4.3.2 A register of all environmental incidents and near misses will be maintained to detail the time, date and nature of incident as well as any corrective actions taken, correspondence with regulators and lessons learnt.

Environmental Management Reporting

- 4.3.3 Regular monitoring, auditing and reporting of the environmental management of the site will be undertaken for the duration of construction of the proposed converter station, permanent access road and the proposed AC cable route. The reporting requirements during construction of have been established to ensure effective implementation of mitigation measures and provide a framework for ongoing monitoring of environmental performance during construction.

Pre-construction audit

- 4.3.4 Prior to construction a pre-construction audit will be undertaken by the ECoW to ensure that any specific requirements of this CEMP and relevant legislation, licenses and consents have been met. This audit will determine the adequacy of the system set up for management, mitigation and monitoring measures related to waste, pollution and the environment.

Daily Site Checks

- 4.3.5 Daily site checks will be carried out of the construction compounds and other working areas as required, including the permanent access road and proposed AC cable route working width. Checks will be undertaken by the Site Environmental Manager/ECoW, or other suitably qualified staff. Any actions resulting from these checks will be reported at weekly progress meetings.

Weekly Site Inspections

- 4.3.6 A weekly site inspection will be carried out by the Site Environmental Manager/ECoW to identify any breaches and/or environmental incidents and identify suitable corrective measures.

Monthly Site Audits

- 4.3.7 Monthly environmental audits will be undertaken by the Site Environmental Manager or designated auditor. The audit will evaluate compliance with environmental legislation, requirements of the CEMP, best practice and any other NGVL- or scheme-specific requirements. A report will be written for each audit documenting the findings and any corrective measures suggested to be implemented.

5 General Environmental Requirements

5.1 Introduction

5.1.1 This section provides a description of the general environmental management measures to be implemented during the construction of the proposed converter station, permanent access road and proposed AC cable route.

5.2 Construction Programming Constraints

5.2.1 Where necessary, the removal of habitat with the potential to support nesting birds, including hedgerows and trees, will be conducted outside of the bird breeding season (March – August). Where this is not possible a pre-construction nest search will be conducted by the ECoW, with appropriate mitigation advised, where necessary, to ensure compliance with the Wildlife and Countryside Act 1981 (as amended).

5.3 Site Management and Housekeeping

5.3.1 The layout of temporary construction facilities will be finalised by the Contractor. Infrastructure inherent with site construction compounds such as access points, roads, lighting, location of generators and welfare facilities for example will be located so as to minimise impacts of dust, noise and lighting for example on both the environment and local sensitive receptors such as residential dwellings.

5.3.2 The construction compound and areas for the storage of all materials, including paints, sealants or other chemicals, will be located at least 25 m away from surface water bodies (where possible) in a secure container within impermeable areas within the temporary site construction compound. All construction materials will be stored in accordance with the appropriate regulatory requirements, including the Control of Substances Hazardous to Health Regulations 1994.

5.3.3 The temporary site compound(s) and laydown areas will require daily inspection and maintenance including appropriate storage of materials, litter picks and general housekeeping to ensure health and safety risks as well as environmental considerations are appropriately managed.

5.3.4 Wheel wash facilities will be provided at the exits from the construction compound and work site where appropriate, including, where reasonably practicable, mechanical wheel spinners, adequate provision for drainage via settlement tanks and regular maintenance of settlement tanks, or other appropriate facility, during the specified working hours.

5.4 Staff Facilities

5.4.1 Appropriate welfare facilities will be provided. These will be located at an appropriate distance from sensitive receptors such as watercourses or residential properties. Prior to construction, the Contractor will prepare the arrangements for welfare provision and will be responsible for the maintenance of the facilities throughout the construction phase of the proposed converter station, permanent access road and proposed AC cable route. Facilities will include:

- Toilets.
- Washing Facilities.
- Drinking Water.
- Changing Rooms & Lockers.
- Mess rooms.

5.5 Site Security

5.5.1 Appropriate security fencing will be established around the construction site including compounds, works areas and areas used for the storage of plant and machinery, hazardous substances. Appropriate fencing will be erected along the length of the proposed AC cable route and permanent access road. The condition and effectiveness of these boundaries will be subject to daily inspection.

5.5.2 Where determined necessary by the Contractor Closed Circuit Television (CCTV) will be installed within construction areas.

5.5.3 Access to working areas will be restricted to approved personnel only, with security on site to monitor and manage traffic and site visitors.

5.5.4 Lighting of Temporary Construction Compounds (TCCs) and Temporary Working Areas (TWAs) will be implemented for the safety of staff. Lighting will be directional and will be designed to prevent light pollution as much as possible.

5.6 Bio-security Measures

5.6.1 The Contractor will ensure that appropriate bio-security measures including those required for dealing with invasive species are provided. This includes preparation of a Bio-security Method Statement and briefing of all staff in the form of Toolbox Talks or similar.

6 Specific Environmental Requirements

6.1 Introduction

6.1.1 The following sections set out the mitigation identified within the Environmental Statement. Prior to the start of construction these measures will be reviewed and as appropriate additional detail will be provided on their implementation.

