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The Great Grid Upgrade

Norwich to Tilbury

Design Development Report

April 2024

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Abbreviations

AC	Alternating Current
AONB	Area of Outstanding Natural Beauty
CDM	Construction (Design and Management) Regulations (CDM)
CPRSS	Corridor Preliminary Routeing and Siting Study
CRoW	Countryside and Right of Way Act
CSE	Cable Sealing End
CWS	County Wildlife Site
DCO	Development Consent Order
DNO	Distribution Network Operators
EACN	East Anglia Connection Node
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic fields
ESO	Electricity System Operator
EWP	Energy White Paper
FES	Future Energy Scenarios
GIL	Gas Insulated Line
GW	Gigawatt
HDD	Horizontal Directional Drilling
HVDC	High Voltage Direct Current
kV	Kilovolt
km	Kilometre
LTC	Lower Thames Crossing
LWS	Local Wildlife Site
MEWP	Mobile Elevated Working Platform
MITS	Main Interconnected Transmission System
NEA	North East Anglia
NETS	National Electricity Transmission System
NETS SQSS	National Electricity Transmission System Security and Quality of Supply Standard
NGC	National Grid Company
NGET	National Grid Electricity Transmission
NOA	Network Options Assessment
NPS	National Policy Statement

NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OCSS	Offshore Co-ordination Support Scheme
OFFSET	Offshore Electricity Grid Task Force
OTNR	Offshore Transmission Network Review
OHL	Overhead Lines
PRoW	Public Right of Way
SAC	Special Area of Conservation
SEA	South East Anglia
SOBR	Strategic Options Backcheck and Review
SQSS	Security and Quality of Supply Standard
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WHS	World Heritage Site
μT	Microteslas

Executive summary

National Grid Electricity Transmission plc (NGET) referred to as National Grid in this report is developing proposals to reinforce the high voltage power network in East Anglia. It is National Grid that is developing plans for Norwich to Tilbury (the 'Project'). The Project would support the UK's net zero target through the connection in East Anglia of new low carbon energy generation, and by reinforcing the transmission network.

In spring 2022, a non-statutory public consultation was held for a period of eight weeks, between April 2022 and June 2022. This consultation introduced the Project, explained how National Grid had developed its proposals, and sought the views of the public and stakeholders.

In summer 2023, an additional non-statutory public consultation was held for a period of eight weeks, between June 2023 and August 2023. The 2023 non-statutory consultation presented a preferred draft alignment which showed potential positions for overhead line and associated pylons, centreline for the underground cable sections, Cable Sealing End (CSE) compounds and connection substations. Changes to the proposed plans, both inside and outside of the 2022 preferred draft corridor were presented as part of this.

The feedback received during the 2022 and 2023 non-statutory consultations has been carefully reviewed and considered, alongside the findings of environmental and engineering studies. We have also backchecked and reviewed previous studies.

This report presents the changes that have been made to the Project since the 2023 non-statutory consultation.

In summary, the areas where the most extensive changes to the 2023 preferred draft alignment have been made) are:

- south of Norwich Main Substation between RG01 and RG07;
- around 2 km in the Waveney Valley between approximately RG84 and RG90 (potential for the use of underground cable on a slightly modified alignment referred to as the Waveney Valley Alternative);
- east of Worham near Brook Farm Airstrip between RG90 and RG100;
- north and west of Mellis Common between RG103 and RG116;
- south of Offton between RG191 to RG200;
- to the north of Dedham Vale National Landscape (an Area of Outstanding Natural Beauty (AONB)) between approximately JC26 to JC34, moving the CSE compound to the north of Raydon airstrip;
- moving the western CSE compound at Fairstead to the east; and
- adoption of the existing gas pipeline corridor at Dunton Hills for the overhead line alignment.

This report also describes, for these areas, the alternatives that have been considered and the reasons why they were less preferred.

No final decision as to the means of reinforcement has been made and any relevant decision to be made following consideration of the feedback to the 2024 statutory consultation and will be

the subject of reconsideration and backchecking throughout the process of developing the Project.

Our current draft proposals for the Project (referred to as the 2024 preferred draft alignment) as presently indicated and which are the subject of the statutory consultation comprise:

- a new 400 kV electricity transmission connection of approximately 184 km overall length from Norwich Main Substation to Tilbury Substation via Bramford Substation comprising:
 - approximately 159 km of new overhead line supported on approximately 510 steel lattice pylons (approximately 50 m in height) some of which are gantries (typically up to 15m in height) within proposed CSE compounds, or existing or proposed substations; and
 - approximately 25 km of 400 kV underground cabling (some of which is located through the Dedham Vale National Landscape (an AONB)).
- six new CSE compounds, each with a permanent access, to connect the overhead lines to the underground cables;
- a new 400 kV East Anglia Connection Node (EACN) substation, with a new permanent access, on the Tendring Peninsula. This is proposed to be an Air Insulated Switchgear (AIS) substation;
- substation extension works at the existing Norwich Main, and Bramford substations and works within the existing Tilbury Substation to connect and support operation of the new transmission connection; and
- temporary works associated with construction of the Project.

An alternative design at the Waveney Valley (referred to as the Waveney Valley Alternative) is also being considered and is the subject of consultation and ongoing assessment. This design alternative, if taken forward, would result in changes to those elements of the Project set out below. This would instead comprise:

- installation of approximately 157 km of new 400 kV overhead line;
- installation of approximately 27 km of 400kV underground cabling (some of which is located through the Dedham Vale National Landscape (an AONB); and
- eight new CSE compounds (each with a permanent access) to connect the overhead lines to the underground cables.

All other works not listed above would remain consistent with either alternative.

In other words, the Waveney Valley Alternative, if taken forward and based on the 2024 preferred draft alignment would comprise approximately 2 km less new 400 kV overhead line and approximately an additional 2 km of 400 kV underground cabling and two additional new CSE compounds, each with a permanent access, to connect the overhead lines to the underground cables.

In addition, third party utilities diversions and / or modifications would also be required to facilitate the construction of the Project. There would also be land required for mitigation, compensation and enhancement of the environment including Biodiversity Net Gain (BNG).

As well as the permanent infrastructure, land would also be required temporarily for construction activities including for example working areas for construction equipment and machinery, site offices, welfare, storage and temporary construction access.

The 2024 preferred draft alignment as presented in this Design Development Report reflects the use of standard lattice pylons. Appendix C to this report sets out how consideration has been given to alternative pylon types, including traditional lattice, low height lattice and the T-pylon.

If progressed with significant elements of overhead line, then it is likely the Project would be classified as a Nationally Significant Infrastructure Project (NSIP), and we would need to obtain 'development consent' under statutory procedures set by Government.

The feedback from the non-statutory and statutory consultations (as applicable) will be used to inform the final designs that will be put forward in the application for development consent. National Grid expects to submit an application for consent for the Project in 2025.

1. Introduction

1 Introduction

1.1 Purpose of this document

- 1.1.1 The purpose of this report is to describe how the Norwich to Tilbury (referred to as the 'Project' in this report) has evolved since the 2023 non-statutory consultation (undertaken between June and August 2023) in response to feedback to that consultation and further environmental and engineering studies. Further back check and reviews of the Project will be undertaken in response to feedback to the 2024 statutory consultation, and in the light of ongoing surveys and assessments.

1.2 Overview

- 1.2.1 National Grid Electricity Transmission (NGET) referred to as National Grid within this report, owns and maintains the national high-voltage electricity transmission network throughout England and Wales.
- 1.2.2 The transmission network connects the power from where it is generated to the regional Distribution Network Operators (DNO) who then supply businesses and homes.
- 1.2.3 National Grid holds the Transmission Licence for England and Wales, and their statutory duty is to develop and maintain an efficient, co-ordinated, and economical system of electricity transmission and to facilitate competition in the generation and supply of electricity, as set out in the Electricity Act 1989.
- 1.2.4 National Grid is working to build a cleaner, fairer, and more affordable energy system that serves everyone, powering the future of our homes, transport, and industry. The Project would support the UK's net zero target through the connection in East Anglia of new low carbon energy generation, and by reinforcing the local transmission network.
- 1.2.5 It is National Grid that is developing plans for the Project'.
- 1.2.6 The Project is a proposal by National Grid to reinforce the high voltage power network in East Anglia. The reinforcement is needed because the existing transmission network, even with current upgrading, will not have sufficient capacity for the new renewable energy (a substantial proportion of which is generated by offshore wind) that is expected to connect to the network over the next ten years and beyond. Completion of the Project, together with other new reinforcements across the country will meet this future energy transmission demand both in East Anglia and across the UK.
- 1.2.7 The Project proposes to reinforce the transmission network between the existing substations at Norwich Main in Norfolk, Bramford in Suffolk, and Tilbury in Essex as well as connecting new offshore wind generation and an interconnector proposed to come ashore on, or in the vicinity of, the Tendring Peninsula.
- 1.2.8 If progressed with significant elements of overhead line, then Norwich to Tilbury would be classified as a Nationally Significant Infrastructure Project (NSIP) and National Grid would need to obtain 'development consent' under statutory procedures set by Government. NSIPs are projects of certain types, over a certain size, which are considered by the Government to be of national importance, hence permission to build them needs to be given at a national level, by the relevant Secretary of State (SoS) (in this case the Secretary of State for Energy Security and Net Zero). Instead of applying to

the local authority for planning permission, the developer must apply to the Planning Inspectorate for a different permission called a Development Consent Order (DCO).

- 1.2.9 If the Project is an NSIP National Grid would need to apply for development consent to the Planning Inspectorate. If accepted, the examining authority would be appointed (consisting of one or more examining inspectors) who, after a period of public examination, would make their recommendation to the SoS for Energy Security and Net Zero, who in turn would decide on whether development consent should be granted for the Project. The timescale between acceptance of the submission and a decision is approximately 18 months.

1.3 The need for the Project

- 1.3.1 Great Britain already has 8.5 gigawatts (GW) of offshore wind energy in operation, and another 1.9 GW under construction. The Government's Energy White Paper (EWP) (December 2020) outlines a plan to increase energy from offshore wind to 40 GW by 2030 (with this Government target being increased in April 2022 to 50 GW) and this Project would support achieving that target.
- 1.3.2 New connections for new offshore wind and nuclear power generation projects and for interconnectors into East Anglia are expected to continue in addition to the current contracted position. These new connections are being constructed or are expected to connect into substations at Necton, Norwich Main, Bramford, Friston and Sizewell. Additionally, agreements are in place with two offshore wind farm projects and an interconnector based on their connections into a new East Anglia Connection Node (EACN) substation. National Grid has a duty to facilitate new connections and maintain a safe National Electricity Transmission System (NETS) and has considered the capability of the existing network to support such connections.
- 1.3.3 East Anglia's 400 kV electricity transmission network was built in the 1960s. It was built to supply regional demand, centred around Norwich and Ipswich. With the growth in new energy generation from offshore wind, nuclear power and interconnection with other countries, there will be more electricity connected in East Anglia than the network can currently accommodate.
- 1.3.4 As a result, and to comply with its duties, National Grid needs to reinforce the electricity network to allow power to be imported to and exported from East Anglia. The reinforcement would provide additional capability to connect to areas of demand, allowing power flows cross boundaries, and linking into interconnectors to and from Europe.
- 1.3.5 The Project could also connect new offshore wind farms off the Essex coast and a European interconnector to the electricity transmission network. Two offshore wind farms, the North Falls Offshore Wind Farm and Five Estuaries Offshore Wind Farm, and the Tarchon Energy Interconnector (from Germany) are currently in development. If consented, they are expected to be operational by the end of 2030.
- 1.3.6 As part of the development of a project National Grid establishes the need and identifies a preferred strategic proposal to meet requirements. This can include multiple potential start, intermediate and end points. Options are narrowed down, and the best performing are identified. Alternative strategic options for delivering the preferred solution are developed and appraised to identify a preferred strategic proposal. This will then be the subject of consultation, feedback reviews, design evolution and testing with a back-check and review process.

- 1.3.7 In 2022, National Grid carried out an initial assessment of the strategic options available to meet the needs case set out above.
- 1.3.8 This assessment identified a range of combinations of circuit options covering both East Anglia and the south-east. For each of these combinations of options, National Grid undertook an appraisal of deliverability, considered the system benefit that the reinforcement provided, considered environmental and socio-economic factors, and considered the cost benefit analysis completed by National Grid ESO.
- 1.3.9 Further detail on National Grid's approach to consenting and each of the potential strategic options is provided in the Corridor and Preliminary Routeing and Siting Study (CPRSS)¹, published in April 2022 to inform the initial non-statutory consultation. The CPRSS explains why, at the early pre-statutory stage of consultation, the offshore strategic options were not being progressed for now.
- 1.3.10 The currently preferred strategic option that best meets National Grid obligations under Section 9 of the Electricity Act 1989 and aligns with the NPSs (EN-1 and EN-5) is the onshore overhead line option between Norwich Main and Bramford Substations, and overhead line (with underground section) from Bramford Substation, via a new EACN substation to Tilbury Substation.
- 1.3.11 In arriving at this preferred onshore strategic option, National Grid looked at different onshore connection locations between either Norwich Main or Necton Substations and Bramford Substation or a new substation in the Twinstead area, location options for a new substation to connect the two offshore windfarm customers, and options for Dedham Vale Area National Landscape (an AONB).
- 1.3.12 Details of these options and the rationale for the decisions made to date are provided in the CPRSS, the 2023 Strategic Options Backcheck and Review² and the 2024 Strategic Options Backcheck and Review. Further detail on how the Project progressed prior to the statutory consultation is provided in the 2023 Design Development Report³ and the 2024 Design Development Report.
- 1.3.13 'Backcheck' and periodic update is undertaken to respond to new information and in order to ensure that the outcome of each stage remains valid and National Grid continues to review its proposals. As no final decision has been made, and as options will be reconsidered and backchecked throughout the process having regard to consultation responses and other relevant information, none of the conclusions should be seen as final.

National Grid Approach

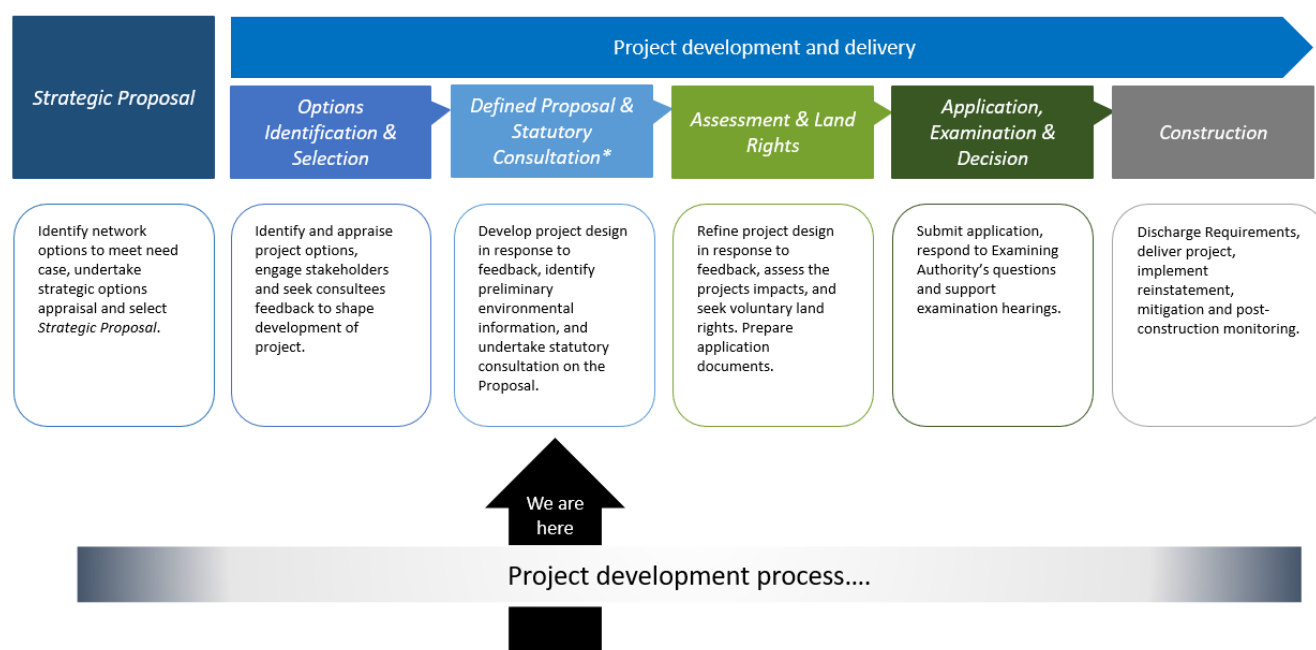
- 1.3.14 National Grid has adopted a structured approach to project development and consenting (see Figure 1.1).

1 <https://www.nationalgrid.com/electricity-transmission/document/142461/download>

2 <https://www.nationalgrid.com/electricity-transmission/document/149281/download>

3 <https://www.nationalgrid.com/electricity-transmission/document/149161/download>

Figure 1.1 – National Grids consenting process



1.3.15 To date National Grid has identified a Strategic Proposal and has undertaken 'Options Identification and Selection' as reported and published in the CPRSS, the 2023 Strategic Options Backcheck and Review, the 2023 Design Development Report, and the 2024 Design Development Report.

1.3.16 The Project is now the subject of a statutory consultation as set out in the Planning Act 2008. A list of all the documents produced for the statutory consultation is available on the project website.

Project Description

1.3.17 The Project would comprise a 400 Kilovolt (kV) electricity transmission connection over a distance of approximately 184 kilometres (km).

1.3.18 Our current draft proposals for the Project, referred to as the 2024 preferred draft alignment, which are the subject of the 2024 statutory consultation, comprising:

- a new 400 kV electricity transmission connection of approximately 184 km overall length from Norwich Main Substation to Tilbury Substation via Bramford Substation comprising:

approximately 159 km of new overhead line supported on approximately 510 steel lattice pylons (approximately 50 m in height) some of which are gantries (typically up to 15m in height) within proposed Cable Sealing End (CSE) compounds, or existing or proposed substations; and

approximately 25 km of 400 kV underground cabling (some of which is located through the Dedham Vale Natural Landscape (an AONB).

- six new CSE compounds, each with new permanent access, to connect the overhead lines to the underground cables.

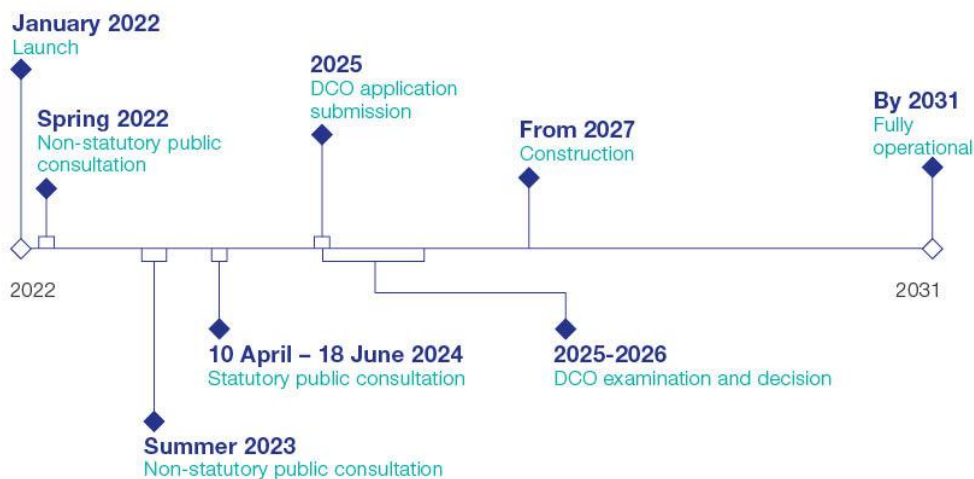
- a new 400 kV EACN substation, with a new permanent access, on the Tendring Peninsula. This is proposed to be an Air Insulated Switchgear (AIS) substation;
- substation extension works at the existing Norwich Main, and Bramford substations and works within the existing Tilbury Substation to connect and support operation of the new transmission connection; and
- temporary works associated with construction of the Project.

- 1.3.19 An alternative design at the Waveney Valley (referred to as the Waveney Valley Alternative) is also being considered and is the subject of consultation and ongoing assessment. This design alternative, if taken forward, would result in changes to those elements of the Project set out below. This would instead comprise:
- installation of approximately 157 km of new 400 kV overhead line;
 - Installation of approximately 27 km of 400 kV underground cabling (some of which is located through the Dedham Vale National Landscape (an AONB); and
 - eight new CSE compounds (each with a permanent access road) to connect the overhead lines to the underground cables.
- 1.3.20 All other works not listed in the above would remain consistent with either alternative.
- 1.3.21 In other words, the Waveney Valley Alternative, if taken forward and based on the 2024 preferred draft alignment would comprise approximately 2 km less new 400 kV overhead line and approximately an additional 2 km of 400 kV underground cabling and two additional new CSE compounds, each with a permanent access, to connect the overhead lines to the underground cables.
- 1.3.22 In addition, third party utilities diversions and / or modifications would also be required to facilitate the construction of the Project. There would also be land required for mitigation, compensation and enhancement of the environment including Biodiversity Net Gain (BNG).
- 1.3.23 As well as the permanent infrastructure, land would also be required temporarily for construction activities including for example working areas for construction equipment and machinery, site offices, welfare, storage, and temporary construction access.
- 1.3.24 The Project would be designed, constructed, and operated in accordance with applicable health and safety legislation. The Project would also need to comply with design safety standards including the NETS Security and Quality of Supply Standard (SQSS), which sets out the criteria and methodology for planning and operating the NETS. This informs a suite of National Grid policies and processes, which contain details on design standards required to be met when designing, constructing, and operating assets such as proposed for the Project.

Project Timeline

- 1.3.25 A non-statutory consultation took place between April and June 2022. A further non-statutory consultation was undertaken between June and August 2023 to provide information on how the Project had developed in response to feedback from the 2022 non-statutory consultation and further environmental and engineering studies. As required under the Planning Act 2008, a statutory consultation is taking place between April and May 2024.