6.2 Geology & Hydrogeology

Table 6.1 Mitigation Requirements (Geology & Hydrogeology)	
Reference	Description of Mitigation Measure
GEO01	All oil containing equipment will be located within bunding to provide containment in the event of leaks or spillages.
GEO02	The permanent drainage system will incorporate oil-water interceptors to intercept potentially contaminated runoff prior to release.
GEO03	In the event that ethylene glycol is to be used as a coolant control measures will be incorporated into pipework design to prevent leaks such as the use of pipe collars and double integrity pipes.
GEO04	All chemical and hazardous substances will be stored in accordance with Environment Agency (EA) Pollution Prevention Guidance (withdrawn but widely considered good practice) and applicable storage regulations.
GEO05	Further ground investigation will be undertaken to inform detailed design and inform final adopted foundation solutions, the cut/fill extents, dewatering strategies, the extent to which excavation support is required and also the extent to which ground gas mitigation is required.
GEO06	Materials used in buildings and infrastructure would be specified taking due account of the ground conditions such as elevated sulphate or ground gases.
GEO07	The assessment methodology set out in BRE Special Digest 1 (2005) will be used to determine the appropriate concrete classification.
GEO08	The initial assessment of ground gas suggests that some low level ground gas mitigation may be required, e.g. gas impermeable membrane, as part of construction. As per GEO05 this should be re-evaluated prior to construction based on further ground investigation.
GEO09	Construction Environmental Management Plan (CEMP) will be developed that will contain measures to ensure compliance with relevant standards and legislation.

Table 6.1 Mitigation Requirements (Geology & Hydrogeology)

Reference	Description of Mitigation Measure
GEO10	Prior to construction, a strategy will be prepared, 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 within the development, and what materials are surplus and require either disposal or onward management to ensure appropriate re-use. The strategy will also define whether any geotechnical improvement may be required, prior to re-use or disposal.
GEO11	To minimise the effects on soil resources during any earthworks, including materials management following foundation construction, 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.
GEO12	The re-use of excavated materials during construction will be governed by either a Materials Management Plan developed in accordance with the CL:AIRE Code of Practice, an environmental permit or a relevant exemption
GEO13	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 cannot, as an alternative, be put to use either on site or on other sites.
GEO14	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 EA'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.
GEO15	Due to shallow groundwater it is expected that groundwater controls will need to be adopted during construction. The water quality testing undertaken as part of the 2016 ground investigation suggests that pre-treatment due to chemical contamination of the groundwater is unlikely to be required prior to disposal.
GEO16	Where the volume of groundwater requiring dewatering exceeds twenty cubic metres a day then an abstraction permit will be obtained from the EA. Consents will also be obtained where discharging to watercourses including Internal Drainage Board (IDB) managed water courses or public sewer.
GEO17	The adopted dewatering techniques will be appropriate to the type of excavation and hydrogeological conditions. The hydraulic conductivity of the ground within each excavation or trench section will be considered to establish the required abstraction volume to achieve the necessary drawdown of groundwater levels. The type of dewatering undertaken may include the use of cut off walls, sump dewatering and potentially well point dewatering with some provision for attenuation capacity to allow for water treatment and/or settlement prior to final discharge.

Table 6.1 Mitigation Requirements (Geology & Hydrogeology)

Reference	Description of Mitigation Measure
GEO18	Measures contained within the CEMP would 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.
GEO19	The CEMP will set out how material is to be excavated and stockpiled to minimise the potential for run-off, soil degradation or wind dispersal of dusts.
GEO20	The covering of long-term stockpiles with sheeting or the binding of the surface through temporary grass seeding will be specified together with dampening procedures during dry weather.
GEO21	In the event of uncontrolled releases occurring, the CEMP and the Contractor's own method statements contained in their Construction Phase Plan (CPP) would also set out the measures required to ensure that the extent and impact of any such releases are contained and ultimately remediated.
GEO22	An Emergency Spill Response Plan (ESRP) 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.
GEO23	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 50 m away from surface water features/drains, 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.
GEO24	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 hard standing areas when not in use and, where necessary, to make use of drip trays beneath oil tanks/engines/gearboxes/hydraulics.
GEO25	Spill response kits containing equipment that is appropriate to the types and quantities of materials being used and stored during construction will be maintained on site for the duration of the works.
GEO26	Potential impacts specific to construction workers during site preparation and construction would be mitigated by the following measures and through working in accordance with CIRIA C692 3rd Edition 'Environmental Good Practice On Site' (2010).

6.3 Water Resources & Hydrology

Table 6.2 Mitigation Requirements (Water Resources & Hydrology)	
Reference	Description of Mitigation Measure
WAT01	A surface water management plan will be prepared by the appointed Contractor outlining the measures to be implemented to ensure the existing run-off rates to the surrounding water environment are maintained at pre development rates at the proposed converter station site.
WAT02	The detailed design of the surface water management strategy will be based on a series of infiltration/soakaway tests carried prior to construction out on proposed converter station zone and the worst case attenuation volumes outlined in the Flood Risk Assessment (FRA) (totalling 9,404 m ³). Tests will be undertaken prior to construction and in accordance with the BRE Digest 365 Guidelines. All drainage works will be approved by the Lead Local Flood Authority (LLFA) prior to the commencement of construction.
WAT03	The proposed converter station will developed on a level profiled to approximately 2.9 m Above Ordinance Datum (mAOD) and the permanent access road developed on a level profiled to approximately 2.7 mAOD, locating the proposed converter station and permanent access road above the 'worst-case' 1 in 1,000 year breach plus climate change established by South Holland District Council (SHDC) Strategic Flood Risk Assessment (SFRA) flood event.
WAT04	Where watercourses and drains will be crossed by the permanent access road and proposed AC cable route, an appropriately sized culvert pipe will be installed in the watercourse to accommodate the water volumes and flows. Alternatively temporary bridging may be installed. Any temporary access roads will be removed at the end of the construction programme. The construction works will be undertaken in accordance with a methodology for the crossing of watercourses agreed with the EA, LLFA and IDB. This will include measures to ensure that watercourses, including their banks, are reinstated to their previous condition where possible.
WAT05	The permanent access road bridge over Hammond Beck will be constructed with a soffit equal to or greater than existing bridge levels with designs produced in consultation with Black Sluice IDB.
WAT06	Detailed design of the permanent access road will, where practicable, incorporate engineering techniques to enable flood water conveyance beneath the permanent access road to ensure existing flood storage capacity is maintained.
WAT07	The detailed design and construction of the proposed converter station, permanent access road and proposed AC cable route will follow Defra/EA Flood Risk Assessment Guidance for New Development, Phase 2 to ensure no greater or altered flood risk extents are caused as a result of construction or permanent footprint.

Table 6.2 Mitigation Requirements (Water Resources & Hydrology)	
Reference	Description of Mitigation Measure
WAT08	Temporary drainage mitigation techniques including, but not limited to, run-off interceptor channels will be installed prior to the construction of the formal drainage scheme to ensure that discharges are controlled in quality and volume. This may include the use of settling tanks and/or ponds to remove sediment, temporary interceptors and hydraulic brakes.
WAT09	Construction material and/or spoil within Temporary Construction Compound (TCC) will be positioned away from drainage systems or surface watercourses/field drainage and no hazardous substances will be stored within close proximity of the drainage network.
WAT10	EA guidance will be followed during construction for: discharging to surface water and groundwater, oil storage, pollution prevention (various Pollution Prevention Guidance (PPG) Notes 6 (Working at Construction Sites), 5 (Working in, near or liable to affect watercourses)). CIRIA guidance (C741 environmental good practice and C648 control of water pollution) will be followed to prevent pollution incidents.
WAT11	Procedures and construction practices will be developed to comply with the conditions of the EA and the LLFA, with all staff briefed on the importance of water quality, the location of watercourses and pollution prevention at site induction prior to undertaking works.
WAT12	Wheel washers and dust suppression measures will be implemented as appropriate to prevent the migration of pollutants, as well as regular cleaning of roads of any construction waste and dirt to be carried out (as per the CIRIA Sustainable Drainage System (SuDS) Manual).
WAT13	Refuelling of machinery will be undertaken within designated areas where spillages can be easily contained. Machinery will be routinely checked to ensure it is in good working condition.
WAT14	Any tanks and associated pipe work containing substances included in List 1 of the Groundwater Directive will be double skinned and be provided with intermediate leak detection equipment.
WAT15	Areas with prevalent run-off will be identified prior to earthworks and the drainage actively managed through these areas, e.g. through bunding and/or temporary drainage.
WAT16	Areas at risk of spillage of a potential pollutant, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will be bunded and carefully sited to minimise the risk of polluting the drainage system or local watercourses. Additionally the bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage. The bunds used to store fuel, oil etc. will have a 110% capacity of the volume of fuel, oil etc. to be stored to ensure no overspill to the surrounding environment.

Table 6.2 Mitigation Requirements (Water Resources & Hydrology)

Reference	Description of Mitigation Measure
WAT17	Where work is required to be undertaken adjacent to watercourses, the area disturbed close to the watercourses will be reduced to the minimum necessary for the work.
WAT18	Excavated material to be placed away from the banks of watercourses to avoid spillage into the watercourses. Similarly construction materials will be managed and all plant and machinery maintained in good condition to minimise the risk posed to the aquatic environment.
WAT19	The EA will be consulted throughout the construction period to promote best practice and to implement proposed mitigation measures.
WAT20	The permanent access road and the converter station will be signed up to the EA's flood warning system (https://www.gov.uk/sign-up-for-flood-warnings) which will give site personnel the opportunity to move to a safe area during an extreme event. A flood evacuation plan will be developed for the construction and operational phases of the permanent access road, with staff training provided, to ensure in the event that the plan is activated all staff are aware of the procedures upon receipt of the flooding warning, together with evacuation routes.
WAT21	An Operational Management Plan (OMP) will be developed and will incorporate measures to prevent pollution and increased flood risk, to include emergency spill response procedures, clean up and remediation of contaminated water run-off.

6.4 Agriculture & Soils

Table 6.3 Mitigation Requirements (Agriculture & Soils)

Reference	Description of Mitigation Measure
AGR01	During detailed design, the alignment of the permanent access road and proposed AC cable route will be along field margins as far as practicably possible to avoid severance of agricultural land.
AGR02	As a minimum there will be at least 0.9 m minimum depth of cover is achieved over the cables trenches and excavations.
AGR03	Prior to construction a Soil Handling and Storage Protocol (SHSP) will be prepared detailing the good practice measures that will be incorporated to construction methods. These measures will include, but not be limited to: <ul style="list-style-type: none"> · Limiting the number of machine movements within the working width to minimise compaction and damage to soil structure. · Avoiding or limiting construction after periods of heavy rainfall or during periods when soils are waterlogged to minimise compaction and damage to soil structure.

Table 6.3 Mitigation Requirements (Agriculture & Soils)