1.3.26 An indication of the Project timelines through to operation is provided below.



1.4 Structure of this document

1.4.1 The report is structured as follows:

- Chapter 2 – provides an overview of the legislation and national policy relevant to the Project;
- Chapter 3 – provides an overview of the 2023 non-statutory consultation;
- Chapter 4 – outlines the back check of the previous routeing and siting studies undertaken by National Grid;
- Chapter 5 – describes the 2024 preferred draft alignment and how feedback on the 2023 preferred draft alignment has influenced the proposals which are the subject of the 2024 statutory consultation;
- Chapter 6 – describes the temporary works that will be required; and
- Chapter 7 – sets out the next steps that will be undertaken prior to the submission of an application for a Development Consent Order.

1.4.2 The report also includes three Appendices:

- Appendix A – Consideration of National Policy Statements;
- Appendix B – External Schemes and Studies; and
- Appendix C - Consideration of Pylon Options.

2. Legislation and National Policy Context

2 Legislation and National Policy Context

2.1 Introduction

- 2.1.1 This chapter sets out a summary of legislation and national policy relevant to the Project.

2.2 Planning Act 2008

- 2.2.1 The Planning Act 2008 introduced a new consenting procedure for NSIPs. Under Section 14(1)(b) and Section 16 of the Planning Act 2008 and the Planning Act (Electric Lines) Order 2013 a project that involves the installation of an electric line above ground of more than 2 km, which will operate at 400 kV in England is an NSIP.
- 2.2.2 For an NSIP the grant of development consent is required by the making of a DCO under the Planning Act 2008.
- 2.2.3 Only a proposed new above ground electricity line would be an NSIP by virtue of the definitions in the Planning Act. Other development, such as underground cables, may be granted development consent as associated development within the meaning of Section 115 of the Planning Act.
- 2.2.4 As noted in Section 1 above if progressed with significant elements of overhead line, then Norwich to Tilbury would be classified as a Nationally Significant Infrastructure Project (NSIP) and National Grid would need to obtain ‘development consent’ under statutory procedures set by Government. NSIPs are projects of certain types, over a certain size, which are considered by the Government to be of national importance, hence permission to build them needs to be given at a national level, by the relevant Secretary of State (SoS) (in this case the Secretary of State for Energy Security and Net Zero). Instead of applying to the local authority for planning permission, the developer must apply to the Planning Inspectorate for a Development Consent Order (DCO).
- 2.2.5 Section 104 of the Planning Act 2008 states at (2)(a) that the Secretary of State must have regard to any national policy statement which has effect in relation to development of the description to which the application relates.

2.3 Electricity Act 1989

- 2.3.1 Section 9(2) of the Electricity Act 1989 places general duties on National Grid as a licence holder ‘to develop and maintain an efficient, co-ordinated and economical system of electricity transmission...’. In addition, Section 38 and Schedule 9 of the Electricity Act 1989 require National Grid, when formulating proposals for new lines and other works, to:
- “...have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and shall do what [it] reasonably can mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects”.*
- 2.3.2 Under Licence Condition C8 (Requirement to offer terms) of the Transmission Licence Standard Conditions (OFGEM, 2022), NGET ESO has a duty to meet obligations relating to making offers to provide connections to the Transmission System. In summary, where

any person applies for an offer, National Grid shall offer to enter into an agreement(s) to connect, or to modify an existing connection, to the Transmission System and the offer shall make detailed provision regarding:

- the carrying out of works required to connect to the Transmission System;
- the carrying out of works (if any) in connection with the extension or reinforcement of the Transmission System; and
- the date by when any works required to permit access to the Transmission System (including any works to reinforce or extend the Transmission System) shall be completed.

2.4 National planning policy

- 2.4.1 In deciding an application for development consent Section 104 of the Planning Act 2008 requires the Secretary of State to determine the application in accordance with any relevant National Policy Statement (NPS). The NPSs relevant to this project are the Overarching National Policy Statement for Energy (EN-1) and the National Policy Statement for Electricity Networks Infrastructure (EN-5) which came into force in January 2024.
- 2.4.2 The National Policy Statement for Renewable Energy (EN-3 2024) also includes support for the onshore infrastructure required to deliver new offshore wind developments.
- 2.4.3 A more detailed review of the policies contained within the National Policy Statements is set out in Appendix A to this report.
- 2.4.4 Although this section and Appendix A consider the National Policy Statements designated in January 2024, as these are the policies which will be considered by the Secretary of State in reaching a decision, the Project has developed within the context of the previously adopted and emerging draft NPSs⁴ and reviewed against the updated policy set out in January 2024.

Overarching National Policy Statement for Energy (EN-1) (2024)

- 2.4.5 NPS EN-1 sets out the Government's overarching policy with regard to the development of NSIPs in the energy sector.
- 2.4.6 EN-1 recognises that to 'produce the energy required for the UK and ensure it can be transported to where it is needed, a significant amount of infrastructure is needed at both local and national scale. High quality infrastructure is crucial for economic growth, boosting productivity and competitiveness'. (para 2.1.3). It continues '*There is an urgent need for new electricity network infrastructure to be brought forward at pace to meet our energy objectives*' (paragraph 3.3.65).
- 2.4.7 Section 3.3 recognise that the volume of onshore reinforcement works needed to meet decarbonisation targets is substantial. National Grid ESO forecasts that over the next

⁴ The previously adopted and emerging draft National Policy Statements are:

- Overarching National Policy Statement for Energy (EN-1) (2011)
- Draft Overarching National Policy Statement for Energy (EN-1 (March 2023)
- National Policy Statement for Energy Networks Infrastructure (EN-5) (2011)
- Draft National Policy Statement for Energy Networks Infrastructure (EN-5) (March 2023)
- Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) (2023)

decade a doubling of north south power transfer capacity will be required. Specific mention is made of the need for *‘substantial reinforcement in East Anglia to handle increased power flows from offshore wind generation’* (paragraph 3.3.68).

- 2.4.8 Section 4.2 sets out the critical national priority for low carbon infrastructure. *‘Government has committed to fully decarbonising the power system by 2035, subject to security of supply, to underpin its 2050 net zero ambitions. More than half of final energy demand in 2050 could be met by electricity, as transport and heating in particular shift from fossil fuel to electrical technology’* (paragraph 4.2.1) concluding that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure.
- 2.4.9 For electricity grid infrastructure, all power lines in scope of EN-5 including network reinforcement and upgrade works, and associated infrastructure such as substations are CNP.
- 2.4.10 EN-1 also *‘sets out guidance on generic impacts of any of the types of energy infrastructure covered by the energy NPS’* in respect of matters such as air quality and emissions, biodiversity, dust and odour, flood risk, historic environment, landscape, land use, noise, and vibration, socio-economic, traffic and transport and waste management.

National Policy Statement for Electricity Networks Infrastructure (EN-5) (2024)

- 2.4.11 NPS EN-5 specifically relates to electricity networks.
- 2.4.12 As identified in EN-1, government has concluded that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure. *‘As stated in Section 4.2 of EN-1, to support the urgent need for new low carbon infrastructure, all power lines in scope of EN-5 including network reinforcement and upgrade works, and associated infrastructure such as substations, are considered to be CNP infrastructure’* (paragraph 2.1.5).
- 2.4.13 As set out in EN-1 (Section 4.2) the assessment principles outlined in Section 4 of EN-1 continue to apply to CNP infrastructure. Paragraphs 2.2.1 and 2.2.2 note that *‘The Secretary of State should bear in mind that the initiating and terminating points – or development zone – of new electricity networks infrastructure is not substantially within the control of the applicant’*. Siting is determined by:
- *the location of new generating stations or other infrastructure requiring connection to the network, and/or*
 - *system capacity and resilience requirements determined by the Electricity System Operator’*.
- 2.4.14 Paragraph 2.2.6 recognises that *‘....the locational constraints identified above do not, of course, exempt applicants from their duty to consider and balance the site-selection considerations set out below, much less the policies on good design and impact mitigation..’*
- 2.4.15 Paragraph 2.2.10 of EN-5 reiterates the duties of transmission and distribution licence holders under Section 9 of the Electricity Act 1989, both in relation to developing and maintaining an economical and efficient network and in formulating proposals for new electricity networks infrastructure, to *‘have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest...’*

- 2.4.16 Paragraph 2.4.1 notes that ‘*The Planning Act 2008 requires the Secretary of State to have regard, in designating an NPS and in determining applications for development consent to the desirability of good design*’.
- 2.4.17 Section 2.7 of the NPS deals with holistic planning. ‘...*the government envisages that, wherever reasonably possible, applications for new generating stations and their related infrastructure should be contained in a single application to the Secretary of State. However, a consolidated approach of this kind may not always be possible..*’.(para 2.7.2). ‘*This could be, for example, due to the differing lengths of time needed to prepare the applications for submission to the Secretary of State, or because a network application relates to multiple generation projects (which could be onshore or offshore), or because the works involved are strategic reinforcements required for a number of reasons.*’ (paragraph 2.7.3).
- 2.4.18 Section 2.8 deals with Strategic Network Planning and sets out that ‘A more strategic approach to network planning will ensure that network development keeps pace with renewable generation and anticipates future system needs’ (this is also referred to in paragraphs 2.13.1 - 2.13.13).
- 2.4.19 Paragraph 2.9.7 recognises that ‘the government does not believe that the development of overhead lines is incompatible in principle with applicants’ statutory duty under Schedule 9 to the Electricity Act 1989, to have regard to visual and landscape amenity and to reasonably mitigate possible impacts thereon’.
- 2.4.20 Paragraph 2.9.16 recognise the importance of the guidelines provided in the Holford Rules ‘intended as a common-sense approach to overhead line design, were reviewed and updated by the industry in the 1990s and they should be embodied in the applicants’ proposals for new overhead lines. In brief the Holford Rules state that applicants should:
- avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the first line in the first place, even if the total mileage is somewhat increased in consequence;
 - avoid smaller areas of high amenity value, or scientific interests by deviation; provided that this can be done without using too many angle towers, i.e. the bigger structures which are used when lines change direction;
 - other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers;
 - choose tree and hill backgrounds in preference to sky backgrounds wherever possible. When a new overhead line has to cross a ridge; secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees;
 - prefer moderately open valleys with medium or moderate levels of tree cover where the apparent height of towers will be reduced, and views of the line will be broken by trees;
 - where country is flat and sparsely planted, and unless specifically preferred otherwise by relevant stakeholders, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires, and cables, so as to avoid a concentration of lines or ‘wirescape’; and

- approach urban area through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, carefully assess the comparative costs of the undergrounding.

2.4.21 Paragraph 2.9.18 refers to the Horlock Rules, guidelines for the design and siting of substations) setting out that ‘these principles should be embodied in applicants’ proposals for the infrastructure associated with new overhead lines. In brief the Horlock Rules state that:

- consider environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum;
- seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections;
- protect as far as reasonably practicable areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas;
- take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum;
- keep the visual, noise and other environmental effects to a reasonably practicable minimum; consider the land use effects of the proposal when planning the siting of substations or extensions;
- consider the options available for terminal towers, equipment, buildings, and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum;
- use space effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation;
- make the design of access roads, perimeter fencing, earth-shaping, planting, and ancillary development an integral part of the site layout and design, so as to fit in with the surroundings;
- in open landscape especially, high voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance; and
- study the inter-relationship between towers and substation structures and background and foreground features so as to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.

2.4.22 Paragraph 2.9.20 covers undergrounding ‘*Although it is the government’s position that overhead lines should be the strong starting presumption for electricity networks developments in general, this presumption is reversed when proposed developments will*

cross part of a nationally designated landscape (i.e. National Park, The Broads, or Area of Outstanding Natural Beauty).

- 2.4.23 *It goes on ‘However, undergrounding will not be required where it is infeasible in engineering terms, or where the harm that it causes (see section 2.11.4) is not outweighed by its corresponding landscape, visual amenity, and natural beauty benefits. Regardless of the option, the scheme through its design, delivery, and operation, should seek to further the statutory purposes of the designated landscape. These enhancements may go beyond the mitigation measures needed to minimise the adverse effects of the scheme’ (paragraph 2.9.22) and ‘Additionally, cases will arise where – though no part of the proposed development crosses a designated landscape high potential for widespread and significant adverse landscape and/or visual impacts along certain sections of its route may result in recommendations to use undergrounding for relevant segments of the line’ (paragraph 2.9.23).*
- 2.4.24 *CNP is referred to again in paragraph 2.12.7: ‘As highlighted in EN-1 government has concluded that there is a CNP for the provision of nationally significant low carbon infrastructure. This includes for electricity grid infrastructure, all power lines in scope of EN-5 including network reinforcement and upgrade works, and associated infrastructure such as substations. This is not limited to those associated specifically with a particular generation technology, as all new grid projects will contribute towards greater efficiency in constructing, operating, and connecting low carbon infrastructure to the National Electricity Transmission System. This includes infrastructure identified in the Holistic Network Design and subsequent strategic network design exercise’.*

National Policy Statement for Renewable Energy (EN-3) (2024)

- 2.4.25 *NPS EN-3 also includes support for the onshore infrastructure required to deliver new offshore wind developments.*
- 2.4.26 *Section 2.8 deals with offshore wind. Paragraph 32.8.1 states that ‘As set out in the British Energy Security Strategy, the Government expects that offshore wind Will play a significant role in meeting demand and decarbonising the energy system. The ambition is to deploy up to 50GW of offshore wind capacity (including up to 5GW floating wind) by 2030, with an expectation that there will be a need for substantially more installed offshore capacity beyond this to achieve net zero carbon emissions by 2050’.*
- 2.4.27 *Paragraphs 2.8.24 to 2.8.33 (inclusive) reiterate the position set out in EN-1 and EN-5 that a co-ordinated approach to onshore-offshore transmission is required. Paragraph 2.8.25 states that ‘The previous standard approach to offshore-onshore connection involved a radial connection between single wind farm projects and the shore. A coordinated approach will involve the connection of multiple, spatially close, offshore wind farms and other offshore infrastructure, wherever possible, as relevant to onshore networks’.*
- 2.4.28 *The NPS also includes references to CNP Infrastructure outlining that the assessment principles outlined in Section 4 of EN-1 continue to apply to this. Applicants must show how any likely significant negative effects would be avoided, reduced, mitigated, or compensated for, following the mitigation hierarchy. Early application of the mitigation hierarchy is strongly encouraged, as is engagement with key stakeholders including Statutory Nature Conservation Bodies (SNCB), both before and at the formal pre-application stage.*

National Planning Policy Framework (NPPF) (2023)

- 2.4.29 Paragraph 5 of NPPF states that the '*Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant NPSs for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework (NPPF))*'.
- 2.4.30 While the NPSs remain the prime decision-making documents, the NPPF may require consideration and it is therefore included here for completeness.

3 Non-Statutory Consultation 2023

3 Non-Statutory Consultation 2023

3.1 Background

Context

3.1.1 National Grid held a non-statutory consultation between 21 April 2022 and 16 June 2022. A further round of non-statutory consultation was undertaken between 27 June and 21 August 2023. The aim of this further consultation in 2023 was to:

- provide an overview of the updated proposals to the public;
- present the 2023 preferred draft alignment;
- explain where changes that had been made to the proposals since the last consultation (held in 2022);
- ensure all stakeholders had the opportunity to provide feedback on the work to date; and
- outline next steps and the programme, and how proposals would be developed further.

The Consultation Corridor

3.1.2 An overview of the preferred draft alignment, as presented at the 2023 non-statutory consultation, was provided in the 2023 Project Background Document⁵ and is set out below.

South Norfolk

3.1.3 The proposed new reinforcement would start at Norwich Main Substation in Norfolk. Out of Norwich Main, the proposed overhead line would head south, running to the east of Mulbarton, Tacolneston and Shelfanger before routeing to the west of Roydon on the border with Mid Suffolk.

⁵ nationalgrid.com/electricity-transmission/document/149151/download

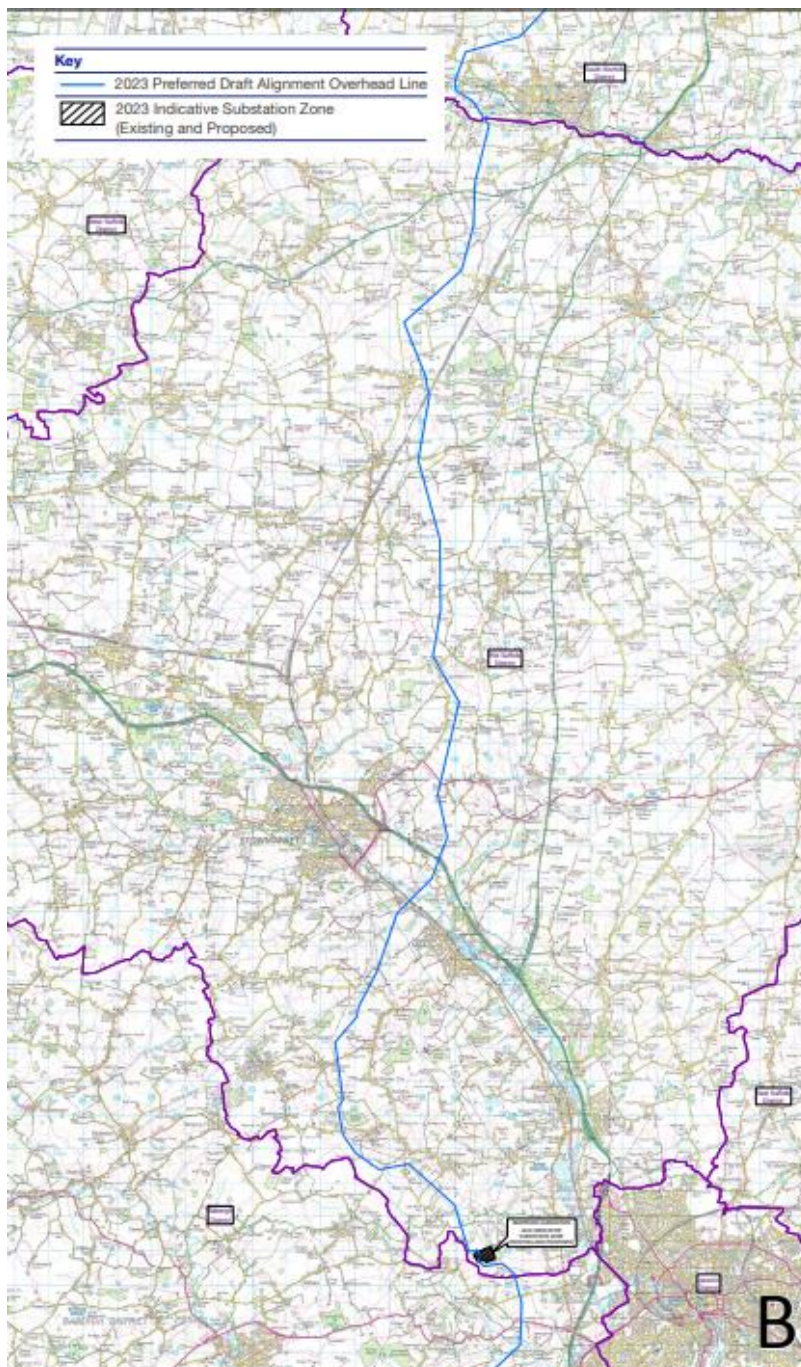
Figure 3.1 Route overview – South Norfolk



Mid Suffolk (and Babergh North of the Substation)

- 3.1.4 From the county boundary between South Norfolk and Mid Suffolk, the overhead line would run south, passing to the west of Mellis and to the east of Gislingham before crossing the railway. It would then continue south past Stowupland and Needham Market, where it would cross back over the railway, before turning eastwards at Offton, running north of Flowton, and connecting into Bramford Substation. Some work would be required at Bramford Substation to connect the new line into it.

Figure 3.2 Route overview – Mid Suffolk (and Babergh north of the substation)



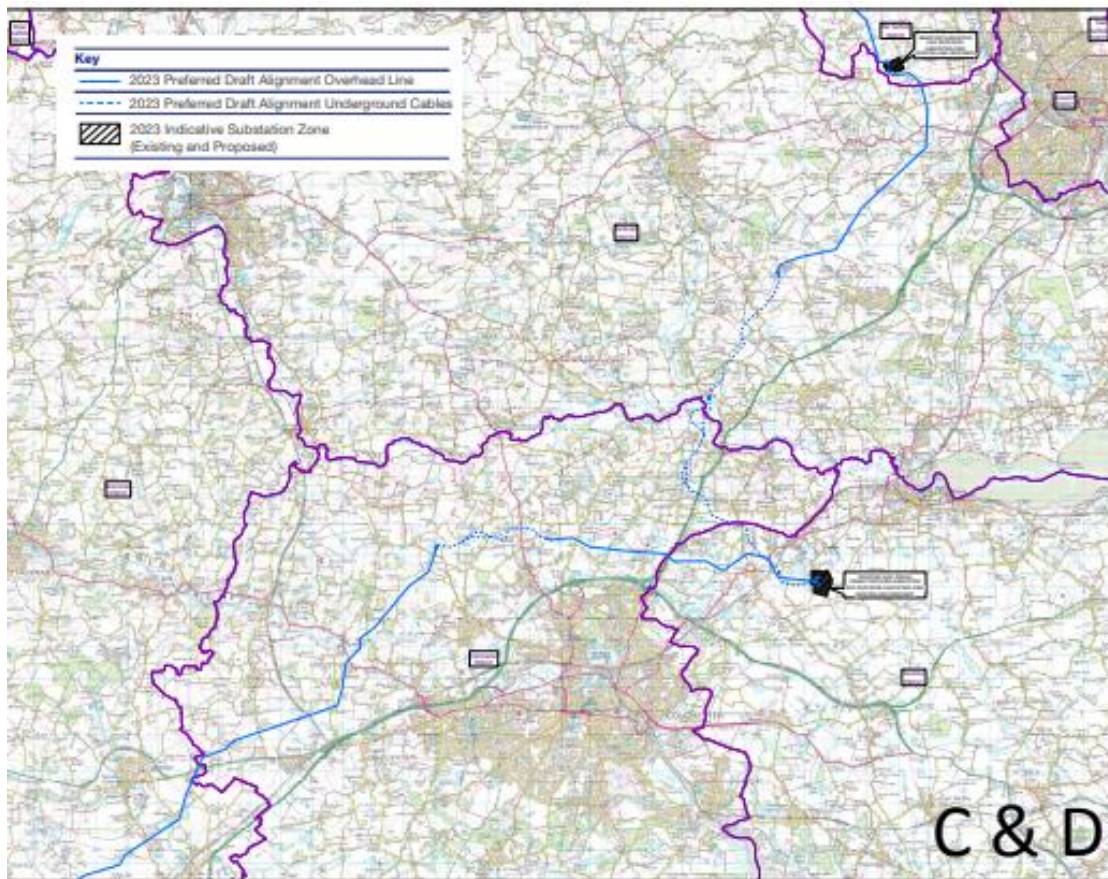
Babergh, Tendring and Colchester

- 3.1.5 From Bramford Substation, the proposed overhead line would cross immediately into the district of Babergh.
- 3.1.6 It would then run south-easterly, passing to the west of Washbrook and Copdock and Little Wenham and passing the north side of Notley Enterprise Park. Here the overhead line would transition to underground cable at a CSE compound adjacent to the south-western corner of Notley Enterprise Park.
- 3.1.7 The underground cable alignment would then run to the east of Raydon and west of Holton St Mary. It would then cross the border into the Colchester district briefly, running past the east of Langham and crossing the A12. The underground cable alignment would then cross into the Tendring district, turning eastwards into the Tendring Peninsula,

passing the north of Ardleigh, and crossing the railway to the site of the EACN substation. Underground cables are proposed in this section, crossing the designated Dedham Vale AONB.

- 3.1.8 From the EACN substation, the overhead line alignment would head west out of the substation, crossing back over the A12 towards Great Horkesley. Here the overhead line would transition to underground cable at a CSE compound sited to the north-east of Horkesley plantation. Due to limited space and to reduce the extent of tree removal, the underground cable alignment is expected to require a split corridor arrangement to the south of Knowles' Farm before reaching another CSE compound to the west of Crabtree Lane, where the underground cable would transition to overhead line.
- 3.1.9 From here, the overhead line alignment would continue south-west, passing to the west of West Bergholt before crossing the A12, running north of Marks Tey and into the Braintree district.

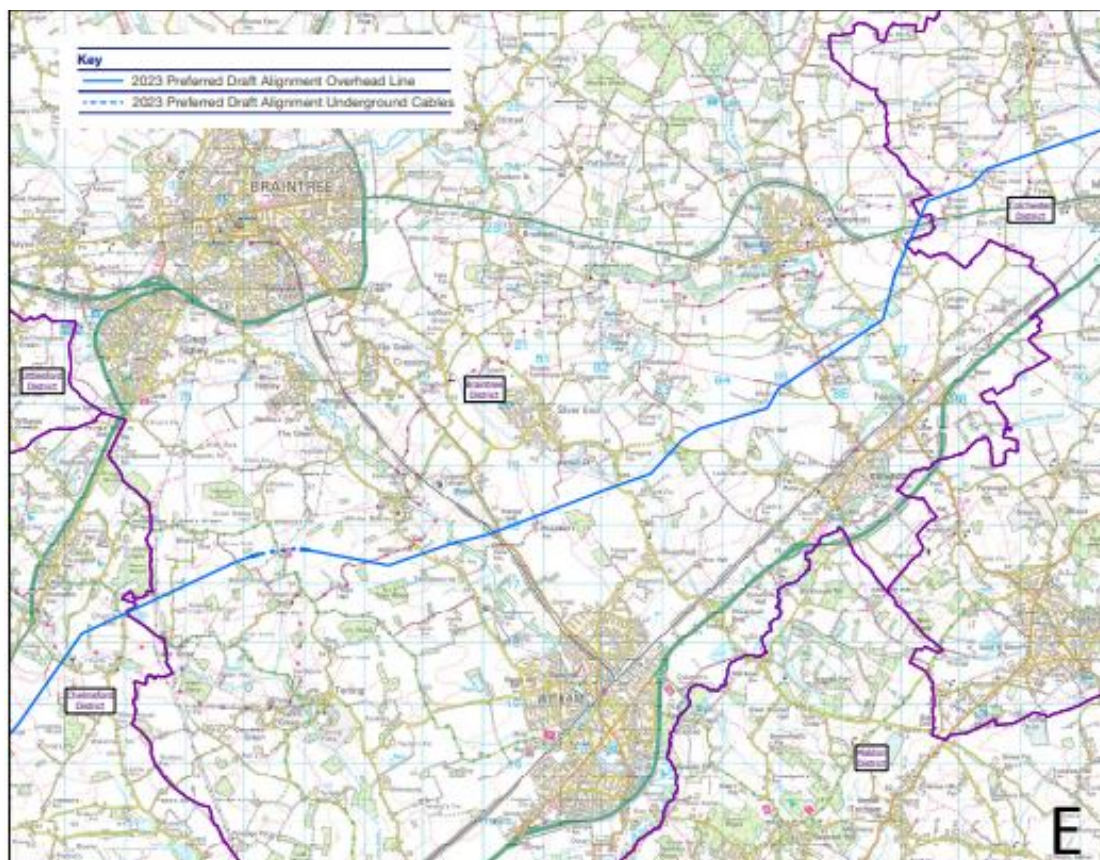
Figure 3.3 Route overview – Babergh, Tendring & Colchester



Braintree

- 3.1.10 After crossing into the Braintree district, the overhead line alignment would continue south-west. The alignment would pass to the north of Witham and the south of Silver End before crossing the railway, again heading south-west into Chelmsford district.

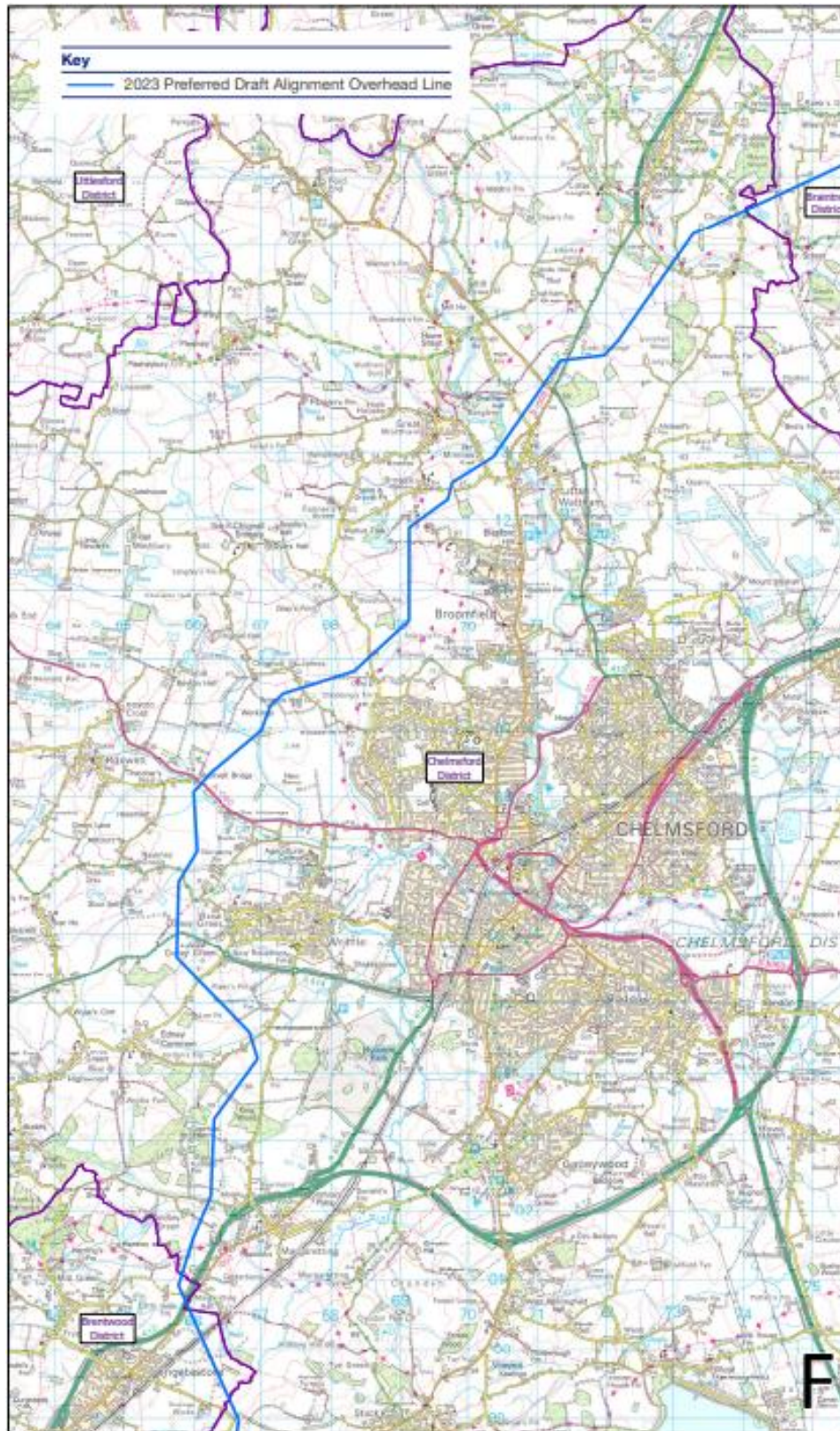
Figure 3.4 Route overview – Braintree



Chelmsford

- 3.1.11 The overhead line alignment would enter the district from the north-east and would run to the north of Chelmsford. From there it would head south on the western side of the City, and to the west of Writtle. The alignment would then continue south, passing to the west of Margaretting, and crossing over the A12 to the north of Ingatestone on the Brentwood district border, it briefly re-enters Chelmsford district to the east of Ingatestone.

Figure 3.5 Route overview – Chelmsford



Basildon and Brentwood

- 3.1.12 Passing to the north and east of Ingatestone, the overhead line would cross the A12 and the railway in the north of the Brentwood district. It would then travel directly south, crossing multiple times between the Chelmsford, Basildon, and Brentwood districts. Passing to the east of Brentwood and the west of Billericay, the alignment would continue south, crossing the A127 and railway on the border of the Thurrock district.

Figure 3.6 Route overview – Basildon and Brentwood



Thurrock

- 3.1.13 The overhead line alignment would continue south, passing Bulphan to the west and Horndon on the Hill to the east. It would then head east, then south, crossing the A13 to the north-east of Southfields, before heading south, to the west of Linford. Here, the overhead line would transition to underground cable at a CSE compound, proposed to be sited to the north of the Lower Thames Crossing proposals. The underground cable alignment would then run south into Tilbury Substation.
- 3.1.14 Works would be required at Tilbury Substation to connect the new reinforcement into the substation.

Figure 3.7 Route overview – Thurrock



3.2 Responses to 2023 non-statutory consultation

- 3.2.1 A total of 4167 feedback submissions were received during the consultation period from local communities, stakeholders, and other consultees. This comprised of paper response forms, online response forms, emails, and letters.

Process

- 3.2.2 The feedback received during the 2023 non-statutory consultation has been carefully reviewed and considered, alongside ongoing technical work on the engineering design and the environmental impact assessment process.
- 3.2.3 Feedback that proposed design changes was carefully considered in the context of environmental and socio-economic constraints and opportunities, engineering feasibility and cost, and planning policy considerations.
- 3.2.4 The process of considering the proposed changes comprised of an initial filter for benefit and feasibility, an assessment incorporating inputs from relevant technical experts, and further stages of additional study if required.
- 3.2.5 The outcome of the consideration of potential design changes was either that it informed the current draft proposals, or that the change was not considered further following balanced and informed consideration. The current draft proposals will be subject to ongoing back-check and review in response to all feedback and further engineering and environmental studies.

Key Changes

- 3.2.6 Feedback responses commented on the proposed location of the permanent assets such as the location of individual pylons, sections of underground cables and CSE compounds.
- 3.2.7 The areas where the most extensive changes to the 2023 preferred draft alignment have been made are:
- South of Norwich Main Substation between RG01 and RG07;
 - around 2 km in the Waveney Valley between approximately RG84 and RG90 (potential for the use of underground cable on a slightly modified alignment referred to as the Waveney Valley Alternative);
 - East of Worham near Brook Farm Airstrip between RG90 and RG100;
 - North and west of Mellis Common between RG103 and RG116;
 - South of Offton between RG191 to RG200;
 - to the North of the AONB between approximately JC26 to JC34, moving the CSE compound to the north of Raydon airstrip;
 - moving the western CSE compound at Fairstead to the east; and
 - adoption of the existing gas pipeline corridor at Dunton Hills for the overhead line alignment.

- 3.2.8 Further details on the consideration of proposed changes to the 2023 preferred draft alignment, the changes summarised above, and the further development of the Project design since the 2023 non-statutory consultation, are provided in Chapter 5 of this report.

4. Backcheck and review

4 Backcheck and review

4.1 Context

- 4.1.1 The development of any project is always evolving and iterating as the knowledge about the project, and the potential areas in which it will be sited, grows and / or alters. In addition, previous preliminary assumptions and/or decisions are the subject of constant checking and backchecking as part of the consideration and engagement process. Any description of the assessment and rationale for non-final decisions (particularly at non-statutory stages of a potential project) must be understood in that context.
- 4.1.2 This chapter provides a backcheck and review, following the 2023 non-statutory consultation, of the previous stages of the Projects development as undertaken in the:
- Strategic Options Backcheck and Review 2023⁶; and
 - Corridor and Preliminary Routeing and Siting Study (CPRSS) 2022⁷.

4.2 Strategic Proposal

Background

- 4.2.1 The need for the Project was identified as critical to take forward in both the 2021 and 2022 editions of the Network Options Assessment (NOA) 2021/22 Report (National Grid ESO, 2022).
- 4.2.2 An appraisal of strategic options (set out in the CPRSS) established the need case for the Project in more detail and identified a preferred strategic proposal. The preferred Strategic Proposal included three distinct elements:
- an offshore reinforcement between the south coast and East Anglia (whilst subject to separate study this was identified as between Sizewell and Richborough and referred to as the SEA Link project);
 - onshore reinforcement between Tilbury and Grain; and
 - onshore reinforcement between Norwich and Tilbury.

Strategic Options Backcheck

- 4.2.3 The Norwich to Tilbury 2023 Strategic Options Backcheck and Review (2023 SOBR) was prepared by (NGET) as part of the ongoing strategic options assessment and decision-making process involved in promoting new transmission projects.
- 4.2.4 The 2023 SOBR explained that, without reinforcement, the transmission system in East Anglia will have insufficient capacity to accommodate contracted and predicted growth in generation connecting in the area. Following consideration of options to meet system need the 2023 SOBR proposed to continue to take forward an interim preference of an onshore combination of:

⁶ <https://www.nationalgrid.com/electricity-transmission/document/149281/download>

⁷ [nationalgrid.com/electricity-transmission/document/142461/download](https://www.nationalgrid.com/electricity-transmission/document/142461/download)

- overhead line from Norwich Main to Bramford; and
- overhead line from Bramford via a new substation to Tilbury, with undergrounding through the Dedham Vale AONB.

4.2.5 Following the publication of the 2023 SOBR and the 2023 non-statutory consultation revised National Policy Statements have been published and the amount of generation from signed connection agreements has been reviewed. A further backcheck has been undertaken and the 2024 SOBR confirms that the interim preference for the onshore combination outlined above remains unchanged.

4.2.6 In addition to the considerations in the 2024 SOBR a number of other external announcements and publications have been issued since the 2023 non-statutory consultation. These include:

- the Offshore Co-ordination Support Scheme (OCSS);
- The Electricity System Operator East Anglia Network Study (March 2024); and
- publication of the 'East Anglia Transmission Network Reinforcement' commissioned jointly by Essex, Suffolk, and Norfolk County Councils (produced by Hirons Smart Energy Networks) published in 2023T March 2024).

4.2.7 These are summarised in Appendix B to this report (External schemes and studies).

4.3 Corridor and Preliminary Routeing and Siting Study

Options identification and selection

4.3.1 Following the optioneering process and the identification of the strategic proposal, routeing and siting was undertaken, resulting in the identification of a preferred corridor as reported in the CPRSS. The preferred corridor, as identified in the CPRSS, was consulted on at the non-statutory consultation in 2022. The backcheck and review described above (from paragraph 4.2.3), has concluded that at the current stage the preferred Strategic Proposal which provided the context for the CPRSS remains the same.

4.3.2 The 2024 backcheck and review exercise has been undertaken to identify whether there have been changes since the 2023 non-statutory consultation that may affect the conclusions of the CPRSS. The back check and review considered whether the changes set out below would have resulted in a different outcome for the CPRSS:

- changes to the legislative and policy context (including National Policy Statements 2024);
- changes to project assumptions and parameters;
- changes to the baseline; and
- changes proposed in feedback to the 2023 non-statutory consultation.

Legislative and Policy Context

4.3.3 National Grid has noted the UK government's nomination, of various areas of the east coast as part of the East Atlantic Flyway UNESCO World Heritage Site (WHS). This would bring together a coastal network of wetlands and protected spaces that include

Marine Protected Areas, Ramsar Sites, Special Protection Areas, and Special Areas of Conservation.

- 4.3.4 There have been no further announcements since the non-statutory consultation in 2023 and National Grid's current assumption continues to be that, if the nomination is successful, then any future management plan, would comprise similar protections to those applying to these designated sites as at present. The existing designations and protections were considered as part of routeing and siting as set out in the CPRSS, and as such it is not considered that the potential WHS designation is inconsistent with or would be undermined by the proposals.
- 4.3.5 As noted in Chapter 2 (and Appendix A) of this report the new National Policy Statements (EN-1, EN-3, and EN-5) and National Planning Policy Framework were published in January 2024 and December 2023 respectively. No changes have been identified in those documents that have implications for the backcheck.
- 4.3.6 In November 2023, following a review, all AONBs were renamed as 'National Landscapes' (noting they are renamed in policy but still referred to as AONBs in legislation). On 26th December 2023, a new duty came into force in English National Landscapes. This duty says that all '*relevant authorities*' (generally, those with a public function), 'must seek to further the purposes' of the designated landscape; for National Landscapes, this purpose is conserving and enhancing natural beauty'. This duty is set out in Section 245 of the Levelling UP and Regeneration Act 2023⁸.
- 4.3.7 AONBs were considered within the CPRSS, and the recent changes would not have affected the conclusions.

Assumptions and Parameters

- 4.3.8 The high-level assumptions and parameters have been reviewed and the following concluded:
- the objectives and strategic context of the Project are unchanged and remain valid. The inherent need for the Project to reinforce the National Electricity Transmission System and connect new low carbon generation to meet the government's Net Zero commitments remains with new connections exceeding system capacity;
 - the approach to Routeing and Siting and the Options Identification and Selection Process continues to be as set out in Chapter 3 of the CPRSS;
 - the grant funding awarded under the OCSS does not, at this stage, change the requirement for the EACN substation as part of the Project;
 - until such time as studies conclude and connection agreements are modified, National Grid must continue to meet its licence obligations and progress with studies to fulfil the signed agreements for connections at the EACN substation;
 - the customers with signed connection agreements at the EACN substation are currently continuing to progress their projects connecting at the EACN substation;
 - an increase in the proposed extent of underground cable in response to further feedback from the 2023 non-statutory consultation and further evaluation is not considered to change previous decision making on the preferred corridor; and

⁸ <https://www.gov.uk/government/news/new-laws-to-speed-up-planning-build-homes-and-level-up>

- the levels of constraint represented by each category of environmental receptor remain the same as those set out in the CPRSS.

Baseline Conditions

- 4.3.9 The baseline information for those topics covered by the CPRSS has been reviewed to establish if there have been any relevant changes since completion of the CPRSS that may have changed the decision making. In conclusion:
- biodiversity and historic environment - there have been no material changes to the baseline, i.e. no new designations have been confirmed;
 - landscape and views - the renaming of the Dedham Vale Area of Outstanding Natural Beauty to a 'National Landscape' does not materially alter the sensitivities, although there has been a strengthening of the duty for relevant authorities to 'seek to further' their purposes. We have taken account of the policy update in our technology selection and routeing as well as considering its relevance to consideration of mitigation as the project detail is refined through to Development Consent Order submission; and
 - landscape character; landscape designations; recreational routes; and residential properties - no material changes to the baseline have been identified.
- 4.3.10 The planning baseline has also been reviewed with respect to planning allocations and planning applications.
- 4.3.11 There has been no change to the planning allocations baseline, however, there have been a number of planning applications for development within the consultation corridor, for example solar farms and battery energy storage systems. Whilst important considerations for the development of an alignment, none of these applications would have altered the identification of the 2022 consultation corridor as the preferred option.

Consultation Feedback

- 4.3.12 Feedback received to the 2023 non-statutory consultation and the development of the 2024 preferred draft alignment has resulted in changes outside the 2022 consultation corridor. The changes made, whether prompted by feedback, assessments or in response to technical appraisal are set out in Section 5 below.

Conclusion

- 4.3.13 On the basis of the information set out above it has been concluded that the current preferred Strategic Proposals which provided the context for the CPRSS remains valid and an appropriate basis on which to take the Project forward at this stage.
- 4.3.14 No further changes have been identified which would result in a change to the consultation corridors set out in the CPRSS other than those areas which were the subject of the 2023 non-statutory consultation.
- 4.3.15 National Grid will continue to backcheck and review its proposals as the Project progresses and will respond to any new baseline information, legislative changes and feedback received.