Reference	Description of Mitigation Measure
AGR03 (cont.)	<ul style="list-style-type: none"> · the establishment of vegetative cover, as soon as possible after construction is complete to maintain soil structure and prevent soil loss through erosion. For arable land, areas of bare soil should be seeded with grass or a green manure crop. For pasture land, areas of bare soil should be seeded with grass crop. This will be informed through ongoing discussion between National Grid Viking Link Ltd (NGVL) and landowners/tenant farmers; · Seeding of temporary soil storage mounds to reduce run off and erosion. · Retain physical disaggregation, through the separate handling and storage of top- and sub-soils. Soil removed (excavated) in order of horizons and stored in separate stockpiles based on soil type, near to its original location so it can be replaced/reinstated in a similar location. Soil profile is reinstated. · The avoidance of soil compaction through the use of Low Ground Pressure (LGP) tracked or wheeled tyres to spread the weight of vehicles, limiting the height of soil stockpile mounds, restricting construction traffic to specific areas on the construction working width and tilling the area afterwards using recognised practices and equipment to remove any compaction. · Seeding of soil stockpiles if soil resources are stored for longer than six months to prevent irreversible damage to soil resource quality through factors such as erosion, and enable effective and quick restoration.
AGR04	<p>The SHSP will also set out good practice measures to minimise the potential transfer of disease, pathogens, and weeds (biosecurity), as per appropriate guidance (such as Defra’s Construction Code of Practice for the Sustainable Use of Soils on Construction Sites). These measures may include, but not be limited to:</p> <ul style="list-style-type: none"> · Avoiding soil movement from one farm to another via heavy plant movement as far as is practicable in normal working operations, with additional tailored mitigation such as disinfectant spraying being employed should specific pathogens or diseases be identified (e.g. Foot and Mouth).
AGR04 (cont.)	<ul style="list-style-type: none"> · Continued management of the displaced soil (soil storage mounds) with suitable herbicide application should control the weed seed burden in both the top- and sub-soil so as to avoid the increased growth of weeds (e.g. black grass, thistles, ragwort) following soil replacement. Although none of the land within the Zone of Influence (ZoI) has been identified as being organically managed, the use of herbicide will be tailored if required.
AGR05	<p>Where possible, the period in which excavated soil are temporarily stored will be reduced. For example, the construction of the proposed AC cable route will be undertaken in a phased manor.</p>

Table 6.3 Mitigation Requirements (Agriculture & Soils)

Reference	Description of Mitigation Measure
AGR06	<p>Site specific (bespoke) mitigation measures will be implemented where required. These measures may include:</p> <ul style="list-style-type: none"> · changes to the grazing regime to accommodate the loss in working areas; · construction of designated crossing points to minimise disruption to the movement of livestock and machinery; · programming works to avoid specific locations (for example lambing sheds) during sensitive times in the farming calendar (for example lambing). <p>The identification of these measures is the subject of ongoing discussion with the NGVL and Agricultural Land Officers (ALOs); once identified these measures will be incorporated into project documentation (such as the detailed CEMP, site specific method statements or similar).</p>

6.5 Ecology

Table 6.4 Mitigation Requirements (Ecology)

Reference	Description of Mitigation Measure
ECO01	<p>A range of measures to ensure legal compliance will be implemented for the duration of the construction phase, which will be delivered through the implementation of the CEMP. The measures relating to ecological features are:</p> <ul style="list-style-type: none"> · Pre-construction surveys will be carried out to ensure baseline data remains up to date. · An appropriately qualified Ecological Clerk of Works (EcCOW) will be appointed. The role of the EcCOW will be set out in the CEMP and the appointed person(s) will be a member of the Chartered Institute of Ecology and Environmental Management or hold equivalent accreditation. · There will be a demarcation of the working areas (including storage areas and accesses), using appropriate fencing, to protect retained habitats and features. · Traps or wildlife exclusion fencing will be installed (and maintained), as required by protected species licences.
ECO01 (cont.)	<ul style="list-style-type: none"> · Clearance of trees, hedges, grassland and other habitats will take place under supervision and at the appropriate time of year, as appropriate to the site/species in question. · There will be prompt reinstatement of habitats, <i>in-situ</i>, to their former condition, including any measures to enhance species diversity.

Table 6.4 Mitigation Requirements (Ecology)	
Reference	Description of Mitigation Measure
ECO02	<p>The CEMP will also include:</p> <ul style="list-style-type: none"> Procedures for designated sites affected by construction activities. General Method Statements for habitat protection. Species-specific Method Statements, addressing protected and priority species. Provisions for tree protection and methods of felling (including pruning, pollarding, replacement tree and hedgerow planting, and use of protective fencing and root protection zones) in accordance with BS5837:2012. Measures of post-construction monitoring relating to reinstatement and mitigation activity including triggers and details of remedial action.
ECO03	<p>Pollution Prevention</p> <ul style="list-style-type: none"> Bunds to catch and divert runoff, drip trays to prevent any oil and fuel spillages spreading and the avoidance of storage of any materials in close proximity to the surrounding drainage network. Windblown dust will be minimised by using wheel washing and damping down, while net fencing will catch windblown rubbish. To address the risk of singular accidental events, mitigation measures include provision of spill kits and emergency response procedures. Pollution prevention measures will also include minimising air pollution from plant emissions, including turning engines off when not in use. These measures will be effective upon commencement of construction.
ECO04	<p>Tree Protection</p> <ul style="list-style-type: none"> Measures to protect trees throughout construction will be identified within an Arboricultural Method Statement and will accord to current standards (BS5837:2012 Trees in relation to design, demolition and construction – Recommendations). All tree and hedgerow works will comply with BS3998:2010 ‘Tree Work – Recommendations’. To restrict spread of tree pathogens, all equipment and machinery and vehicles used for tree, hedge and shrub removal will be cleaned, disinfected and used in accordance with current Forestry Commission biosecurity guidance and the EcCOW will advise on whether each working area requires ‘red’ or ‘amber’ level biosecurity precautions.
ECO05	<p>Reptiles</p> <p>Reasonable Avoidance Measures (RAMs) will be required for all site clearance works to ensure no killing or injury to individuals.</p>

Table 6.4 Mitigation Requirements (Ecology)