5. Development of the 2024 Preferred Draft Alignment

5 Development of the 2024 Preferred Draft Alignment

5.1 Policy Context

- 5.1.1 The context throughout the development of the Project is set by legislation and the policy framework within the Electricity Act and National Policy Statements EN-1, EN-3, and EN-5. Earlier stages of the Project were developed in the context of the 2011 versions of the NPS and the subsequent consultation drafts. This stage has been updated with the new NPSs published in 2024 the details of which, are summarised in the preceding sections of this report, and in more detail in Appendix A.

5.2 Introduction

Overview

- 5.2.1 For the purposes of this report and the initial preliminary environmental impact assessment, the 2024 preferred draft alignment as presented in this document reflects the use of standard lattice pylons and where pylons, underground cables, CSE compounds (where underground cables join with overhead lines) and where the new EACN substation might be located. Consideration of alternative pylon designs (including 'traditional lattice, low height lattice and the T-pylon) is set out in Appendix C. At the current time the Project is being progressed with traditional lattice pylons however this will continue to be back checked with the final design being submitted in the application for a DCO (if an overhead line is progressed).
- 5.2.2 Feedback received from the 2023 non-statutory consultation (also back checked against 2022 consultation feedback) led to the identification of a number of potential design changes. These changes have been carefully considered in the context of environmental and socio-economic constraints and opportunities, engineering feasibility and cost, and planning policy.
- 5.2.3 The process of considering design changes comprised of
- an initial filter for benefit and feasibility;
 - an assessment incorporating inputs from relevant technical experts; and
 - further stages of additional study if required.
- 5.2.4 The outcome, following balanced and informed consideration, was either that a change was included in the Project design, or that the proposed change was not preferred (for example it might create other environmental impacts that would outweigh the benefit the change might otherwise create) and therefore no change was made.
- 5.2.5 The areas where the most extensive changes to the 2023 preferred draft alignment have been made are:
- South of Norwich Main Substation (described from paragraph 5.4.13);
 - around 2 km in the Waveney Valley (potential for the use of underground cable on a slightly modified alignment referred to as the Waveney Valley Alternative) (described from paragraph 5.4.31);

- East of Wortham near Brook Farm Airstrip (described from paragraph 5.4.59);
- North and west of Mellis Common (described from paragraph 5.4.64);
- South of Offton (described from paragraph 5.4.89);
- to the North of the AONB, moving the CSE compound to the north of Raydon airstrip (described from paragraph 5.4.104);
- moving the western CSE compound at Fairstead to the east (described from paragraph 5.4.171); and
- adoption of the existing gas pipeline corridor at Dunton Hills for the overhead line alignment (described from paragraph 5.4.211).

5.2.6 When specific changes are requested in respect of an individual pylon or a small number of pylons, their implementation has knock on effects along the alignment. For example, a request to move a specific pylon out of a main view from a property is likely to require the position of a number of pylons to either side of that pylon to be adjusted to even out the span lengths between pylons.

5.2.7 Similarly moving a pylon off the alignment, to increase separation from a feature, would typically see the alignment and pylon positions to each side adjusted, potentially as far as the next angle pylon where the alignment changes direction. This approach was preferred over the alternative of adding multiple angle pylons to achieve a localised change. As an example, achieving a 50 m change westwards to reduce effects around pylon RG033⁹ has required small adjustments to the positions of ten pylons (all by less than around 50m) along a 3.7 km section of the 2023 preferred draft alignment (see paragraph 5.4.21 below) with the potential effects from each pylon's adjustment considered in decision making. Such changes were carefully considered to ensure that movement to reduce one effect does not lead to material change in other effects or to other receptors.

5.2.8 The total length of proposed underground cable has increased by around 1.3 km. An additional section of approximately 2 km of underground cable has also been considered for the Waveney Valley (the Waveney Valley Alternative), with a final decision subject to feedback and additional study findings.

5.3 Whole Route Feedback

5.3.1 Before the individual changes are described, this section provides a review of feedback received that related to the whole route.

Offshore or predominantly offshore connection

5.3.2 Various respondents stated or restated a preference for an entirely offshore or predominantly offshore connection alternative. A response to providing the connection offshore was published in the Strategic Options Backcheck and Review¹⁰ as part of the 2023 non-statutory consultation. A further review has been completed and set out in the

⁹ Pylon and gantry numbering is sequential from north to south with a two-letter prefix. The prefix is RG for the section from Norwich to Bramford, JC from Bramford to the EACN substation and TB from the EACN substation to Tilbury.

¹⁰ <https://www.nationalgrid.com/electricity-transmission/document/149281/download>

2024 Strategic Options Backcheck and Review published as part of the 2024 statutory consultation.

- 5.3.3 The 2024 SOBR and preceding sections of this document explain that there have been.
- no substantive relevant changes to policy to alter the interpretation of a presumption of the general acceptability of overhead lines in most onshore situations;
 - no substantive change in relative cost position between overhead line, underground cable or offshore HVDC to lead to a change in preferred solution;
 - no change in the need case, therefore the need for the reinforcements identified in the preceding studies remains; and
 - changes in legislation that have been taken into account in our back check of the proposals and our previous decision making on routeing, connection technology and mitigation.
- 5.3.4 As noted in Section 4 of this report the conclusions drawn continue to remain valid and appropriate and the preference for an onshore connection solution for the Project is unchanged.

Underground cable for the whole route

- 5.3.5 A number of respondents stated a preference for the use of underground cable for the whole route, though it is important to note that some also expressed a preference for the Project to avoid the use of underground cables.
- 5.3.6 NPS EN-5 paragraph 2.9.7 (as noted in Section 2 and Appendix A to this report), whilst acknowledging that there can be adverse effects, states that ‘the government does not believe that the development of overhead lines is incompatible in principle with applicants’ statutory duty under Schedule 9 to the Electricity Act 1989, to have regard to visual and landscape amenity and to reasonably mitigate possible impacts thereon, in practice new overhead lines can give rise to adverse landscape and visual impacts’.
- 5.3.7 It goes on ‘Although it is the government’s position that overhead lines should be the strong starting presumption for electricity networks developments in general, this presumption is reversed when proposed developments will cross part of a nationally designated landscape (i.e. National Park, The Broads, or Area of Outstanding Natural Beauty)’ (paragraph 2.9.20).
- 5.3.8 Paragraph 2.9.23 goes on ‘Additionally, cases will arise where – though no part of the proposed development crosses a designated landscape – a high potential for widespread and significant adverse landscape and/or visual impacts along certain sections of its route may result in recommendations to use undergrounding for relevant segments of the line or alternatively consideration of using a route including subsea cabling’.
- 5.3.9 Taking this policy context into consideration, and balancing several factors, National Grid is proposing the use of underground cable in the following locations:
- where the 2024 preferred draft alignment is routed through or is in very close proximity to the Dedham Vale Natural Landscape (an AONB) (where NPS EN-5 supports the use of underground cable); and
 - at the Waveney Valley Alternative, where National Grid is also gathering information and seeking feedback to inform decision making about the use of underground cable for the Waveney Valley crossing. This accords with NPS EN-5

paragraph 2.9.23 as we are considering the balance between additional environmental effects (in particular on ecology, archaeology, and peat soils) and additional costs with potential benefits (most notably, reduced landscape effects and reduced effects on the setting of a Grade I listed church).

- 5.3.10 Additionally, for technical reasons the use of underground cable is proposed:
- at the crossing of an existing 400 kV overhead line (to the north of Fairstead); and
 - for the complex crossings (including the proposed Lower Thames Crossing, existing electrified Rail line and for existing overhead line connections) required to achieve line entry to the existing Tilbury Substation.
- 5.3.11 Elsewhere the 2024 preferred draft alignment is outside designated areas (AONB etc) and, in the absence of other or additional factors and no new material considerations being identified, the use of an overhead line is considered to be consistent with national policy. The use of underground cable for the whole of the route therefore remains less preferred.

Close parallel of existing 400 kV overhead line

- 5.3.12 Several respondents also restated their preference for the Project to close parallel existing 400 kV overhead lines although no additional factors or new material considerations, beyond those already considered through the design development activities, were presented within feedback to support this preference.
- 5.3.13 National Grid recognises that close paralleling has the potential to reduce the level of effects that may arise from a new overhead line. For this Project, close paralleling, is considered to lead to greater effects for the reasons outlined below:
- the number of residential properties in close proximity to the existing 400 kV overhead lines - close paralleling would result in a number of properties having overhead lines close to both / multiple sides;
 - locations where the combination of existing physical and environmental features (railway and road infrastructure, commercial and residential property, woodlands, and orchards etc) present very substantial challenges to successful parallel routing; and
 - increased environmental effects where the overhead lines would have to converge and diverge.
- 5.3.14 Although there are some localised areas where close paralleling may appear beneficial, it remains National Grid's view that the introduction of a new overhead line, separated from existing 400 kV overhead lines, would overall be preferred.
- 5.3.15 The use of underground cable technology (with the additional CSE compounds) to cross existing overhead lines may be able to address constrained locations in isolation. However, the additional costs, along with the limitations on the ability to secure the necessary number of outages required for construction, mean that this would be less consistent with National Grid's duties and relevant policies.

Close paralleling other infrastructure (roads, rail, gas pipelines etc)

- 5.3.16 Feedback also noted a preference for new overhead line infrastructure to close parallel existing, or be constructed with, other existing or proposed infrastructure. The potential for reduced overall construction effects was cited on the basis that any disturbance from construction effects could be limited to the same corridor.

- 5.3.17 There could be potential benefits from infrastructure being concentrated, i.e., by routing the Project in close proximity to the other infrastructure. The benefits would however only arise if construction programmed closely align and work areas were separated sufficiently so that projects could progress without interference with each other. Constraints to routing such as residential properties, hamlets, villages, and towns located along, and in close proximity to, existing infrastructure are likely to prevent parallel routing and would likely result in a new overhead line requiring multiple changes in direction to remain broadly parallel. The combination of existing physical and environmental features (such as railway and road infrastructure, commercial and residential properties, woodlands, and orchards) present very substantial challenges to routing.
- 5.3.18 Overall, therefore it is considered that close paralleling existing, new, or proposed infrastructure should be considered on a case-by-case basis. Although in some circumstances the nature of the infrastructure may create a routing opportunity, more typically close paralleling would not be certain to reduce environmental effects, improve compliance with the Holford Rules or be more consistent with the requirement to be economic and efficient.
- 5.3.19 Specific feedback referenced the A12 and a new Anglian Water supply pipeline. National Grid does not consider that close paralleling the new Anglian Water pipeline (proposed in the vicinity of the AONB) nor the A12 works offer any advantages. These other elements of infrastructure have different start and finish points to the Project therefore limiting the area over which the potential for benefits may be available. In areas of proximity and thus potential benefit, the available space for the routing of a 400 kV connection, in both these cases, is constrained by the presence of residential properties, physical constraints, and environmental features. The result of which would be additional direction changes and / or greater environmental effects. The less optimised routing to connect with the limited areas of potential paralleling for these options is therefore considered to be less preferred than an optimised and more direct 400 kV connection.
- 5.3.20 The different timings of projects and construction requirements further limits the potential for shared temporary construction infrastructure which would potentially reduce effects. For example, the Anglian Water pipeline is expected to be installed and land restored towards the end of 2024, which is before an application for the Project will be made.
- 5.3.21 Elsewhere, there is a preference for a change to closely follow an existing gas pipeline through and in the vicinity of the Dunton Hills Garden Village proposals. In this case the presence of the gas pipeline creates a corridor free from built development, due to established safety requirements. The extent of such zones varies with the pressure and pipe diameter but is typically in the order of 80 m for high pressure transmission infrastructure such as that near Dunton Hills Garden Village. This safety zone creates an opportunity for the route of an overhead line, noting that such routing needs to be carefully balanced against other effects that may occur for example to ecological or residential receptors etc. The specific balance in this area is discussed further in paragraphs from 5.4.211. These paragraphs set out how the decision has been made to follow the gas pipeline in the vicinity of Dunton Hills Garden Village area whereas the same gas pipeline cannot be followed further to the north in the vicinity of Herongate Woodland Cemetery.

Coastal Corridors

- 5.3.22 A number of respondents reiterated their preference that routes closer to the coast should be taken forward for the Project because they considered this would be less impactful on residential properties (both existing and proposed). Although this may be the

case in particular locations, as set out in the CPRSS, options closer to the coast (passing to the south-east of Colchester and Chelmsford) would have increased effects on the qualifying features associated with European designated sites (which collectively have also been proposed to be put forward as a World Heritage Site (the East Atlantic Flyway see Section 4.3 of the 2023 Design Development Report)). The SAC and SPA coincide with sites also designated variously as Ramsar, SSSI and National Nature Reserves. As no new material considerations or additional factors have been identified, these options continue to be less preferred, due to the potential impacts on the European designated sites, and they have therefore not been progressed. The 2024 preferred draft alignment (building on the 2022 consultation corridor and 2023 preferred draft alignment) provides an alternative without such effects.

5.4 Location Specific Feedback

- 5.4.1 This section describes the more substantive changes made to the 2023 preferred draft alignment in response to feedback, site surveys and preliminary assessment findings. It also explains why other proposed changes raised through feedback are considered less preferred and have not been taken forward. The 2023 Non-Statutory Consultation Feedback Report provides further details on all the proposed changes (both those accepted as well as those not taken forward).
- 5.4.2 In some locations the pylon numbers change between 2023 and 2024 draft alignments with the text stating which alignment it refers to. Where no alignment year is stated then the numbering has not changed between the 2023 and 2024 draft alignments. Figures are included in the following section to support understanding of the text and to illustrate the more complex changes from the 2023 preferred draft alignment (brown alignment and pylon positions) to the 2024 preferred draft alignment (blue alignment and pylon positions). The 2022 consultation corridor is also included on the figures and shown along with statutory designations. Other consultation materials cover the whole of the 2024 preferred draft alignment and show draft order limits (the area within which temporary works and permanent assets will be sited and where activities to construct the Project will occur) and other detail including environmental constraints.
- 5.4.3 In several cases respondents repeated previous requests for a change but provided no additional evidence, to support their stated preference for the alternative. All such requests were considered, and previous decision making was reviewed in the light of additional survey findings and baseline studies.

Interface with third party activities

- 5.4.4 Proposed built development (i.e. proposals for new development such as new housing, warehouses, and certain changes of land use) that has some status in the planning system has been considered. In order to inform design responses a 'cut-off date' of 31st December 2023 has been applied. Any subsequent publication of further development proposals will be considered through the Statutory Consultation response process. The status of those considered includes:
- sites being identified within the local development plan (or advised to us directly by Local Planning Authorities as a site of future development);
 - sites identified within Regulation 18 / 19 proposals of the Local Plan/ Minerals Plan making process. Some down selection of sites must have been undertaken and a preferred site / sites have been identified or there is a strongly implied

likelihood of the site progressing to allocation in the near future given the absence of key constraints;

- having been the subject of a request for, or received, an EIA screening or scoping opinion; or
- being the subject of a submitted planning application.

- 5.4.5 Proposed development sites at earlier ‘call for sites’ stages have not been considered given the high proportion of such sites that are put forward, but which often do not progress. Feedback from individual landowners relating to future development aspirations / plans but without the evidence of planning status as set out above has also not been considered at this stage. This is however a constantly evolving list of proposed developments. We will continue to monitor and backcheck emerging developments against our proposals through to submission of the application.
- 5.4.6 Proposed developments (within the criteria set out above) have been considered on a case-by-case basis, balancing consistency with the Holford Rules against potential direct and indirect effects on the Project. The potential ‘to avoid’ has been balanced against less consistency with the Holford Rules (i.e. a less direct route with more angle changes to route around a development) with the potential to reduce direct (e.g. loss of developable land) and indirect (e.g. commercial return) effects.
- 5.4.7 The ability to route across, through or between development proposals (to achieve more direct alignments more consistent with the Holford Rules) has also been considered and balanced against the potential effects on the proposed development. There are a number of locations, for example, where the arrangement of panels within solar farms is such that generation panels could be oversailed (i.e. not directly impacting the number of panels) resulting in a more direct alignment, has been balanced against the limited impact from construction or operation.
- 5.4.8 Similarly, development proposals may be constrained by existing on-site features which may create a corridor opportunity for new transmission infrastructure. As set out previously, gas pipelines, for example, have associated safety corridors which restrict built development, but which can potentially provide space for new connection infrastructure. In the vicinity of the Dunton Hills Garden Village proposals the 2023 preferred draft alignment has been amended to take forward a preference to follow the gas pipeline corridor for a greater distance (this is included in the 2024 preferred draft alignment).
- 5.4.9 National Grid has appointed an independent aviation consultancy to assist with the consideration of potential interactions with flying activities. Aviation interests identified have included a variety of aircraft types, hot air ballooning, military, civilian and emergency services helicopters, as well as model aircraft. Following engagement, and in response to feedback and further assessment, changes have been made to the 2023 preferred draft alignment.
- 5.4.10 The 2024 preferred draft alignment has been developed so that flight activities at all identified airstrips (where flight activity is confirmed) can continue to operate, with one exception. At Chase Farm airstrip the 2024 preferred draft alignment cannot be located at sufficient distance from the airstrip to achieve the required clearance from the overhead line. National Grid will continue to engage with the operator of Chase Farm airstrip to establish the appropriate response. We will also continue to engage with the other airfields as appropriate throughout the Project’s continuing development.

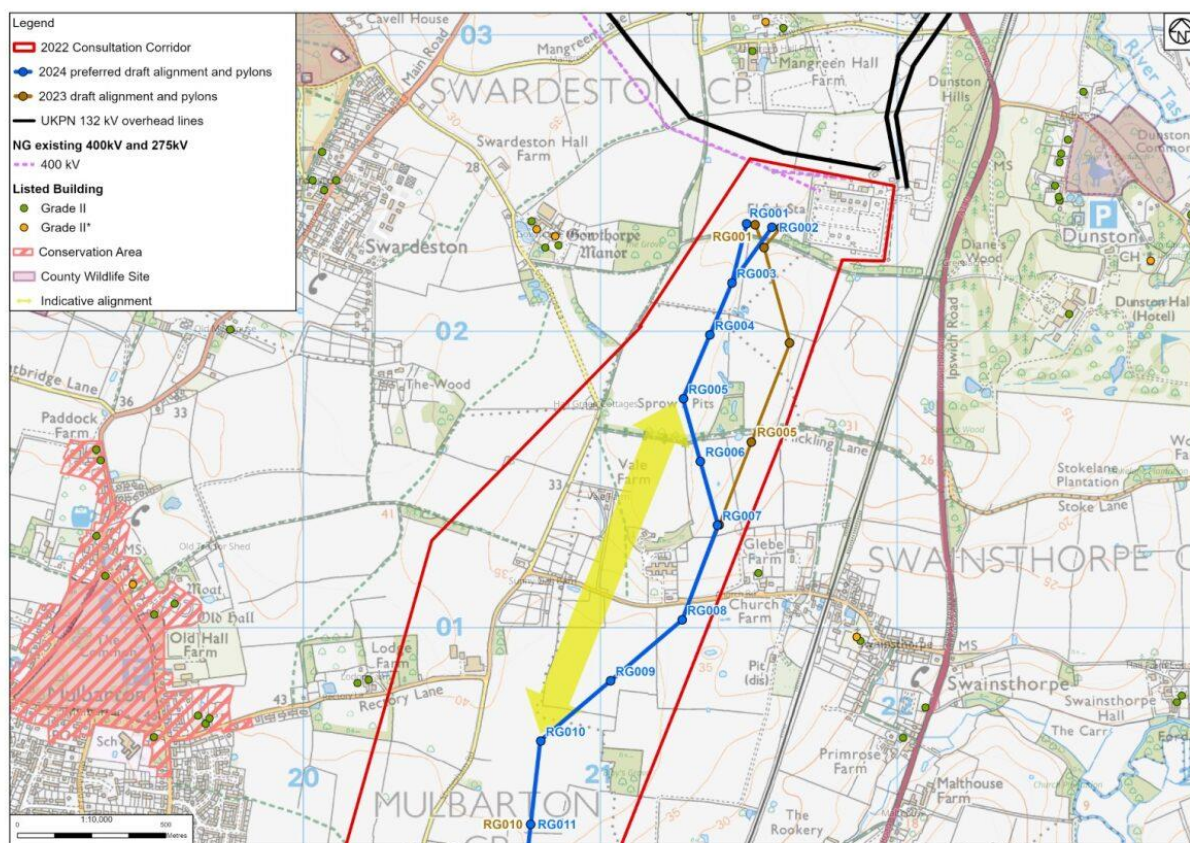
- 5.4.11 In some locations the 400 kV infrastructure crosses or follows the alignment of existing UKPN owned/operated 132 kV overhead lines (on lattice pylons). We are proposing the replacement of sections of 132 kV overhead line with 132 kV underground cables with final details subject to detailed design and agreement with UKPN.
- 5.4.12 Additionally, in response to feedback and as a result of assessment, a number of further areas have been identified where replacement of 132 kV overhead lines (on lattice pylon) with underground cable is proposed as mitigation for effects that would otherwise arise. In all cases these are extensions to the underground cable already required for crossings. We will continue to consider whether this may also be appropriate in other locations, and subject to agreement with UKPN.

Norwich Main Substation to Tas Valley – Section A

- 5.4.13 This is within Section A which extends from Norwich Main Substation to the River Waveney. Proposals for a battery storage facility have come forward on the south side of Norwich Main Substation which overlap with the 2023 preferred draft alignment in respect of the positioning of pylon RG004 and the span through to RG005 which are close to the existing overhead line (see Figure 5.1).
- 5.4.14 Consideration was given to repositioning the 2023 preferred draft alignment or influencing the potential layout of the battery storage should it be progressed. It was concluded that on balance, despite the introduction of an additional pylon, there would be overall lower effects due to better screening of the more extensive ground level battery infrastructure by Sprow's Pits Woodland if the proposed 400 kV overhead line was realigned. Pylons RG001 to RG007 (RG1 to RG6 in the 2023 preferred draft alignment) are now positioned to the west of Sprow's Pits Woodland.
- 5.4.15 The draft Order Limits¹¹ to the east allow for the 2023 preferred draft alignment to be taken forward, should for whatever reason the battery storage proposals not proceed, as this would be preferred in the absence of that development.
- 5.4.16 An alternative straight alignment (between pylons RG005 to RG010 on the 2024 preferred draft alignment) which would have positioned the alignment to the west of The Vale was less preferred. Whilst noting this would reduce the number of angle pylons and in some respects be more consistent with the Holford Rules, it would have resulted in a large number of residential properties (houses and apartments) being positioned closely between overhead lines to east and west, increasing effects on residential amenity and thus being less consistent with supplementary notes to the Holford Rules. It was considered that effects would be reduced by the 2024 preferred draft alignment passing to the same side as the existing overhead line.

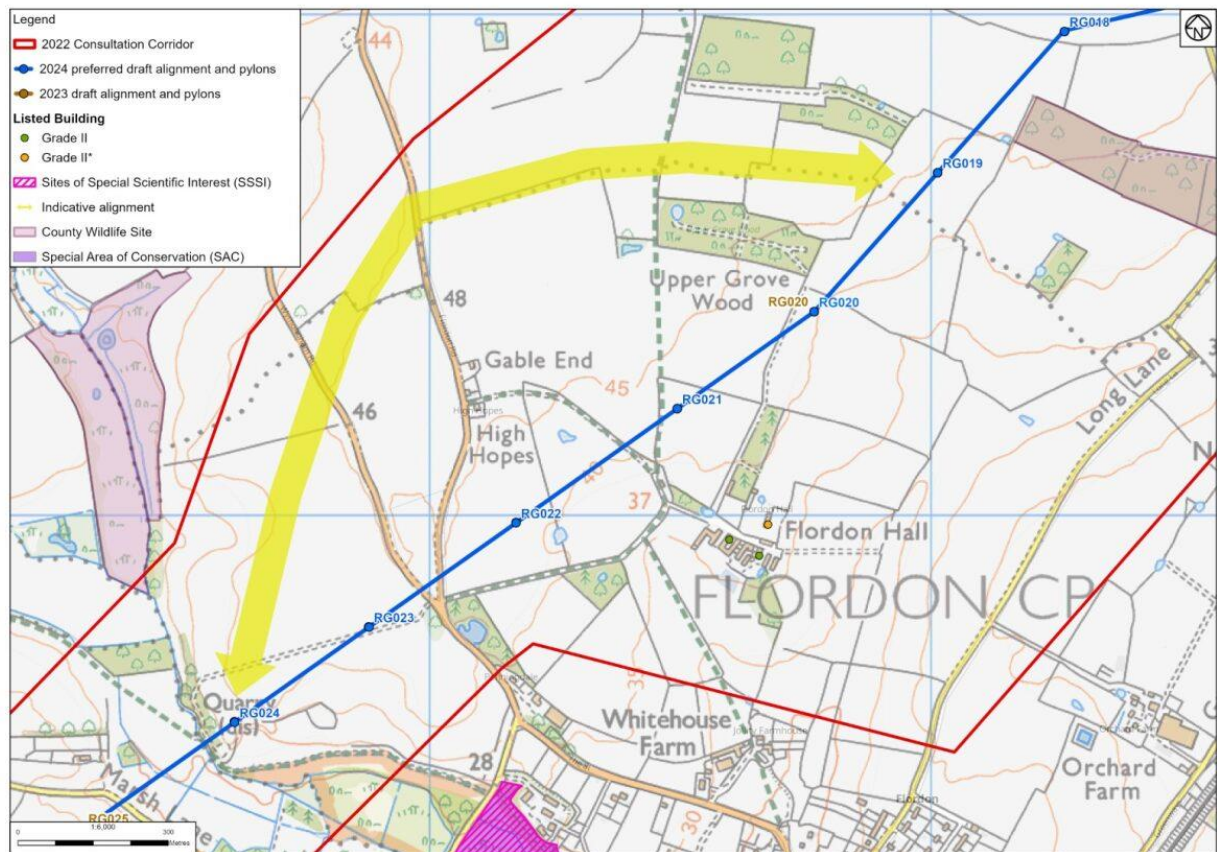
¹¹ The draft Order Limits define the boundary of the area over which National Grid will seek permanent and temporary rights to undertake the necessary construction works and to deliver the Project

Figure 5.1 Alignment south of Norwich Main Substation



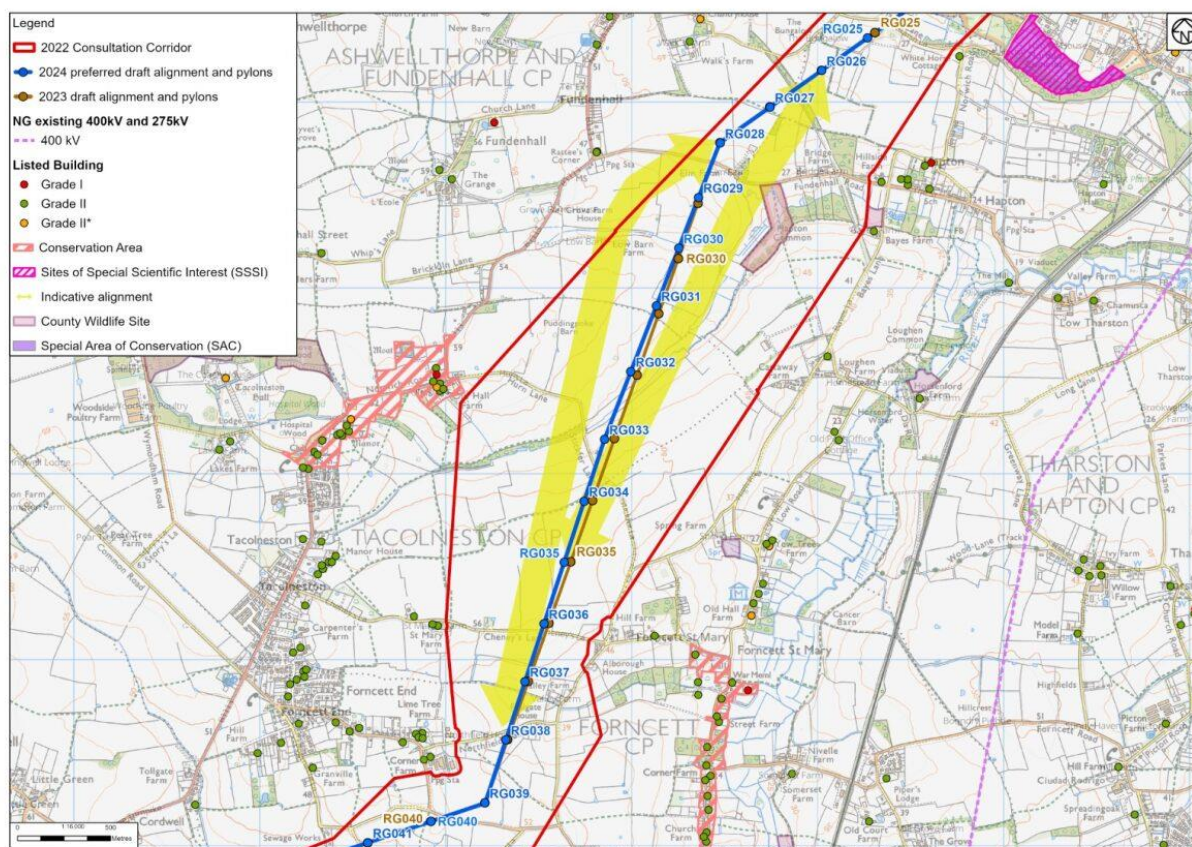
- 5.4.17 A minor realignment is being taken forward between RG013 to RG017 (referred to as RG12 to RG17 on the 2023 preferred draft alignment). This is in response to the repositioning of RG013 slightly northwards due to the presence of buried archaeological features (identified by surveys for the Bloys Solar Farm), and a consequent realignment of the route to the south, balancing the preference to avoid introducing an additional angle pylon but retaining the position of RG14 to minimise interaction with an existing solar farm.
- 5.4.18 Feedback requested moving the route further to the west of Flordon Hall (see Figure 5.2). This would be from around RG019, heading west between blocks of woodland and passing to the west of residential properties at and close to Gable End, before reconnecting in the vicinity of RG024.
- 5.4.19 Whilst this would potentially reduce effects on views from the east of the Grade II* Listed Flordon Hall it would require a longer route, three additional angle pylons and potentially an additional pylon compared with an otherwise substantially straight alignment. It would also partially transfer environmental effects to the Grade II* Listed Mergate Hall and position more pylons in closer views of several homes on Flordon Road. On balance, given the less direct and longer route, and the relative effects of the alternative to other similar receptors, no change is currently proposed, and the preferred alignment is the same as in 2023.

Figure 5.2 Alignment at Flordon



- 5.4.20 A slight realignment to the west has been made between RG028 to RG039 (see Figure 5.3) to respond to landowner feedback to position pylons to field boundaries, and to increase separation to South Norfolk Model Flying Club. The feedback requested moving pylons RG028 / RG029 to the west, together with a straight realignment to the south towards RG038. This change would move RG037 much closer to a property where the 2023 preferred draft alignment was approximately midway between it and a property to the east. At this location the nearest pylon to one of the properties also benefits from being positioned behind existing trees to provide some screening.
- 5.4.21 Seeking to meet request for a separation from the model flying site in excess of 300 m by a more localised route, would not be possible without introduction of at least two additional angle pylons (to the south of RG033), and / or potentially increasing the extent of woodland clearance, or materially reducing the separation to residential properties either side of the alignment. The slight realignment proposed with the 2024 preferred draft alignment has increased the separation to the model flying club to around 200 m. National Grid will continue to engage with the model flying club to consider opportunities to further reduce effects but considers this separation will not restrict model flying.
- 5.4.22 Other landowner feedback in this area suggested straightening the 2023 preferred draft alignment between RG024 and RG032 to use a shallow valley to the east. Whilst this would slightly lower the position of the pylons in accordance with some of the Holford Rules, it would reduce consistency with other Rules. It would also, increase effects on residential amenity by passing closer to a greater number of properties, and would lead to some ecological effects on Hapton Common County Wildlife Site (CWS) (as vegetation management would be likely to be required). As such this was less preferred and not taken forward.

Figure 5.3 Alignment at Tacolneston



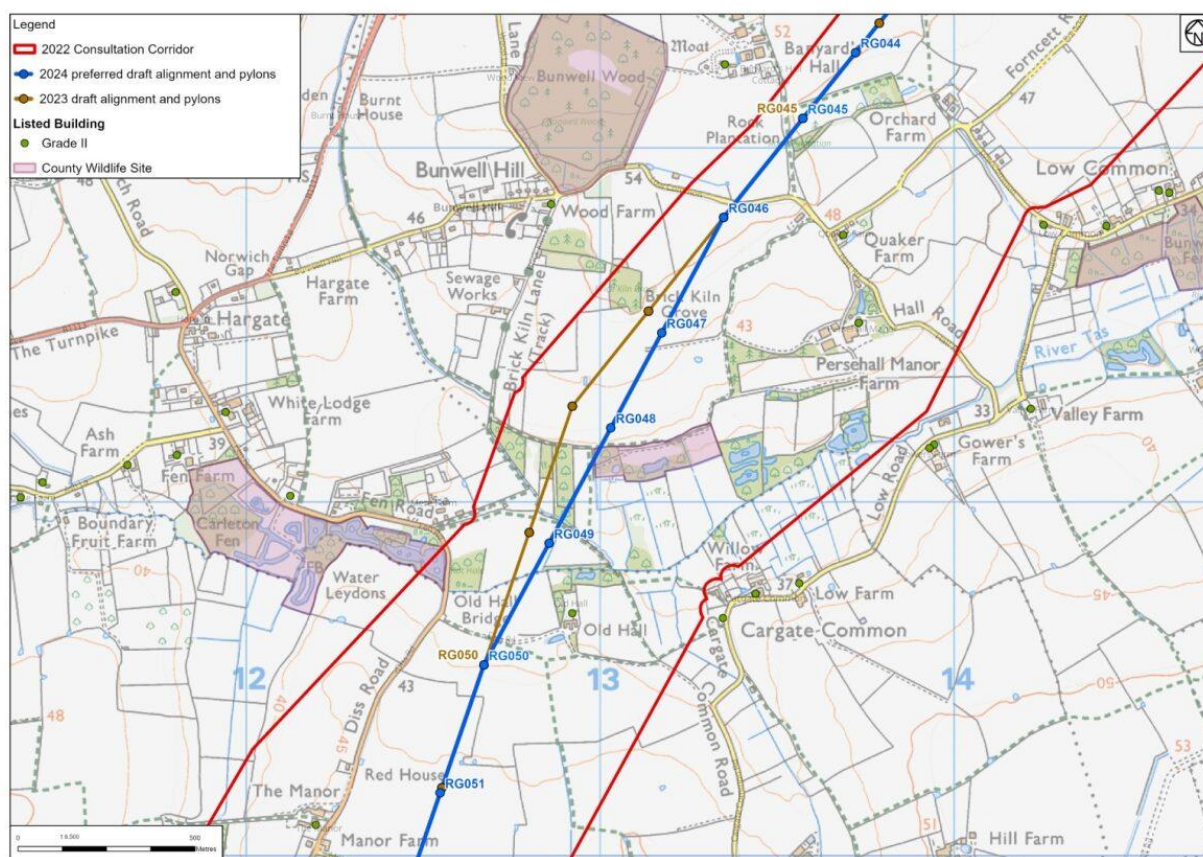
- 5.4.23 In response to feedback, the positions of pylons RG043 and RG044 have been modified to increase the extent to which they are at least partially filtered by existing vegetation in residential views from properties to the south (at around 250 m distance). Whilst this change does move pylon RG044 closer to other residential properties to the west (but at a similar distance) the pylon is now not considered to be in main views (though depending on exact viewing location on a property curtilage may be to the side of views or benefit from some screening). Other alternatives suggested to remove the pylons from the view of the property to the south, such as a change of the alignment to pass further north and to the west of Banyard's Hall. This change has been considered but effects would be transferred to a greater number of properties at Cordwell, increased for the residential properties at Banyard's Hall (grade II listed) and there would be increased effects on woodland. The route of the 2023 preferred draft alignment has therefore been retained but individual pylon positions have been modified.

Tas Valley crossing to North of Diss - Section A

- 5.4.24 This is within Section A which extends from Norwich Main substation to the River Waveney.
- 5.4.25 Feedback proposed moving the 2023 preferred draft alignment further to the west to reduce effects on Priory and Tibenham airfields. This has been reviewed, as set out in paragraphs 5.4.9 and 5.4.10 above, and it is considered that flight activities will be able to continue at both these airstrips.
- 5.4.26 The orientation of Priory Airfield parallel to the 2023 preferred draft alignment means aircraft can achieve necessary clearance. At around 2 km from the Project, flying activities at Tibenham Airfield are not considered to be affected. National Grid will however continue to engage with the relevant operators.

- 5.4.27 Other feedback in this location suggested alternative alignments should be adopted to the east between RG046 and RG050 (see Figure 5.4) to reduce effects on an area of woodland. An alternative, to divert directly south from the east of RG048 before a right angle turn to reconnect around RG050, was not taken forward due to the greater angle of direction change and potentially increased effects on the residential amenity, and heritage effects at Old Hall. This was change was also considered to be less consistent with the Holford Rules.
- 5.4.28 The 2024 preferred draft alignment does however include a realignment between RG046 and RG050 which was raised as a further alternative. This replaces a single larger direction change at RG048 with two smaller direction changes at RG046 and RG050. Both the 2023 preferred draft alignment and 2024 preferred draft alignment would affect existing woodland. Although the 2024 preferred draft alignment would oversail the western end of the Brick Kiln Lane Bunwell Hill County Wildlife Site (CWS) on balance ecology effects are considered lower on this alternative than on the 2023 preferred draft alignment and would not be offset by slightly closer routeing (reducing from just over 250 m to just under 250 m) to the Grade II listed heritage asset at Old Hall which benefits from some screening and filtering by existing vegetation.

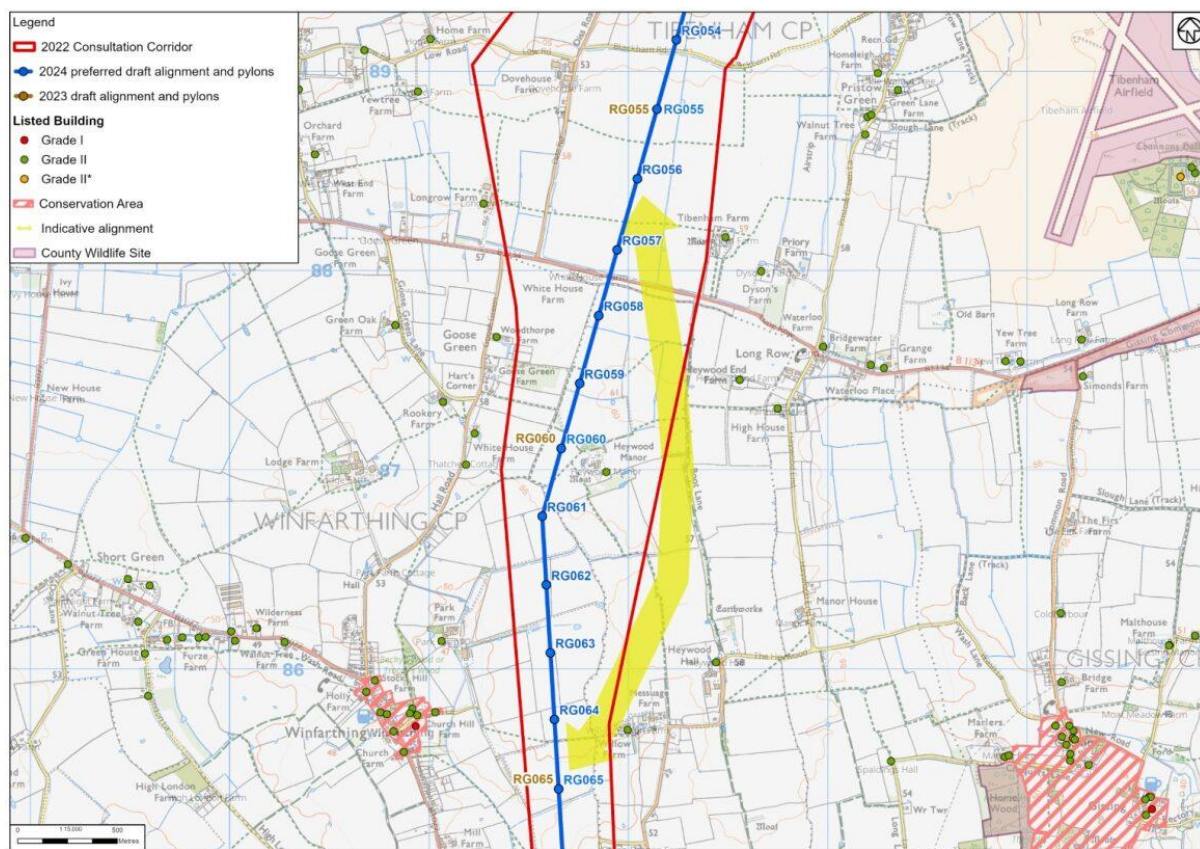
Figure 5.4 Alignment at Cargate Common



- 5.4.29 Feedback to position the alignment to the east of Heywood Manor to reduce effects on visual amenity to residents and businesses to the west of RG59 to RG61 has been considered (see Figure 5.5). There is around a 400 m separation between the properties and the 2023 preferred draft alignment. This potential change, without adding undue diversions, would introduce two additional angle pylons and move the alignment closer to properties to the east of Heywood Manor reducing separation to between 250 m and 350 m thus increasing effects on residential amenity. It would also position the overhead

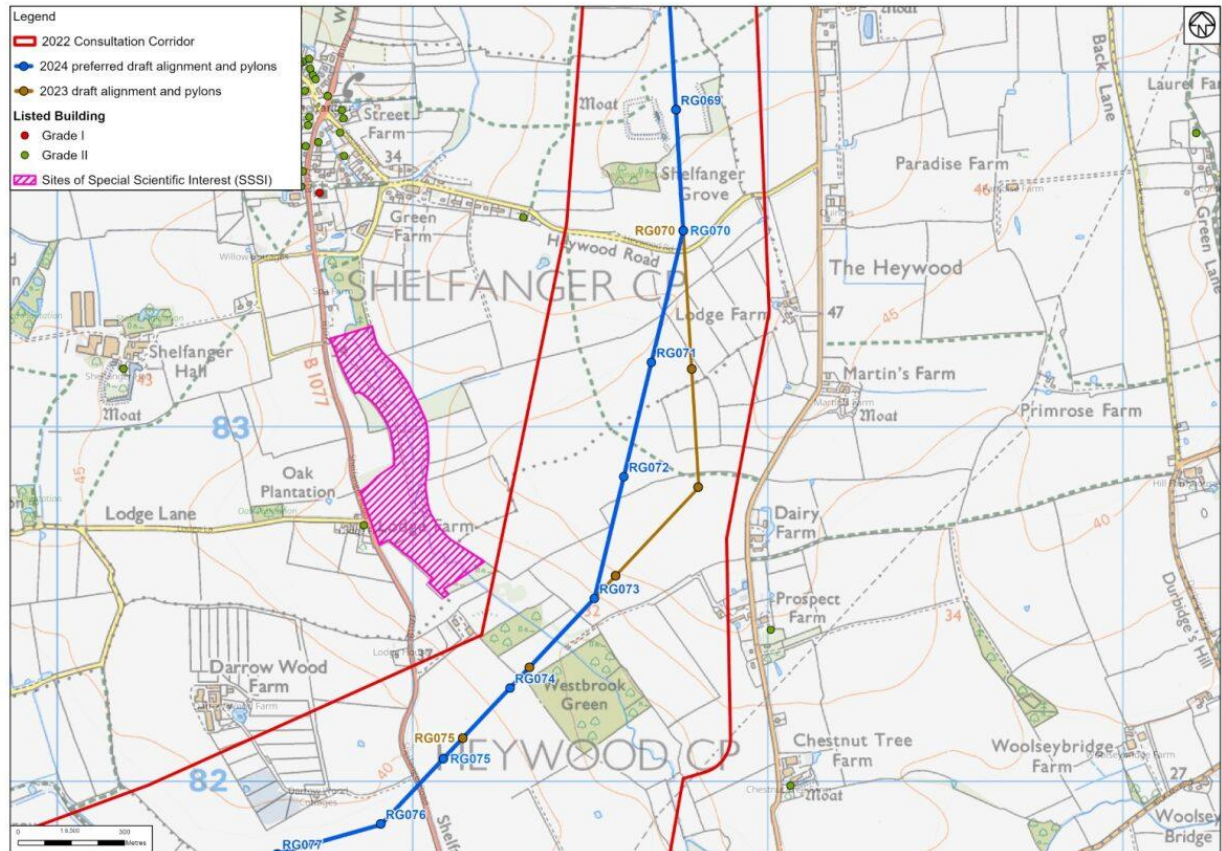
line closer to the southern end of Priory Airfield and likely to restrict flight activity. This alternative is therefore less preferred and has not been taken forward.