Reference	Description of Mitigation Measure
ECO06	<p>Vegetation will be removed in a staged approach:</p> <ul style="list-style-type: none"> Initial strimming of vegetation to 300 mm followed by a later second cut to 150 mm and with both cuts proceeding in one direction will allow reptiles (as well as amphibians and small mammals) to vacate the affected area. The areas will be left for a period of 24 hours (hrs) after the first and second cuts, after each of which the EcCOW will undertake a hand search to confirm the absence of reptiles (and other fauna). Following the second cut and hand search, vegetation will be strimmed to ground level, at which point full site clearance and levelling will then be undertaken.
ECO07	Any animals found during hand searching will be removed to alternative suitable habitat by the EcCOW.
ECO08	Site clearance affecting suitable reptile hibernation features (identified by the EcCOW) will avoid the hibernation period (November to early March inclusive).
ECO09	Smaller excavations within working areas will be covered overnight to prevent entrapment of any individuals. If any open excavations are left uncovered these will be inspected by the EcCOW at the start of each working day to ensure no individuals are present, and to remove any that are trapped to a safe location.
ECO10	In order to prevent reptiles using subsoil and topsoil piles for refuge or hibernation, the surfaces of the piles will be tamped down and consolidated to prevent access. In addition, stored materials which could be used for refuge or hibernation by reptiles will be stored off the ground on pallets to prevent their access.
ECO11	<p>Great Crested Newts (GCN)</p> <p>Construction elements associated with the ditches and tall ruderal habitat bounding the Bicker Fen Substation which provide high quality GCN habitat (adjacent to Pond 175 and Ditch 611), will be carried out under a Natural England (NE) licence to ensure no detrimental impact on the local GCN population. Construction elements associated with terrestrial habitat likely to be used by GCN within 500 m of Pond 175 and Ditch 611 will also be subject to NE licensing.</p>
ECO12	Works are subject to NE licensing but are likely to be undertaken during the breeding season (mid-April to June inclusive) when GCN are likely to be in waterbodies. These works would be undertaken using RAMs and the EcCOW will confirm the absence of amphibians prior to site clearance. Any animals found prior to works commencing will be removed to alternative suitable habitat by the EcCOW. Site clearance during the GCN hibernation period (November to early March inclusive) will be avoided in areas of suitable habitat to prevent disturbing animals.

Table 6.4 Mitigation Requirements (Ecology)	
Reference	Description of Mitigation Measure
ECO13	The strategy for retaining, enhancing or replacing GCN habitat will rely on onsite mitigation measures. Waterbodies with confirmed GCN presence may require exclusion fencing and potentially pitfall trapping around their perimeter within a 250 m buffer.
ECO14	Where GCN exclusion is necessary, works will be implemented under NE licence. Temporary upright and one-way newt fencing of standard design will be installed where required in addition to pitfall traps and/or additional refugia (e.g. carpet tiles) against perimeter fences as appropriate to the objectives of the exclusion. The installation of the fencing will be supervised by a licensed ecologist and will be installed and removed during the months February to October inclusive, provided weather and ground conditions are suitable. On completion of installation of the AC cable route, exclusion fencing and refugia will be removed by or under the supervision of a licensed ecologist. If construction works are completed during the winter, the exclusion fencing will be retained in place until the next appropriate seasonal window.
ECO15	Prior to the beginning of construction works a tool box talk will be provided by a licensed ecologist detailing the conditions of the licence. The toolbox talk will include advice on distinguishing GCNs from other amphibians and identification guides will be provided on site for reference.
ECO16	A site representative will be trained to inspect the fencing for damage. Inspections will occur daily during the construction period in times of amphibian activity (February to October inclusive) and at least fortnightly during winter periods (November to January inclusive). All minor damage to perimeter exclusion fences will be replaced on the same day that the damage is discovered by the site representative. Any substantial damage, requiring disturbance of the fence membrane at ground level (i.e. any works such as removal, reinstatement or replacement of fence membrane) shall be reported to the licensed ecologist on the morning of discovery. Ideally, remedial measures will be implemented on the same day, or at least within 24 hrs of the damage occurring, supervised as appropriate by a licensed ecologist. A record of fence checks and repairs will be kept on site with a copy of the Natural England licence. A copy of the GCN licence will be retained on site.
ECO17	Where ditches were identified as having 'good' or 'excellent' habitat for amphibians and are being crossed by the proposed AC cable route, these waterbodies will be carefully drained down and a licenced ecologist will attend site to search for any amphibians and translocate them into the same waterbody outside of the Limit of Deviation (LoD).
ECO18	Reinstatement of habitats should ensure that functionality and connectivity within the wider landscape is maintained. The existing pond and ditches within the substation should be cleared out and enhanced to maintain the existing GCN population and provide improved habitat for breeding. Hibernacula can be installed within the substation to provide additional refuge habitats.

Table 6.4 Mitigation Requirements (Ecology)

Reference	Description of Mitigation Measure
ECO19	<p>Bats</p> <p>Prior to site clearance, pre-construction surveys (tree climbing inspections and if necessary nocturnal surveys at the appropriate time of year) of all trees requiring works and identified to have moderate or high bat roost potential will be undertaken. This will be carried out in advance of each phase of the works. NE licences will be secured where roosts are identified in trees that require felling.</p>
ECO20	<p>Where necessary, lighting of construction areas will be directed away from trees, hedgerows, woodland and watercourses. Lights will be installed at an appropriate height, with directional hoods fitted to minimise spillage.</p>
ECO21	<p>Water Vole & Otter</p> <p>A pre-commencement water vole and otter survey will be carried out at all watercourses/drains to be crossed. No construction activity will commence until all mitigation and licensing requirements, where necessary, are implemented.</p>
ECO22	<p>Where no water vole burrows are identified during the pre-commencement survey, vegetation control will be undertaken to dissuade water voles from colonising the working area prior to commencement. Vegetation within the ditch and on both banks will be strimmed to bare ground, at least to the top of the bank, and where tall vegetation extends beyond this point, up to 5 m from the top of the bank. Within the ditch, strimming will extend 5 m up and downstream from the working area. Arisings will be removed from the cleared area and stored more than 5 m from the top of the ditch banks.</p>
ECO23	<p>Any excavations adjacent to watercourses that cannot be boarded or fenced overnight will have ramps installed to allow any otter that may travel through the area to escape, should they become entrapped.</p>
ECO24	<p>Vegetation clearance within the LoD prior to construction will be undertaken in line with methods described for reptile and GCN legal compliance (above) will dissuade water vole from colonising the area. Fencing to prevent GCN encroaching into the working area (under a NE EPS Licence) will also prevent water vole entering this area. The need for a Class Licence to undertake this work for water voles will be confirmed with NE.</p>
ECO25	<p>Badger</p> <p>All construction works within 30 m of a known active badger sett will be carried out under a NE licence, and will comply with the working methods and requirements as detailed in the license. Acceptable working distances from setts will be assessed on a case-by-case basis and will depend on the type and duration of activities.</p>
ECO26	<p>Should a main sett be permanently or temporarily lost as a result of development an artificial sett will be constructed six months prior to the start of works to close the existing sett.</p>