Figure 5.5 Alignment at Winfarthing



5.4.30 In response to feedback, a small adjustment to the 2023 preferred draft alignment between RG070 and RG073 has been taken forward (see Figure 5.6). Feedback had requested a diversion from RG069, but this has not been taken forward as it would have increased woodland loss (less consistent with the Holford Rules) and increased heritage effects due to oversailing a moat. The change can be made from RG070, requiring one angle pylon with a larger direction change to be replaced with two pylons each with a relatively smaller angle change. This reduces effects on residential amenity by increasing separation between the alignment and a number of homes to the east (including Lodge Farm and Dairy Farm) with the separation from the closest property increasing from around 150 m to around 300 m. For properties to the west, there is a slight reduction in separation, but this remains in excess of 400 m from the closest property. This change also allows for the adjustment of the position of RG074, moving it out of an ecologically more valuable river valley (from a field around 300 m from Shelfanger Meadows, just upstream in the valley) into an arable field.

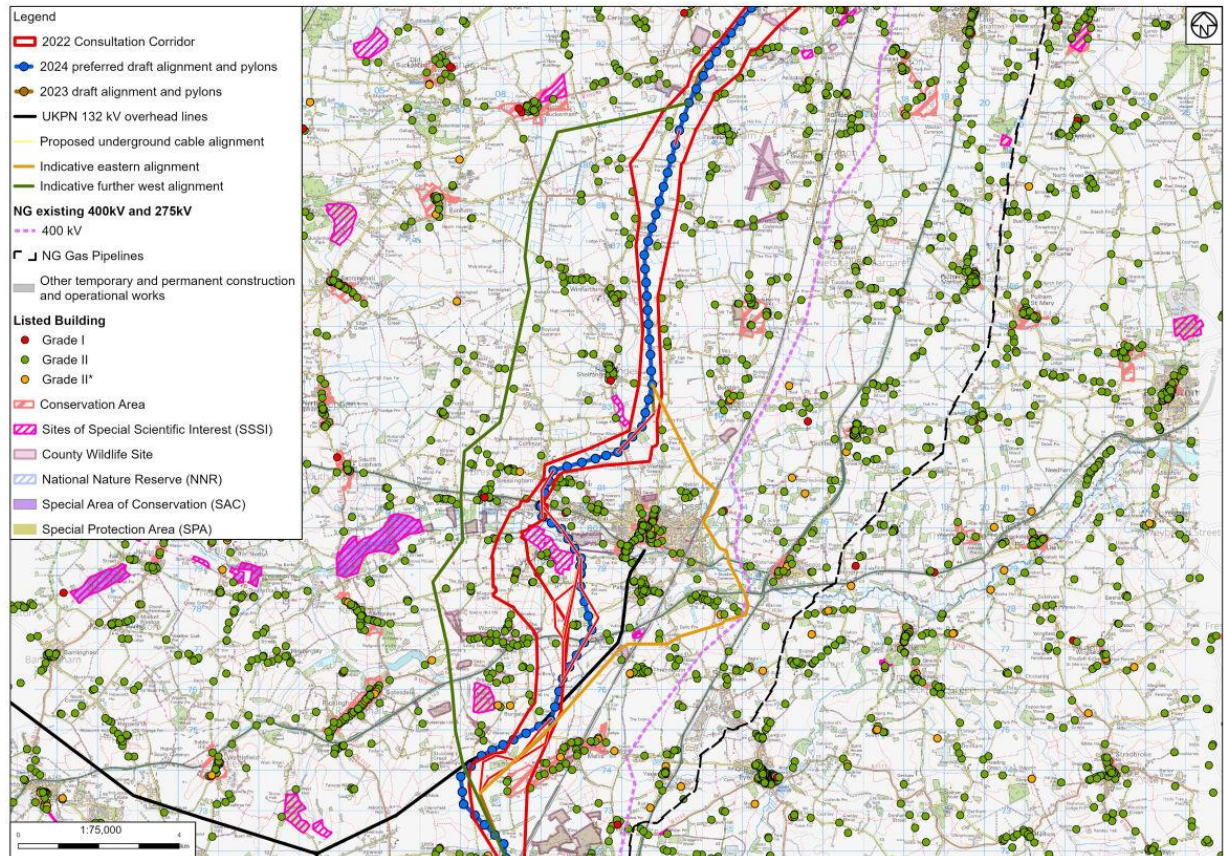
Figure 5.6 Alignment at Shelfanger



Diss and the Waveney Valley (including the Waveney Valley Alternative – Section A and Section B

- 5.4.31 The River Waveney forms the boundary between sections with section A to the north and section B to the south. Potential alternative alignments to pass further to the west of Diss, than the 2023 preferred draft alignment, as well as potential alternative alignments to pass to the east of Diss have been backchecked in response to restated preferences in feedback responses (see Figure 5.7).
- 5.4.32 Alternatives for overhead line only and overhead line with underground cable have been considered. For the option further west this was considered on the basis of a specific alignment that had been proposed but noting that this proposed route, which in some cases was close to residential properties, was refined by applying the same routeing approach adopted for the 2023 preferred draft alignment.
- 5.4.33 Alternatives further west as overhead line only are overall considered less preferred because they would lead to greater effects. For an overhead only alternative. A Grade I Listed Church (Church of St John the Baptist at Bressingham) would be passed at similar ground level around 550 m to the west (the 2023 preferred draft alignment passes a Grade I listed church on lower ground at around 400 m distance). Ecological effects are considered to be greater than for the 2023 preferred draft alignment due to closer proximity (approximately 1 km compared with approximately 3 km for the 2023 preferred draft alignment) to Redgrave and Lopham Fens (SSSI, Ramsar, National Nature Reserve, Special Area of Conservation). It would also route is through an area more central to nature recovery proposals that are being progressed.

Figure 5.7 Alignment at Diss



- 5.4.34 Alternatives further west would also lead to greater effects on peaty soils which are more extensive to the west when compared with the area crossed by the 2023 preferred draft alignment.
- 5.4.35 Whilst there is no prescribed guidance on the proximity of overhead lines to residential property, the effects on residential amenity are considered overall to be slightly reduced on the further west alternatives. When compared with the 2023 preferred draft alignment there are slightly fewer residential properties within 200 m than are within the same distance of the 2023 preferred draft alignment (estimated at 18 compared with 25). There are however a greater number of clusters of residential properties from the 2023 preferred draft alignment (such as at Bressingham) than are present within a similar distance from alternative further west.
- 5.4.36 With effects reduced through filtering by existing vegetation and separations between residential property and the Project at distances greater than 200 m (e.g. 300 m at the northern and less screened properties at Bressingham Common) these potential effects on residential properties are not considered to outweigh the ecological concerns and potential effects on peaty soils on the alternatives further west.
- 5.4.37 An alternative further west including with a section of overhead line crossing the Waveney Valley being replaced by the use of underground cable was also considered. A slightly longer length of underground cable, compared with the Waveney Valley Alternative, would be necessary to position CSE compounds outside Flood Zones. Overall, this alternative is considered to be less preferred principally because of greater effects on ecological interests and peat. These effects arise because additional information indicates the area comprises a layer of peat/peaty soils over gravel which

presents limitations to the extent to which trenchless technology¹² can be used. This requires the use of open cut trenching over a distance around twice that of the Waveney Valley Alternative. There are also additional challenges to underground cable construction from relatively more extensive areas of woodland and the presence of a number of waterbodies making this alternative less preferred.

- 5.4.38 Alternatives to the east of Diss (whether as overhead line only or overhead line with underground cable) were also considered. Both these alternatives would offer better access for construction traffic compared with either the 2023 preferred draft alignment or the further west alternative, both of which require Heavy Goods Vehicles (HGV) movements through Diss on the A1066.
- 5.4.39 An overhead line only alternative to the east of Diss is not preferred to the 2023 preferred draft alignment. A route to the east of Diss would have the potential for effects on the Grade I Listed St Andrews Church at Frenze necessitating an alignment to the west of the church. Overall, this is also a longer route than alternatives to the west of the town. The routing would also lead to effects on residential amenity to two to three times more properties compared with alternatives to the west of Diss. It also unavoidably positions several properties between overhead lines (close to both sides) at locations near Diss Business Centre and to the south of the A1066. A route across Stuston Common Golf Course would need to be identified with the potential for construction works to restrict activity over several parts of the course for extended periods. Additionally, the proximity of the existing 400 kV overhead line and residential properties (Stuston Hall and Lily Farm, both also Grade II listed buildings) to the south of the A143, means either around a 2 km section of underground cable between CSE compounds, to cross under and then back under the existing overhead line, or repositioning of the existing overhead line to the east to create additional space for the Project would be required. Given the increased effects on residential amenity, potential effects on the golf course, and the technical complexity, additional cost, and necessary outages to pass the existing overhead line, an overhead line alternative to the east of Diss is less preferred to the 2023 preferred draft alignment.
- 5.4.40 An alternative to the east of Diss (as overhead line with underground cable) has also been considered and is not preferred. Although many of the effects would be the same as for the overhead line only alternative to the east set out above, additional effects would also be expected.
- 5.4.41 The same ground conditions (peat over gravel) are expected in the vicinity of the river with similar restrictions on trenchless crossing length as noted above. As well as the effects arising from open trenching through peat, it is also expected to be more disruptive for a longer period to the activities of Stuston Common Golf Course. In addition, the underground cable length required to the east would be around 25% greater (from north of the A1066 to south of Stuston House) and there would be conflict with the need to safeguard Common Land given routing through Common Land.
- 5.4.42 Feedback has also suggested a preference for reverting to an alignment within the 2022 consultation corridor, either as an overhead line only alternative or as overhead line with underground cable alternative. Respondents commented that effects on businesses

¹² Open cut trenches are the standard underground cable technique but can be replaced by the use of trenchless techniques (such as Horizontal Directional Drilling) to avoid or reduce effects on surface features. Factors such as topography, soil characteristics and other constraints influence the distance over which such techniques can be deployed.

should be given less weight than residents views. No additional factors or new material considerations were identified by feedback over and above respondent preference.

- 5.4.43 Route length for an alternative within the 2022 consultation corridor is expected to be comparable to that for the 2023 preferred draft alignment. We have back checked the previous decisions informed by new information and the updated planning policy position. It has been concluded that adopting an overhead line only alignment within the 2022 consultation corridor would reintroduce the effects identified previously, and that these continue to be of sufficient level to continue with the 2023 preferred draft alignment. These effects would be on the Grade I Listed St Mary's Church at Wortham, passed on higher ground, compared with the 2023 draft preferred alignment passing St Remegius on lower ground. It would reintroduce the likely oversail of parts of the Bressingham Steam Museum and Gardens (an important local socio-economic site), would oversail a recently consented care and well-being business and would increase the removal and thus effects on non-designated woodland. It would either require a less direct route with greater angles to avoid Brook Farm Airstrip or be likely to lead to closure of the airstrip due to the overhead line being unavoidably close with insufficient clearance for aircraft. For these reasons National Grid does not consider it appropriate to adopt an alignment within the 2022 consultation corridor.
- 5.4.44 Whilst some of these effects may be addressed by the inclusion of a section of underground cable this would be much longer than proposed for the Waveney Valley Alternative. This is because unlike the 2023 preferred draft alignment, where the church (in the 2023 alignment it is St Remegius) overlooks the valley, with the 2022 consultation corridor the church (in the 2022 corridor it is St Mary's) is located away from the valley. As a result, it would be expected to require a longer length of cable to address both concerns. It would also lead to greater loss of woodland in light of the restrictions on trenchless crossing distances noted above. Other effects such as on Brook Farm Airstrip would remain, as a reversion to overhead line would occur to the north of the airstrip. Reducing effects, as noted above, would require either a less direct route with greater angles to avoid Brook Farm Airstrip or be likely to lead to closure of the airstrip due to the overhead line being unavoidably close with insufficient clearance for aircraft. For these reasons it is not considered appropriate to adopt an alignment including some underground cables within the 2022 consultation corridor.
- 5.4.45 In summary National Grid considers that the 2023 preferred draft alignment is still preferred over other alternatives raised in feedback. It has therefore been taken forward as the baseline position for the 2024 preferred draft alignment.
- 5.4.46 Feedback to utilise underground cable as an alternative for part of the 2023 preferred draft alignment is considered in the section below.

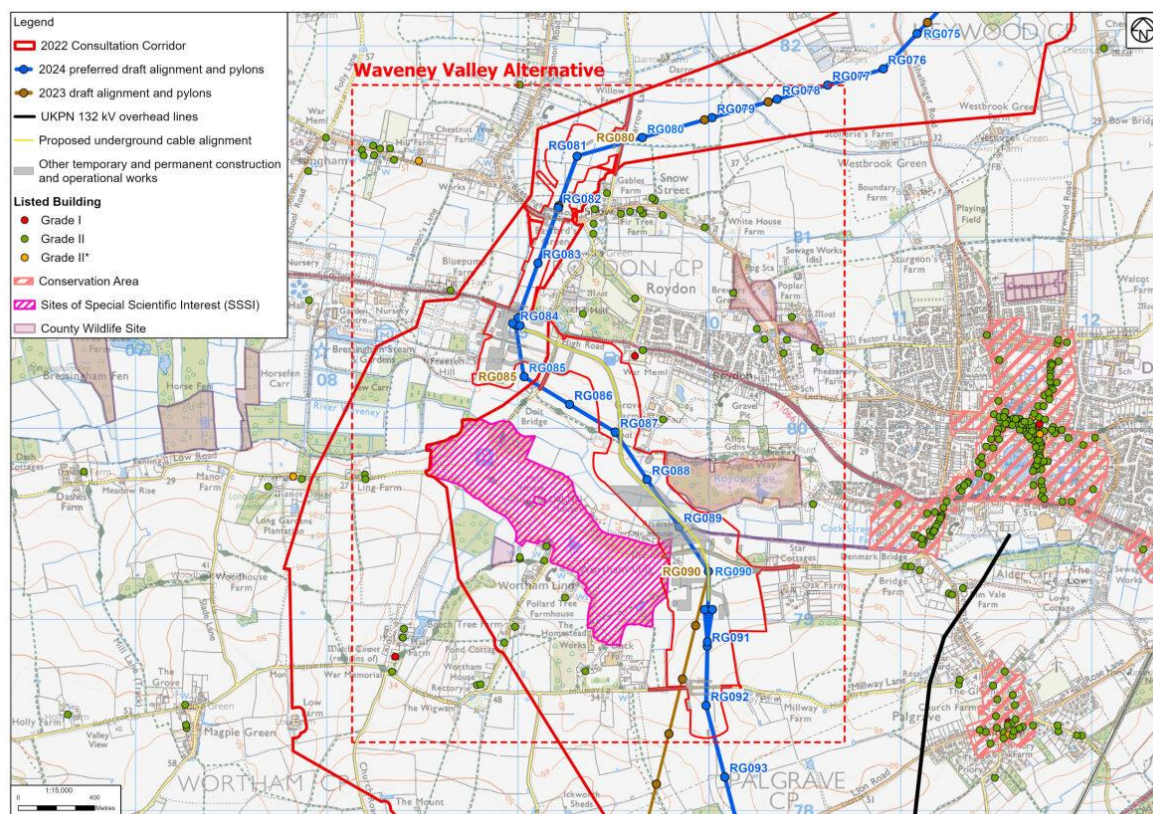
Waveney Valley Alternative

- 5.4.47 National Grid develops its projects on the basis that as established by NPS EN-5 (paragraph 2.9.7) "it is the government's position that overhead lines should be the strong starting presumption for electricity networks developments in general..."
- 5.4.48 National Grid then follows the policy guidance as set out further on paragraph 2.9.20 "...this presumption is reversed when proposed developments will cross part of a nationally designated landscape".
- 5.4.49 Further consideration is then given to other specific locations where, in line with policy set out in NPS EN-5 paragraph 2.9.23 "cases will arise – though no part of the proposed development crosses a designated landscape – a high potential for widespread adverse

landscape and/or visual impacts along certain sections of its route may result in recommendations to use undergrounding for relevant segments of the line...”

- 5.4.50 National Grid has considered this policy guidance and whether there are locations where the combination of circumstances presented by potential effects (including on landscape, heritage and recreational amenity) justify the additional costs and effects that would arise from the use of underground cables (NPS EN-5 2023 para 2.9.25 set out in the Secretary of State decision making considerations.). We have identified the crossing of the Waveney Valley as a specific location where the combination of effects may arise subject to the potential effects on ecology and soils.
- 5.4.51 Whilst the Waveney Valley is not a nationally designated landscape as set out in NPS EN-5 paragraph 2.9.20, the area was formerly identified (in the local plan) as a Special Landscape Area. Effects would arise from new infrastructure in the landscape. In addition, the setting of a Grade I listed building (St Remegius Church) extends from the edge of Roydon across the valley to the agricultural hinterland and would be affected by a new overhead line. There would also be effects on an undesignated moat. The valley, including the adjacent SSSI are used extensively for recreation with a long-distance path the Angles Way (established by the Ramblers Association), crossed by the 2023 preferred draft alignment adjacent to RG087.
- 5.4.52 In considering whether the threshold implied by paragraph 2.9.23 is met, National Grid has developed a proposed arrangement, referred to as the Waveney Valley Alternative, for a connection incorporating some underground cable (see Figure 5.8). This shows both the alignment and pylon positions if progressed as overhead line along with the route of the underground cable in the Waveney Valley Alternative arrangement. In this alternative arrangement, which is proposed to comprise of an approximately 2 km section of underground cable with CSE compounds adjacent to RG84 (just to the south of the A1066) and to the north of RG91.
- 5.4.53 Initial consideration of the design of the underground cable section for the Waveney Valley Alternative identified that the central part of the valley, around the River Waveney, includes areas of peat. Given the sensitivity of such habitats the potential use of trenchless techniques (such as Horizontal Directional Drilling (HDD)) was proposed to be adopted with potential to cross the approximately 700 m extent of peat (noting that the 2023 preferred draft alignment crosses at the narrowest part). Subsequently, a review of available ground condition information suggests conditions comprise peat/peaty soils over sand and gravel. These specific ground conditions are considered likely to restrict the achievable distance for HDD to around 150 m from an excavated drive pit. Given this, it has been assumed that two HDD sections (each centred approximately on each of two main river channels) would need to be installed with the remainder of the underground cable being installed by open cut techniques. There would still be the option for trenchless installation across the full 700 m of peat / flood zone pending ground investigation results and further design.
- 5.4.54 There would be potential benefits of a section of underground cable in terms of landscape effects. A limited number of residential properties would also benefit from reduced effects on residential amenity in views from a small number of properties along the A1066 with views to the south over the valley.

Figure 5.8 Alignment for Waveney Valley Alternative

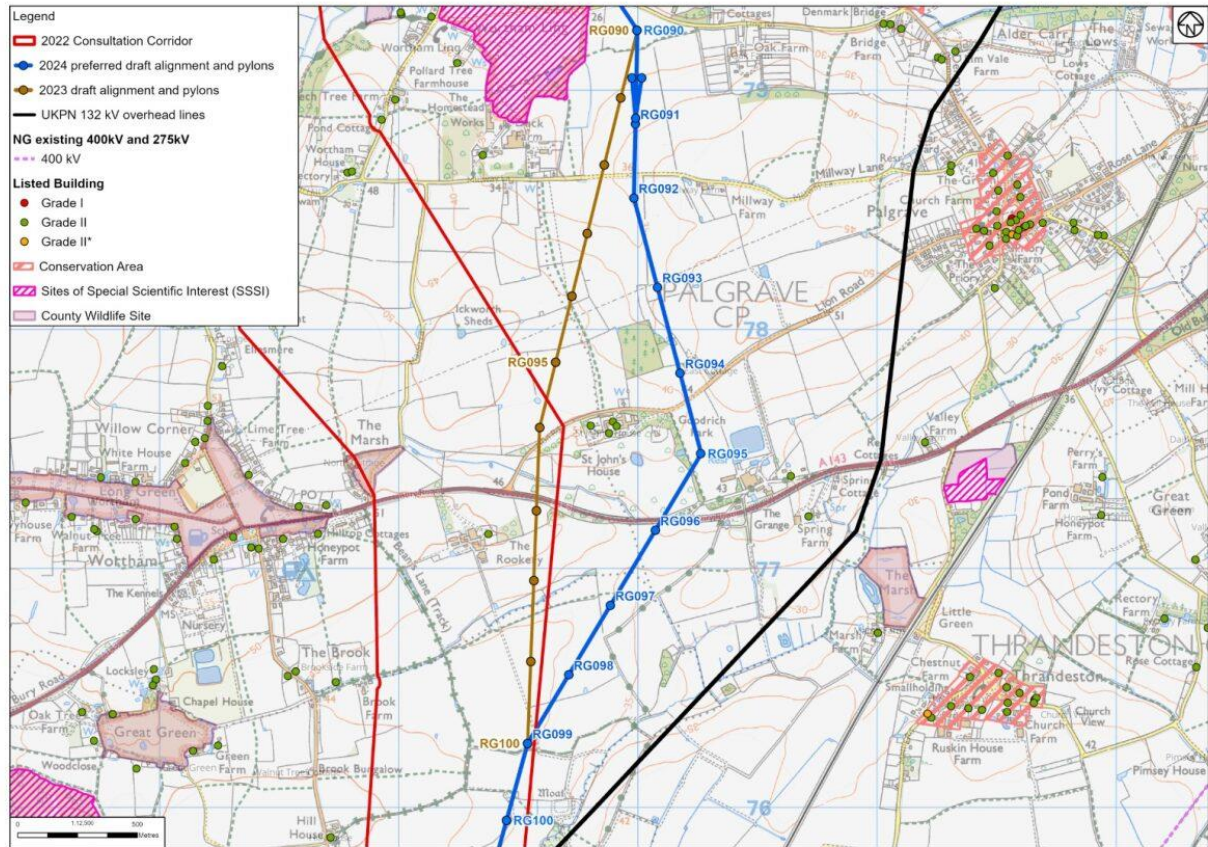


- 5.4.55 Effects on the setting of the Grade I listed church will be avoided (by the absence of pylons). There may however be increased effects on archaeological resource (paleo-environmental and buried remains due to the proximity of the moat) and there would be increased effects on the peat soils as a result of the construction disturbance.
- 5.4.56 There would be increased tree removal (above the open cut trenching section) and increased effects on ecological interests compared with the overhead line alternative. Effects on recreational amenity (after the construction period) would be avoided (by the absence of pylons).
- 5.4.57 National Grid is continuing to gather feedback and are undertaking further assessments to inform the final decision making in this area to either remain with the baseline overhead line proposals as per the 2023 preferred draft alignment or to take forward the Waveney Valley Alternative comprising around 2 km of underground cable between RG084 and RG091.
- 5.4.58 Feedback has suggested the use of underground cable should be considered in the section to the north of the A1066 (raised by residents in Roydon and Bressingham to reduce effects on residential amenity). However, given the presence of some filtering of views by existing vegetation and the distance between properties and the 2023 preferred draft alignment, National Grid does not consider that the level of effects justifies the substantial additional costs and effects arising from a change to underground cable technology north of the A1066.

Worthingham to Gillingham – Section B

- 5.4.59 Immediately south of the Waveney Valley a further change has been made to the 2023 preferred draft alignment. This is in response to feedback on the potential effects on flight activities at the Brook Airstrip, located to the west of RG099, and feedback about potential interaction with solar farm proposals (see Figure 5.9).
- 5.4.60 NPS EN-1 notes at paragraph 5.5.5 'UK airspace is important for both civilian and military aviation interests. It is essential that new energy infrastructure is developed collaboratively alongside aerodromes, aircraft, air systems and airspace so that safety, operations, and capabilities are not adversely affected by new energy infrastructure. Likewise, it is essential that aerodromes, aircraft, air systems and airspace operators work collaboratively with energy infrastructure developers essential for net zero. Aerodromes can have important economic and social benefits, particularly at the regional and local level, but their needs must be balanced with the urgent need for new energy developments, which bring about a wide range of social, economic, and environmental benefits.
- 5.4.61 After engagement with the airstrip operator, it was considered that if the Project remained on the 2023 preferred draft alignment there would be a need to terminate flying activities at the Brook airstrip as appropriate clearances could not be achieved with available pylon designs (the use of low height designs does not achieve the necessary clearance).
- 5.4.62 After further consideration it was concluded that achieving an alignment that supported the continuation of flight activities required a deviation to the east of the 2023 preferred draft alignment. Deviations to the west were constrained by the extent of residential properties at Worthingham which would have required necessitating a deviation directly west around RG092 towards Magpie Green before a deviation to the south passing the west side of Worthingham and reconnecting around RG110 to the west of Mellis. This less direct alternative alignment would be almost 2 km longer than the 2024 preferred draft alignment, with large direction changes less consistent with the Holford Rules and a transfer of effects to other receptors. This was therefore not preferred.
- 5.4.63 The 2024 preferred draft alignment deviates through a different solar farm development than the 2023 preferred draft alignment. This alternative further to the east would transfer effects from one planned solar farm development to another, though subject to final design of the solar farm and the overhead line alignment, the more eastern alignment would reduce the interaction with solar panels from three pylons (on the 2023 preferred draft alignment) to one (2024 preferred draft alignment). This alternative also changes the effects on residential amenity at a number of residential properties. On balance the effects are transferred from Rookery Farm and those near Duck Farm to East Cottage and The Grange. In the case of The Rookery and The Grange, pylons are screened from the properties to some extent, by farm buildings. For those near Duck Farm and East Cottage pylons have been positioned with some limited intervening filtering by trees. On balance with slight reduction in interaction with planned solar development and a transfer of residential effects it was considered that the change to allow continued flight activities was preferred to the closure of the airstrip. Ongoing assessment and feedback will continue to inform decision making around the need for the mitigation of cumulative effects with the 132 kV overhead lattice infrastructure located to the east and connecting to an existing 132 kV substation to the south of Diss operated by the local Distribution Network Operator.

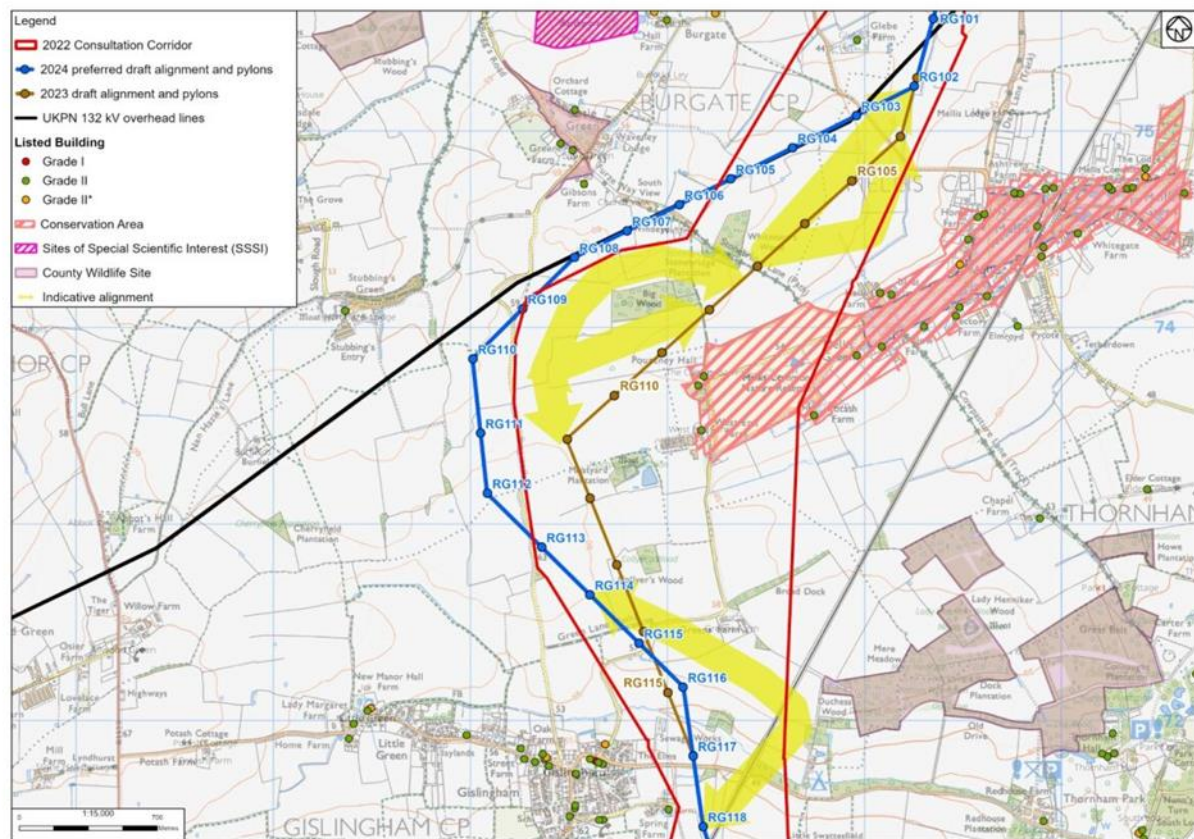
Figure 5.9 Alignment at Wortham



- 5.4.64 Around Mellis, consideration has been given to feedback proposing various changes to move the 2023 preferred draft alignment further north and west. The reasons given in the feedback refer to effects on heritage features (including views from the conservation area, setting of various listed buildings and the setting of various moats) as well as to effects on residential amenity and effects on land management (i.e. moving pylons to field boundaries).
- 5.4.65 In response to feedback localised changes that moved the 2023 preferred draft alignment further from Mellis, albeit remaining on the Mellis side of Big Wood and Stonebridge Plantation, were considered (see Figure 5.10). Such a change can only be achieved by introducing additional angle pylons and moving from an otherwise straight alignment. Whilst noting some slight reduction in effects by slightly increased distance to pylons, it was not possible to meet all requests to position pylons on field boundaries or corners. Overall, it was considered that the benefits would also be substantially offset by the greater visual effects arising from the additional angle pylons required (typically at least 3 additional angles to address the requests). On this basis the suggested changes were less preferred and have therefore not been taken forward.
- 5.4.66 National Grid also considered an option proposed in feedback to route between Big Wood and Stonebridge Plantation to reduce effects on residential properties in the vicinity of Pountney Hall. Whilst noting the reduction of effects to receptors around Pountney Hall, making this change would require additional angles and potentially two additional pylons. On balance it was considered that the level of effect experienced at these properties would not justify the additional infrastructure and subsequent costs.
- 5.4.67 Feedback from Historic England provided new information on heritage assets and identified that the undesignated moat around 200 m east of the 2023 preferred draft

alignment (RG111 & RG112) was considered to be of equivalent to schedulable value. Increasing the separation between the moat and the alignment was considered necessary to avoid unacceptable effects on the setting and required the 2023 preferred draft alignment to move to the west towards or just beyond Burgate Road. In considering how this could be achieved an alternative was identified with the potential to address several elements of feedback identified above. This alternative would replace the existing 132 kV overhead line with an underground cable between rebuilt cable sealing end platform pylons and then utilise the former 132 kV overhead line alignment for the 400 kV overhead line. This would deviate from the 2023 preferred draft alignment from RG115 respectively on the 2024 preferred draft alignment). Whilst this would require works to the 132 kV network, a section of the existing 132 kV overhead line has to be replaced by underground cable in any case for the 2023 preferred draft alignment as it would be crossed by the Project. Extending the length of undergrounding for the alternative can be achieved relatively efficiently.

Figure 5.10 Alignment at Mellis



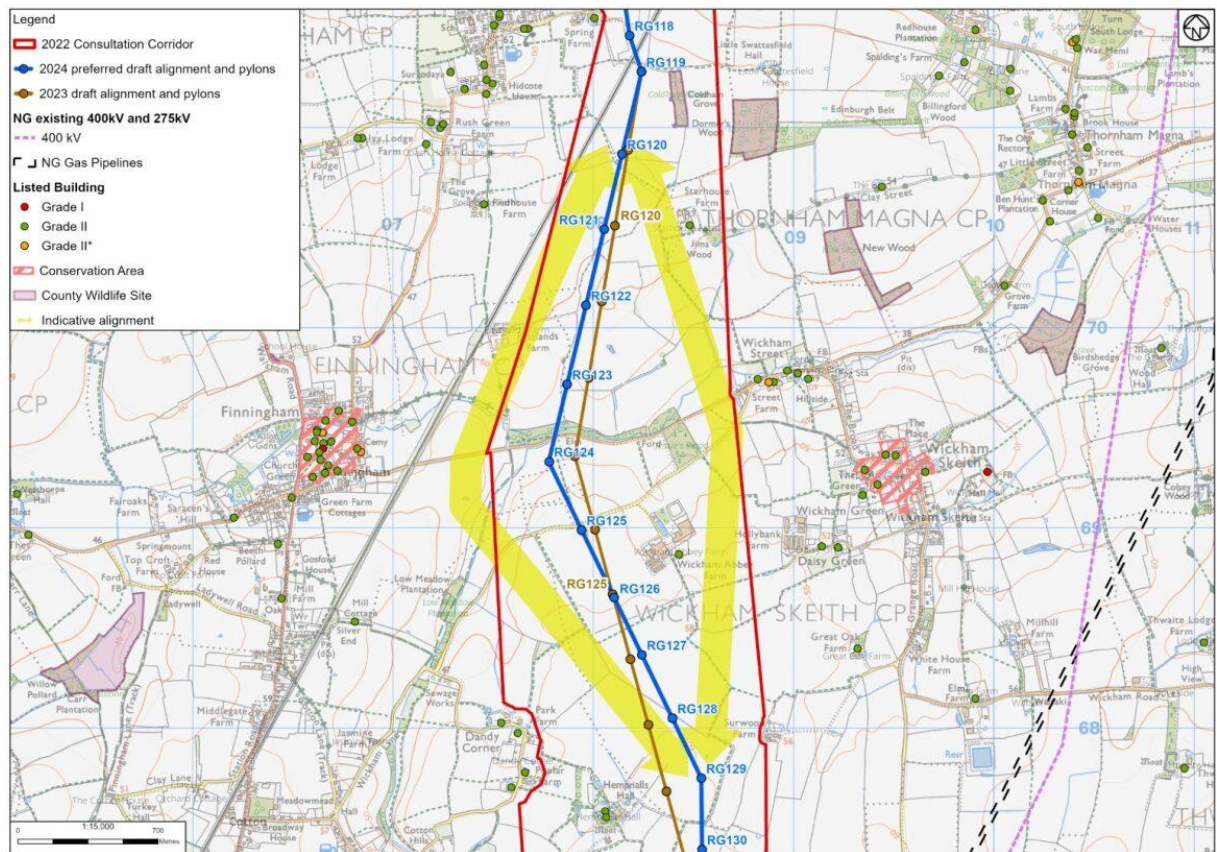
- 5.4.68 It is recognised that there would be an increased level of effect on residential amenity for those residential properties close to the existing 132 kV overhead line (including Church View, South View and Windeye) as a result of its replacement by taller 400 kV pylons. Replacing 132 kV lattice pylons with 400 kV lattice pylons would however result in a reduced magnitude of change overall when the much lower effects experienced by those properties in Mellis with views to the north-west is considered. This change would also reduce effects on views from the Mellis Conservation Area would more generally increase the separation between the unscheduled moat and the 2024 preferred draft alignment (from around 200 m for the 2023 preferred draft alignment) to around 600 m for the 2024 preferred draft alignment).

- 5.4.69 Whilst it is not possible to position all pylons on field boundaries the use of the 132 kV alignment does mean that there is relatively little change to the total number of pylons affecting agricultural operations. This compares with twice the number that would be required for the 2023 preferred draft alignment.
- 5.4.70 Taking all of this into account it is considered that the alternative is preferred, and it has therefore been taken forward in the 2024 preferred draft alignment.
- 5.4.71 To the south of Mellis respondents repeated previous feedback for a preference to position the crossing of the railway near to Gislingham (RG118 in the 2023 preferred draft alignment) further to the north. In the absence of further information on any material considerations or additional factors, it was considered that the rationale for the position of RG118 remains valid.
- 5.4.72 In summary a crossing north of the road / railway line would be a less direct alternative and would require a large angle pylon at approx. 150 m distance to a number of residential properties and a campsite. A crossing point to the south would also require a large angle pylon at approximately 150 m distance, but to fewer residential properties, with the closest property (Grade II Listed Spring Farm) benefitting from greater filtering of views by existing vegetation. The more northern crossing point would also unavoidably route through undesignated woodland adjacent to the road (immediately east of the railway). On balance therefore a crossing of the railway to the south of the road remains preferred and no change to the Project is currently proposed at this location.
- 5.4.73 As shown on Figure 5.10 there has been some slight modification to the 2023 preferred draft alignment to the north of the rail crossing. By changing RG117 to a suspension pylon and moving the angle pylon further north, the separation to residential properties at the north-east of the village is increased.

Gislingham to Mendlesham – Section B

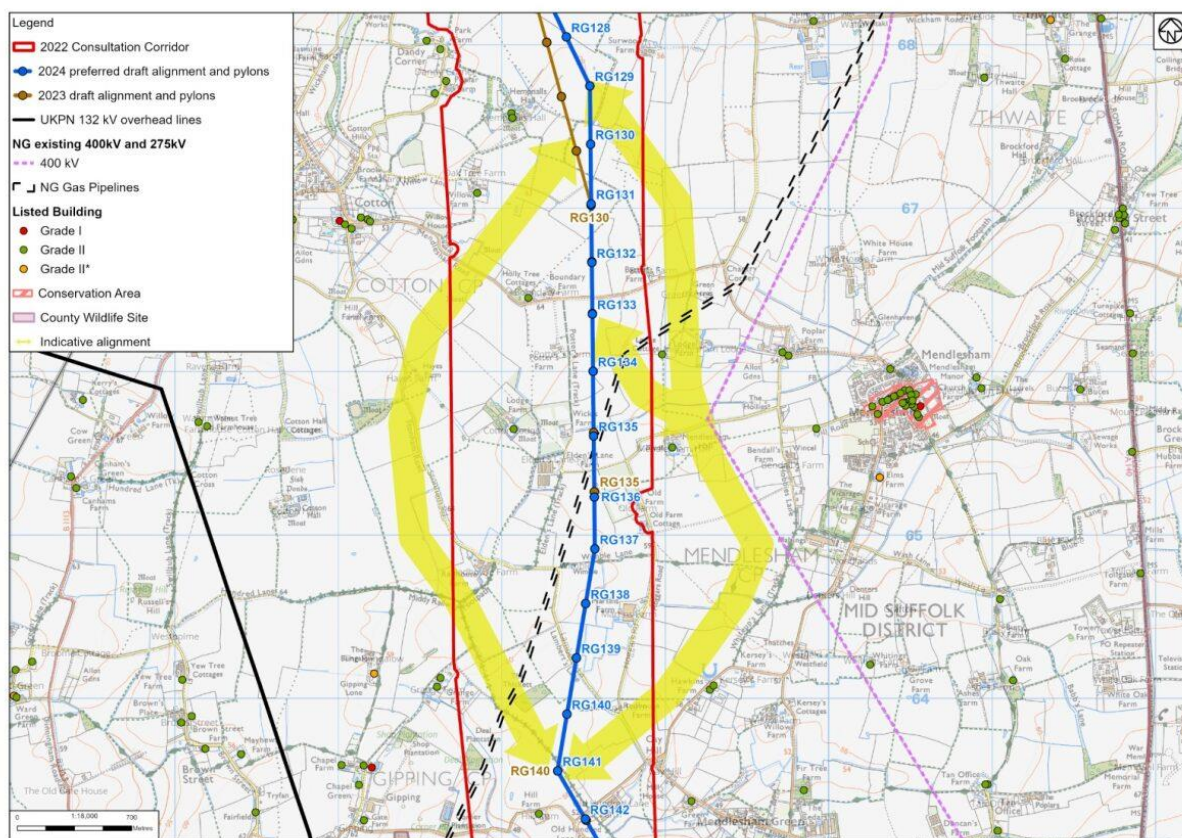
- 5.4.74 Feedback from landowners requested that the alignment followed field boundaries or for pylons to be positioned at field boundaries. Other feedback also stated a preference to move the 2023 preferred draft alignment further to the east to reduce effects on heritage assets and on residential views for various properties at or near to Hempnalls Hall.
- 5.4.75 By slightly increasing the angles of direction changes and moving the angle pylon RG123 (which becomes RG124 in the 2024 preferred draft alignment) to the west and moving the angle at RG130 (2023 preferred draft alignment) to the north to RG129 (2024 preferred draft alignment) landowner preferences can at least partly be met (RG122 and RG123 on the 2023 preferred draft alignment would move to field boundaries) (see Figure 5.11). Separation to Hempnalls Hall can also be increased without materially increasing effects on receptors to which the alignment has moved marginally closer. These minor adjustments to the west of Wickham Skeith have been included in the 2024 preferred draft alignment.
- 5.4.76 Other feedback requested moving RG123 (RG124 in the 2024 preferred draft alignment) further to the west to reduce effects on woodland. Whilst noting the potential for retention of a number of mature trees, this would only be achieved by moving the alignment to the west, closer to Eastlands Farm. Separation to this residential property would be reduced to under 100 m to avoid the area of woodland compared with around 300 m for the 2023 preferred draft alignment). There would also be a potential oversail of the menage area which would need to be mitigated. On balance retaining the 2023 preferred draft alignment at this location was preferred to avoid this transfer of effects to Eastlands Farm.

Figure 5.11 Alignment at Wickham Street



- 5.4.77 Where the Project converges to within about 700 m of the existing 400 kV overhead line between Norwich and Bramford, feedback was received that restated a preference for variations on route alignment to the west of Mendlesham. Feedback also proposed new alternatives (see Figure 5.12). It is to be noted that the 2023 preferred draft is straight at this location, and it is the existing 400 kV overhead line that deviates substantially to route past the west side of Mendlesham, leading to the overhead lines converging to around 700 m separation.
- 5.4.78 Some alternatives suggested in feedback sought to increase the separation between the proposed and existing 400 kV overhead line. It is considered however that these alternatives would transfer rather than reduce effects and therefore the more direct and straighter 2023 preferred draft alignment remains preferred in this location. Other alternatives proposed would have achieved a degree of paralleling but were less preferred as they lead to increased effects on heritage assets.
- 5.4.79 Other alternatives raised in feedback in the vicinity of Mendlesham sought to reduce overall effects by paralleling the existing 400 kV overhead line. However, these alternatives were considered to increase visual and residential amenity effects by either placing more residential properties closely between the existing and proposed overhead lines or would generally have required alignments to be positioned in much closer proximity to properties in order to avoid positioning residential properties with overhead lines close to both sides. On balance it was considered that the 2024 preferred draft alignment in the vicinity of Mendlesham remains unchanged from the 2023 draft alignment.