Table 6.4 Mitigation Requirements (Ecology)	
Reference	Description of Mitigation Measure
ECO27	Two-way badger gates will be installed within demarcation fencing along the proposed AC cable route and permanent access route where well used badger paths are severed in order to prevent fragmentation of the badger clan's home range.
ECO28	Trenches or excavations near badger setts will not be left open overnight and will either be boarded or fenced off at the end of each day or egress ramps will be provided.
ECO29	Excavated soil will be stored in an area agreed with the EcCOW and will not obstruct existing badger paths or interfere with any active setts.
ECO30	Pre-construction surveys will be undertaken to determine the presence of any setts that may have been constructed and any changes in extent or level of use during the interim period since surveys were completed. If site conditions change and avoidance is not possible the NE licence will be updated to include these changes with appropriate mitigation applied.
ECO31	Breeding Birds Any tree and scrub vegetation removal, or tall ruderal vegetation removal or any works affecting marginal vegetation of watercourses will be undertaken outside the bird nesting season (March to August inclusive).
ECO32	Where this is not possible, all areas to be affected will be checked for evidence of nesting birds a maximum of 24 hrs prior to works taking place. If any active bird nests are discovered these will be given a minimum standoff of 5 m (depending on species/proposed works and location) where no potentially disturbing works will take place until the young have fledged/nest vacated. A second nesting bird check will then be undertaken to ensure the tree/vegetation does not contain any further active nests prior to felling/removal works taking place.
ECO33	Retained trees and scrub adjacent to working areas will be protected from encroaching traffic using fencing (BS5837:2012).
ECO34	Any works affecting previously undisturbed areas of open fields (including any storage of materials, clearance of vegetation, or groundworks) carried out during the breeding bird season (March to August inclusive) will require a nesting bird check immediately prior to works. If active bird nests are located, the nest will be marked and all potentially disturbing works within at least 20 m of the nest location will be stopped until the nest has been vacated. Prior to works in the area commencing a further nesting bird survey will be required to establish that no active bird nests were present within the area.
ECO35	An ecologist will check any sections of bare ground of more than 0.5 ha for active bird nests if these areas have been left undisturbed (more than 50 m from an active working area) for more than 1 week during the breeding season. If nesting birds are found, measures appropriate to the species, location and proposed works will be implemented as advised by the ecologist to ensure nests are not destroyed or disturbed while active.

Table 6.4 Mitigation Requirements (Ecology)	
Reference	Description of Mitigation Measure
ECO36	These measures will be effective upon commencement of construction.
ECO37	Brown Hare RAMS will be produced and implemented during site clearance works to ensure no killing or injury to brown hare individuals.
ECO38	A walkover of the construction areas by a suitably qualified ecologist, prior to initial site clearance, will enable leverets (young/ adolescent hares) to be located and flushed out of the area. Any adult hares within the site will also disperse due to the presence of human activity.
ECO39	The fencing of site compounds will also prevent hares from becoming trapped or entangled in construction materials.
ECO40	Excavations will be boarded over at night or ramps/mammal ladders used to allow egress from excavations should individuals become trapped.
ECO41	As soon as practicably possible, the majority of habitats disturbed during construction will be reinstated in-situ to their former condition: <ul style="list-style-type: none"> Grassland replacement would generally match the use of land prior to construction. Appropriate seed mixes will be determined in consultation with the landowners to seek to replicate current conditions. Replacement hedgerow planting will follow the existing landscape pattern. Hedgerow planting would include at least five locally appropriate native species. Livestock fencing would be provided to safeguard planted specimens. Where open-cut crossings of watercourses/drains are undertaken, they will be backfilled and the natural channel form reinstated. As only a short section of watercourses/ditches will be affected, it is intended that the banks will be allowed to re-colonise naturally, in agreement with stakeholders. If bank and soil stabilisation is required, this will be provided by the use of geotextile or coir matting.
ECO42	Management will be provided over a 5 year period to ensure reinstatement planting takes place and habitats establish as intended. This assumes hedgerow planting has reached a height of 1.5 m, understorey shrub planting 4-6 m and native tree planting 7-10 m (depending on maintenance).

6.6 Landscape & Visual Amenity

Table 6.5 Mitigation Requirements (Landscape & Visual Amenity)	
Reference	Description of Mitigation Measure

Table 6.5 Mitigation Requirements (Landscape & Visual Amenity)

Reference	Description of Mitigation Measure
LV01	The detailed design of the proposed converter station will be carried out in accordance with the Design Code (Document Reference VKL-08-39-G500-012 Design Code), which sets the limits and parameters of the converter station as detailed to minimise the visual impact of the structure.
LV02	<p>The Design Code includes aspects including architectural form, orientation, façade design and materials and colours, such as:</p> <ul style="list-style-type: none"> · The enclosed buildings will have simple monolithic forms, avoiding unnecessary complexity, to ensure a clean and unbroken silhouette. · The enclosed buildings will be clad in appropriate material and colours designed to respond to those found in the surrounding context to help integrate the buildings into the landscape and views. · The location and orientation of the proposed converter station zone will be designed to respond to the existing geometric landscape pattern of drains and roads. · Lighting will be direction controlled and designed to minimise light spillage and/or glare.
LV03	Woodland and woodland edge planting around the perimeter of the proposed converter station site. This landscape zone will be 30 to 40 m in depth and will consist of a mix of predominantly native species.
LV04	Landform embankments will be incorporated into the landscape zone to further enhance the screening effect of proposed planting.
LV05	Proposed planting will be undertaken in advance of the operation of the proposed converter station, where possible, to help ensure mitigation measures begin to take effect as early as possible during the operation of the converter station.
LV06	During construction, the detailed CEMP will identify a number of measures and restrictions on the working areas in order to avoid, reduce or offset environmental effects of the construction works, including those related to the landscape and visual resource.
LV07	<p>All vegetation disturbed during construction of the proposed AC cable route and the permanent access road will be reinstated where possible to its previous land use. This includes arable land, hedgerows and road verges.</p> <p>Re-seeding will be with a suitable grass or wildflower seed mix.</p>

6.7 Archaeology & Cultural Heritage

Table 6.6 Mitigation Requirements (Archaeology & Cultural Heritage)	
Reference	Description of Mitigation Measure
ARCH01	Landscaping and screening around the proposed converter station site will screen the proposed converter station to limit impact to the setting of both designated (3 km) and non-designated receptors (1 km) within the respective zone of influence of the site.
ARCH02	Detailed design of the permanent access road and proposed AC cable route will ensure that no important relationships between designated heritage receptors will be severed.
ARCH03	All construction activities will be undertaken in accordance with UK heritage policy as defined in the National Planning Policy Framework (NPPF), and current national guidance for the assessment of the significance of heritage receptors as provided by Historic England (HE) - Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment.
ARCH04	<p>The potential impact to heritage receptors will be reduced through good working practices on site, such as:</p> <ul style="list-style-type: none"> · Keeping the working width of the proposed AC cable route to a minimum in all areas and ensuring that all construction areas are kept tidy and in good order. · Screening of key views and the placement of spoil bunds to obscure construction activity where possible (although this may be restricted by the volume of spoil available). · Control of routes for traffic travelling to and from the proposed converter station site. <p>These measures will be included within the CEMP.</p>
ARCH05	The detailed mitigation strategy for archaeology and cultural heritage, impacted by the proposed converter station, is outlined in the Mitigation Strategy (ES-4-C.07, Chapter 23, Appendix 23.5).
ARCH06	<p>A structured approach will be taken to construction mitigation measures for the proposed converter station site, proposed AC cable route and permanent access road. This approach will comprise three levels of mitigation:</p> <ul style="list-style-type: none"> · Archaeological Watching Brief · Strip, Map and Sample · Detailed Archaeological Excavation. <p>All records produced during this mitigation will be used to produce a series of reports and site archives which will be deposited with the appropriate local repository, in consultation with the archaeological advisor to the LPA. Following the completion of the reports the finding of the archaeological mitigation will be disseminated to the public in an appropriate manner.</p>

Table 6.6 Mitigation Requirements (Archaeology & Cultural Heritage)	
Reference	Description of Mitigation Measure
ARCH07	The level of mitigation applied to each of the project components (proposed converter station, permanent access road and proposed AC cable route) will be suitable to the receptors that are anticipated to be present and the impact from construction activity that is anticipated.
ARCH08	<p>The presence of Roman activity (20) and associated roddons and field boundaries (367, 369) will require the northern area of the proposed converter station to be subject to open area excavation.</p> <p>At the southwest of the proposed converter station site, where fewer receptors have been identified, in the location of a possible Roman cropmark (21) and potential for further Roman and Post-medieval activity, a programme of strip, map and sample will be undertaken.</p> <p>Due to the presence of the aforementioned Roman receptors within the proposed converter station site and general archaeological potential of the area, any other area that requires a top and or sub soil strip during construction will be subject to an archaeological watching brief.</p>
ARCH09	<p>The proposed AC cable route passes through an area of enclosures, field boundaries and trackways (370). This area will be subject to open area excavation.</p> <p>The remaining area of the proposed AC cable route will be subject to a watching brief due to the known presence of previously recorded flood defence ditches (392) at the northern end of the proposed AC cable route and potential for previously unrecorded archaeological remains dating to the Roman and Post-medieval periods.</p>
ARCH10	<p>The undesignated receptor of a demolished 19th century unnamed farm (18) will be impacted by the permanent access road. This will be mitigated through strip map and sample in the known location of the farm.</p> <p>The remaining area of the permanent access road will be subject to a watching brief due to the known presence of a previously recorded boundary ditch and pit (4), the two areas of cropmark activity (457, 458), and the potential for previously unrecorded archaeological remains dating to the Roman and Post-medieval periods.</p>

6.8 Socio-economics & Tourism

Table 6.7 Mitigation Requirements (Socio-economics & Tourism)	
Reference	Description of Mitigation Measure
SOC01	The CEMP prepared and adopted by the appointed Contractor will detail the measures adopted to minimise impacts on the amenity of local residents. This will include measures to minimise visual impact, noise, dust and construction traffic.

Table 6.7 Mitigation Requirements (Socio-economics & Tourism)

Reference	Description of Mitigation Measure
SOC02	<p>Access to Public Rights of Way (PRoW) may be disrupted during construction. Where this is the case, NGVL will work to ensure that disruption is minimised, and appropriate signage is used to clearly identify any temporary diversions that may be necessary and/or temporary closures that may be required.</p> <p>An Outline Access Management Strategy summarising this information will be submitted with the planning application.</p>

6.9 Traffic & Transport

Table 6.8 Mitigation Requirements (Traffic & Transport)

Reference	Description of Mitigation Measure
TRA01	A new permanent access road will be designed and constructed for Heavy Goods Vehicles (HGVs) and Abnormal Indivisible Loads (AILs) to facilitate construction of the proposed converter station and proposed AC cable route to avoid the use of local and minor roads.
TRA02	Highway improvements will be made to the A52 to facilitate construction of the converter station and reduce impacts to the local road network whilst construction is being undertaken. These include a right turn ghost island and acceleration lanes.
TRA03	So far as practicable material will be retained on site including the retention of all soils and spoils, therefore minimising the need to move material on and off the site.
TRA04	<p>A Construction Traffic Management Plan (CTMP) will be prepared and implemented by the appointed Contractor. This will include all mitigation identified in the ES related to the movement of construction traffic associated with the Project, including but not limited to:</p> <ul style="list-style-type: none"> • Site locations and the entry/exit arrangements. • Traffic routeing plans – defining the routes to be taken by HGVs to the site. Included within these plans will be the prioritisation of the use of A and B-roads as far as practicably possible, avoidance of Langrick Bridge and avoidance of other sensitive locations. • Construction hours and delivery times. • Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions, timing restrictions and where access is prohibited. • Measures to protect the public highway (e.g. wheel wash facilities). • Measures for the monitoring of the CTMP to ensure compliance from drivers and appropriate actions in the event of non-compliance.

Table 6.8 Mitigation Requirements (Traffic & Transport)	
Reference	Description of Mitigation Measure
TRA04 (cont.)	<ul style="list-style-type: none"> • Mechanism for responding to traffic management issues arising during the works (including concerns raised from the public) including a joint consultation approach with relevant highways authorities. • Details of traffic management requirements. • Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions (statutory limits: width, height, axle loading and gross weight), timing restrictions (if applicable) and where access is prohibited.
TRA05	<p>Other control measures implemented to limit the impact of HGV construction traffic on the local road network during construction include:</p> <ul style="list-style-type: none"> • All construction traffic to adhere to the Traffic Route Plans included in the CTMP. • All vehicles will be able to access and egress the site in a forward gear, with sufficient room off the public highway to allow them to wait without blocking the main carriageway; • Welfare facilities will be provided so as to minimise the need for off-site trips by staff during the working day. • At all site accesses, suitable supervision will be provided as required to ensure that traffic is controlled at access points during construction (for example banksman checking road traffic and controlling construction vehicle movements) and mud deposits on the roads are minimised. Specifically, at the access to the public highway at the A52 banksmen will be utilised to manage the movement of HGVs on and off the public highway. Appropriate warning signage will also be provided at approaches and access junction. • Where required, traffic signals (in accordance with New Roads and Street Works Act (NRSWA), or stop-go boards will be used to control road traffic. Road signs will conform to Chapter 8 (Traffic Signs Manual) and NRSWA.
TRA06	<p>A Travel Plan will be introduced in order to encourage sustainable travel to the proposed converter station site. The Travel Plan would include measures such as; encouragement of car sharing and public transport usage, better marketing of information and implementation of a Travel Plan Co-ordinator.</p> <p>Where appropriate, a shuttle bus to transport workers to key interchange locations could be introduced.</p>

6.10 Noise & Vibration

Table 6.9 Mitigation Requirements (Noise & Vibration)	
Reference	Description of Mitigation Measure

Table 6.9 Mitigation Requirements (Noise & Vibration)	
Reference	Description of Mitigation Measure
NOI01	The equipment specification for detailed design incentivises the minimisation of any noise of tonal or impulsive character (as described under BS 4142:2014) emitted from the converter station; these being acoustic characteristics which may increase the intrusiveness of any sound emitted. This design specification is set to ensure the Local Planning Authority (LPA) criterion is not exceeded.
NOI02	Construction will be undertaken in accordance with a CEMP which will include mitigation measures with respect to reducing the impact of construction related noise and vibration.
NOI03	<p>The utilisation of Best Practicable Means (BPM) as far as reasonably practicable. BPM will include, but not be limited to:</p> <ul style="list-style-type: none"> • The use of quieter alternative methods, plant and/or equipment; • The use of site hoardings, enclosures, acoustic barriers, portable screens and/or screening nosier items of plant; • Maintaining and operating all vehicles, plant and equipment in an appropriate manner, to ensure that extraneous sound from mechanical vibration, creaking and squeaking is kept to a minimum; • Siting all ancillary plant such as generators, compressors and pumps so as to cause minimum noise disturbance; • Machines in intermittent use will be shut down during periods of inactivity or throttled down to a minimum; and • using designated routes for construction related traffic.
NOI04	<p>To minimise adverse vibration as far as is reasonably practicable, the following mitigation measures will be considered.</p> <ul style="list-style-type: none"> • Low vibration working methods will be employed. Plant will be carefully selected to minimise the potential for vibration. • Vibration will be controlled at source and the spread of vibration will be limited. • Where processes could potentially give rise to significant levels of vibration, on-site vibration levels will be monitored regularly by a suitably qualified person appointed specifically for the purpose. • Plant and/or methods of working likely to cause significant levels of vibration at sensitive receptors will be replaced by other less intrusive plant and/or methods of working.
NOI05	A written scheme for noise management measures will be agreed with the LPAs prior to the start of construction and incorporated into the CEMP.

CONTACT US



You can find out more information by:



calling our freephone number:
0800 731 0561



Sending an email to:
vikinglink@communityrelations.co.uk



Writing to our freepost address at:
FREEPOST VIKING LINK



Visiting our website at:
www.viking-link.com

If you, or someone you know, would like information in Braille, audio, large print or another language, please call us on the freephone number above.