Figure 5.12 Alignment at Mendlesham



Mendlesham to Offton – Section B

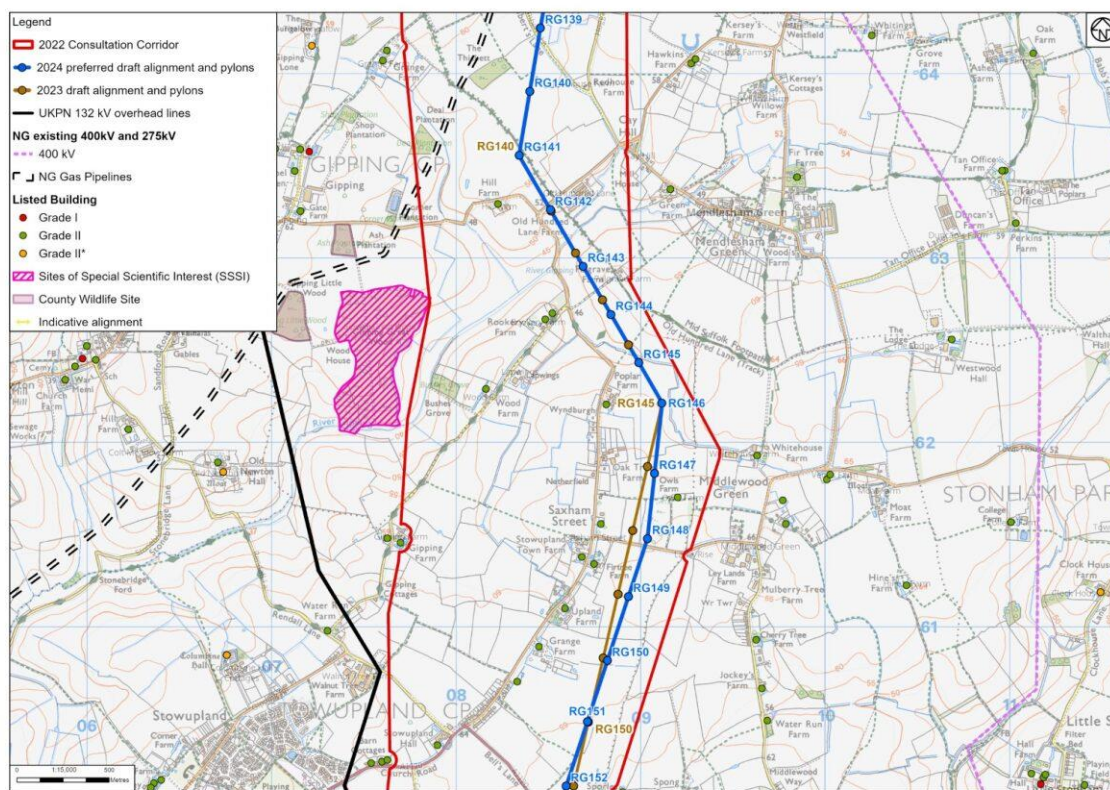
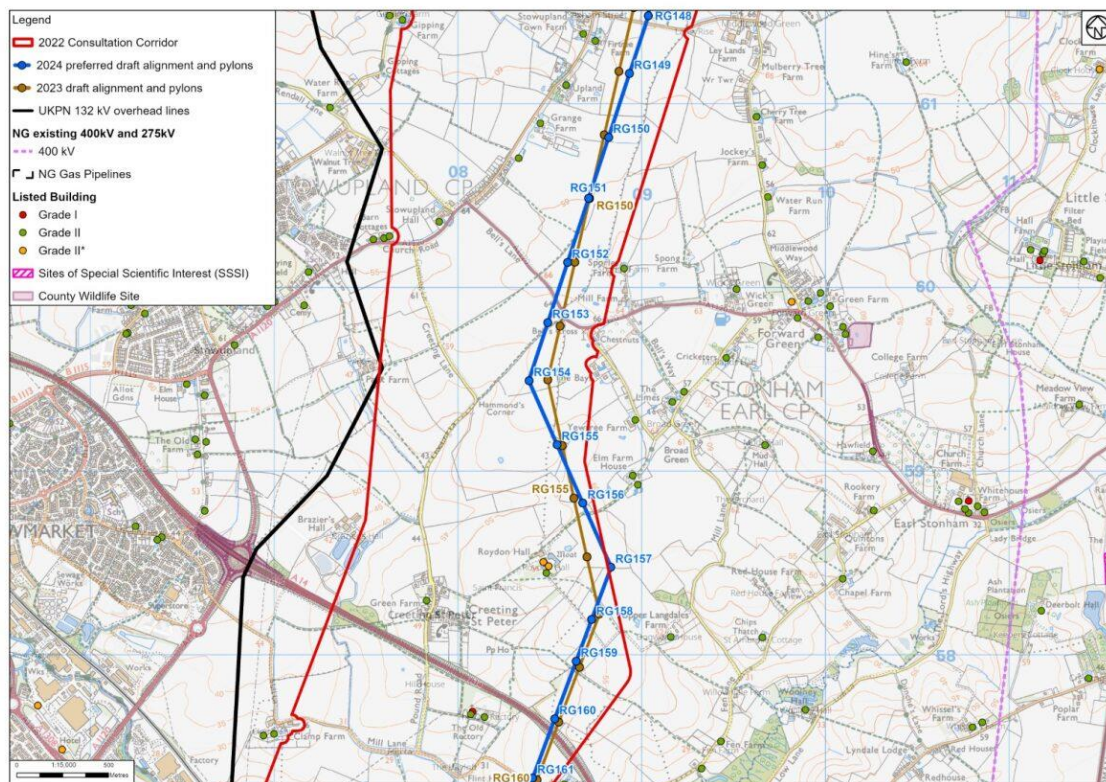
- 5.4.80 A feedback request to position the alignment around RG144 to the east of a residential property (by an alignment between RG137 (2024) and RG 146 (2024) which potentially removes one angle pylon) to reduce effects on residential amenity was considered but was not preferred. It was concluded that it would transfer and increase residential amenity effects to several other residential properties to the west side of Mendlesham Green, more than offsetting the benefits gained to the individual property. Pylons (RG143 and RG144 (2024 preferred draft alignment) have however been moved to be approximately equidistant to either side of the straight driveway to slightly reduce effects.
- 5.4.81 Other feedback restated a preference for an alignment to be routed to the west of Saxham Street. The absence of a route to pass between properties to the east of Stowupland, as set out in the 2023 Design Development Report, remains the main restriction and has been further compounded by a recent planning application for light industrial buildings to the north of Stowupland Hall. As such no viable alternative has been identified to the 2023 preferred draft alignment.
- 5.4.82 Feedback identifying various landowner preferences has been considered as well as feedback on effects on residential amenity. This has resulted in a series of interlinked changes to the 2023 preferred draft alignment between RG145 to RG161 (now identified as RG146 to RG162 in the 2024 preferred draft alignment) being taken forward.
- 5.4.83 Feedback identified a landowner preference to move RG147 (now RG148 in the 2024 preferred draft alignment) to the east to position it within a grass field rather than within a narrow arable field. This change would require an additional angle pylon and a slight deviation from a straight alignment. This would reduce consistency with some of the Holford Rules whilst increasing consistency with other Holford Rules by allowing for

slightly increased separation to be achieved to various residential properties (a number of which are listed buildings) at Saxham Street. This would reduce effects on both residential amenity and on the heritage assets. This change would also reduce separation from the nearest pylon to a listed residential property (Grade II Listed Doles Farmhouse at Owls Farm (from around 200 m to around 150 m) but with some intervening vegetation and farm buildings to partially filter and screen potential views. On balance the change is considered preferable and is included in the 2024 preferred draft alignment (see Figure 5.13).

- 5.4.84 Other feedback requested the positioning of pylons within a proposed solar farm (east of RG150), but this has not been taken forward. This change would have required, additional changes of direction requiring additional angle pylons and would have been less direct and therefore less consistent with Holford Rules. Whilst noting this was perceived to reduce impact on agricultural productivity by using land already proposed to be taken out of agricultural production, overall, the area of clearance required around a pylon base for construction and maintenance activities was considered to be more impactful on solar farm productivity than would be the case if pylons were positioned within arable or grazing land uses. as such the alternative was less preferred and not included in the 2024 preferred draft alignment.
- 5.4.85 Feedback also suggested moving the alignment south to reduce effects on residential amenity and on Grade II* listed heritage assets. Considered individually, this would have required a number of additional angle pylons and would have been less consistent with the Holford Rules. However, an alternative arrangement was identified (see Figure 5.13) that slightly modified the degree of angle change and position of angle changes along the 2023 preferred draft alignment but did not require any additional angle pylons. This alternative arrangement reduced effects on residential amenity and reduced effects on two Grade II* listed heritage assets without increasing effects on other potential receptors. This alternative arrangement moved RG153 alignment) around 100 m west and RG156 (both in the 2023 preferred draft alignment) around 150 m to the east also changing it to an angle and the pylon to the south to a suspension pylon. In light of the reduction in effects, this change was preferred and taken forward in the 2024 preferred draft alignment (as RG154 and RG157 respectively).
- 5.4.86 Feedback responses that reiterated previous requests and preferences to cross the A14 around the A140 junction, or to cross on or close to the alignment of the existing 132 kV overhead line near Stowupland have been reviewed. No additional factors nor new material considerations have been identified that would invalidate previous decision making. Alternatives close to the existing 132 kV overhead line are constrained by the Gateway 14 development and would have to pass close to the west of Creting St Peter. Whilst partly benefitting from following a shallow valley, such an alternative would lead to greater effects on residential amenity for properties in Creting St Peter that have open views to the west. Crossing closer to the A140 junction can only be achieved by close paralleling the existing 400 kV overhead line, which cannot be achieved for reasons set out from paragraph 5.3.12 of this document.
- 5.4.87 National Grid have engaged with Wattisham Flying Station to understand potential interactions with their activities. As set out in the 2023 Design Development Report, the 2023 preferred draft alignment is considered to have addressed potential areas of concern by establishing an alignment to the west which positioned the pylons on lower ground (than the graduated swathe presented in the 2022 consultation suggested) and more closely aligned it with one of the existing 132 kV overhead lines. This alignment means that Project infrastructure will not impact the Instrument Landing System (ILS) radar nor is at a height relative to the airfield in conflict with safeguarding guidelines.

Minor pylon adjustments in response to other landowner feedback, such as moving RG174 and RG175 out of the centre of views of nearby properties would not be expected to alter the nature of effects and therefore the 2024 preferred draft alignment remains unchanged from the 2023 preferred draft alignment at this location.

Figure 5.13 Alignment at Stowupland (two images)

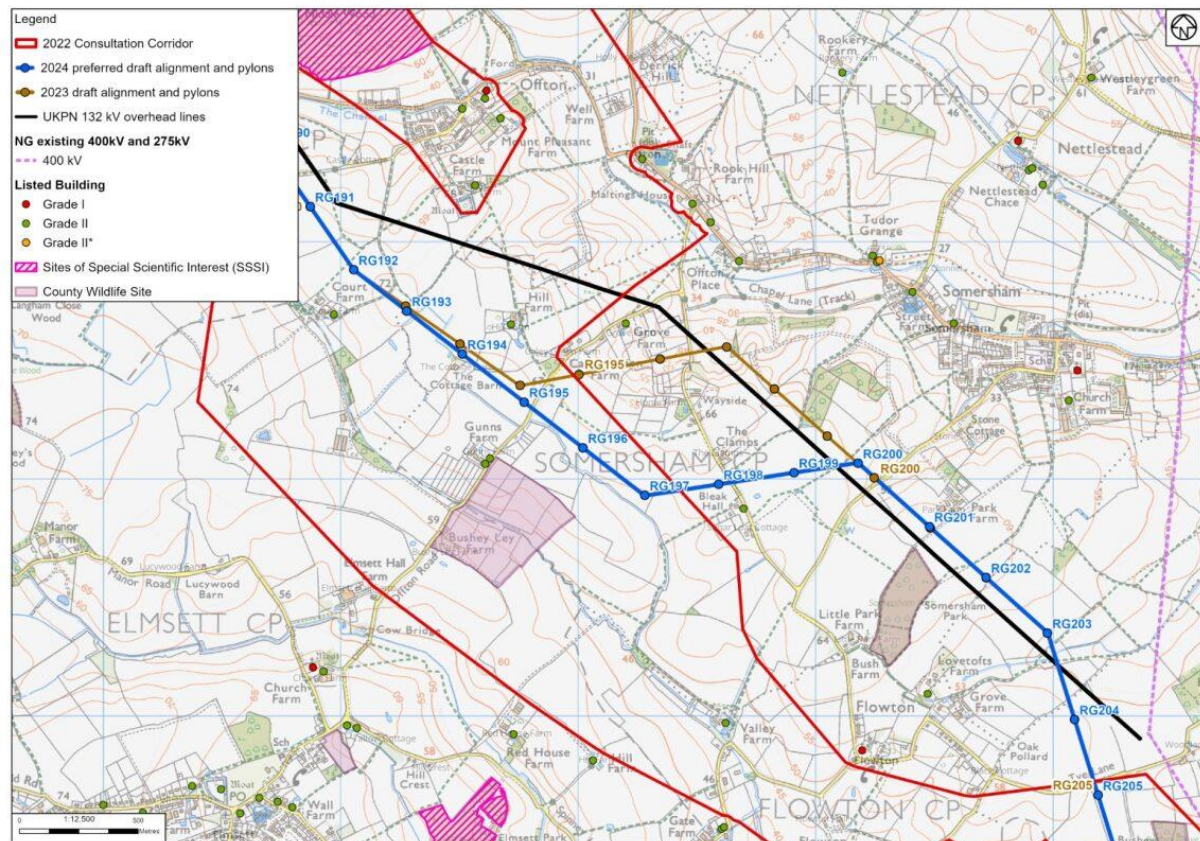


- 5.4.88 In addition, the removal of an existing 132 kV overhead line (discussed in more detail below) avoids adding an additional set of overhead lines south of Offton further limiting the change in overhead line infrastructure for Wattisham's activities (albeit the 400 kV pylons would be taller than the existing 132 kV pylons). The further potential for 132 kV overhead line removal to extend through to Stowmarket Substation is still being investigated as potential mitigation for effects on residential amenity near RG175 and is also subject to agreement with UKPN.

Offton to Bramford – Section B

- 5.4.89 A combination of feedback together with further consideration of the most economic and efficient solution has led to evolution and change to the Project design in this area.
- 5.4.90 It is now proposed, as an alternative to multiple crossings of the existing 132 kV overhead line (with each crossing requiring two cable sealing end platform pylons to terminate the overhead line at either side of the crossing), to replace the existing 132 kV overhead line with an underground cable connection from a rebuilt cable sealing end platform pylon (identified as PI35) to the north of Offton Wood through to the north of RG186 (identified as RG185 in 2023) this line currently terminates at PI15, and to connect to the existing underground cable into Bramford Substation.
- 5.4.91 Feedback proposed a change to the 2023 preferred draft alignment which oversail an equestrian school business (oversailed at RG196 on the 2023 preferred draft alignment) and also has residential amenity effects on views from around four properties (Grove Farm and others on Elmsett Road and Wayside to the south). Responding to this feedback, as shown on Figure 5.14, an alternative was considered that comprised continuing the alignment to the south-east of RG195 (previously RG194 in 2023) before turning east to rejoin the route of the 2023 preferred draft alignment at RG200 which itself would be repositioned to the northwest of its 2023 location. This alternative would stay on slightly higher ground than the 2023 preferred draft alignment, which partially drops onto lower ground, however this slightly reduced consistency with the Holford Rule achieves the avoidance of the oversail of the equestrian school business. Additionally, the alternative reduces overall effects on residential amenity albeit some transfer of residential amenity effects occurs to two properties (The Clamps and Bleak Hall) even with pylons positioned outside main views.
- 5.4.92 Feedback restating a preference for alternative alignments within or to the west of the 2022 Consultation Corridor between Offton and Bramford Substation was also reviewed. In the absence of additional factors or new material considerations it is considered that these alternatives are less preferred. Alignments to the south of Flowton or closer to Elmsett transfer effects to other receptors and increase effects on Grade I listed churches (Church of St Mary and Church of St Peter respectively). It is also notable these alternatives alignments do not directly require the replacement of the existing 132 kV connection with underground cable meaning that any such change (to install underground cable in the place of the 132 kV overhead line) would be determined by the outcome of a cumulative assessment of effects of the various overhead lines which may not in themselves be of sufficient magnitude to lead to a change.

Figure 5.14 Alignment at Offton



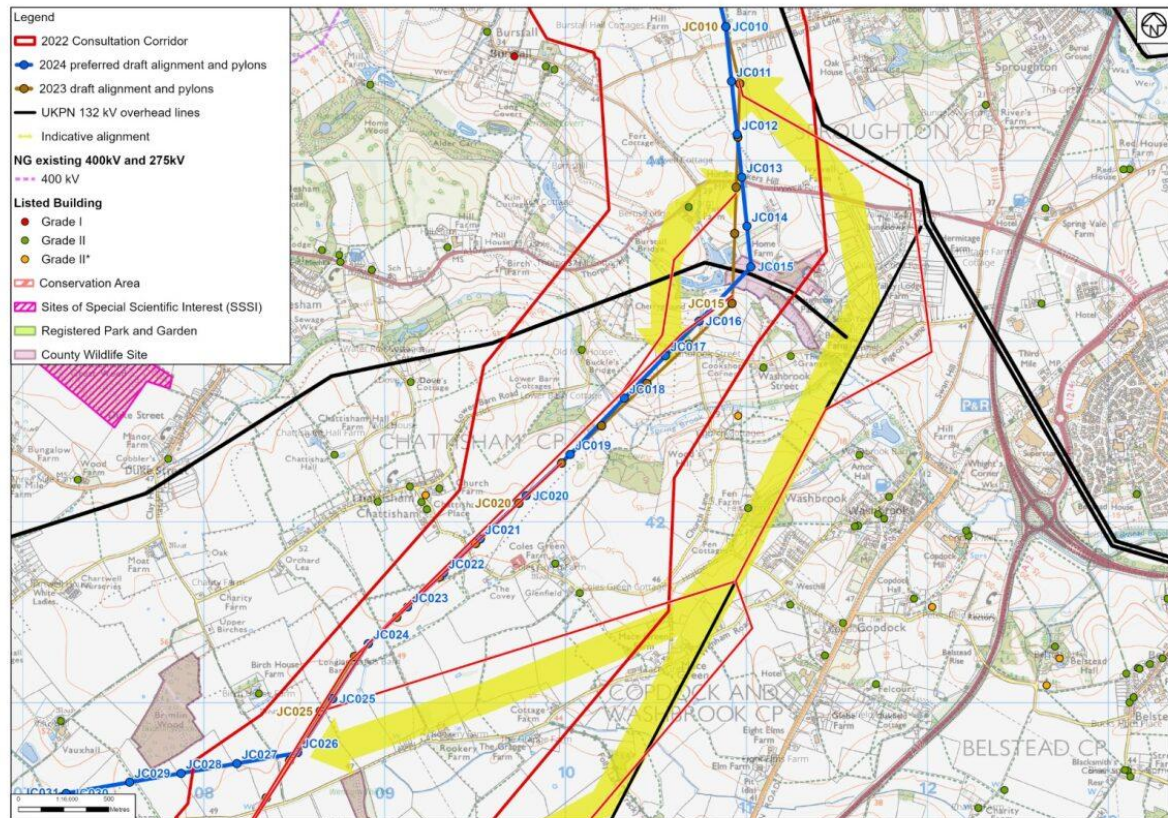
Bramford to the AONB including CSE compound location – Section C

- 5.4.93 Section B ends just to the south of Bramford Substation with the remainder through to the EACN substation within Section C.
- 5.4.94 National Grid can confirm that sections of the existing 132 kV overhead lines approaching Bramford Substation from the south will be replaced with underground cable to facilitate positioning of the 400 kV alignment. The 132 kV overhead line to the south-east of Bramford (referred to as the PLD line) is proposed to be replaced by underground cable from Bramford Substation to a new cable sealing end platform pylon to the east of PLD48 and a second 132 kV overhead line to the south-east (the PHB line) will be replaced by underground cable from Bramford Substation to the south of PHB22 (see Figure 5.15).
- 5.4.95 As shown in Figure 5.15, feedback proposed the adoption of the alignment of the 132 kV overhead line from Bramford Substation through to the EACN substation. This has been considered as it may have offered an opportunity to reduce the magnitude of change. The existing 132 kV overhead line however passes between and very close to residential properties (in the order of 30 m from centreline) where the greater scale of the 400 kV infrastructure means that insufficient space is available to achieve acceptable separation from residential properties. This occurs at a number of locations, for example at Mace Green, where there are residential properties to each side at approximately 30 m from the overhead line centreline to each side and at White Horse Road in East Bergholt.
- 5.4.96 Similarly, there would be increased scale of effects where the existing 132 kV overhead line passes through woodland as additional woodland removal would be required if

replaced by 400 kV infrastructure. Whilst deviations could reduce such effects, they would require multiple angle changes, which would reduce consistency with Holford Rules and have a subsequent increase in environmental effects.

- 5.4.97 Overall, alternatives following the existing 132 kV overhead line were not preferred and the 2023 alignment has been taken forward as the 2024 preferred draft alignment.

Figure 5.15 Alignment at Chattisham

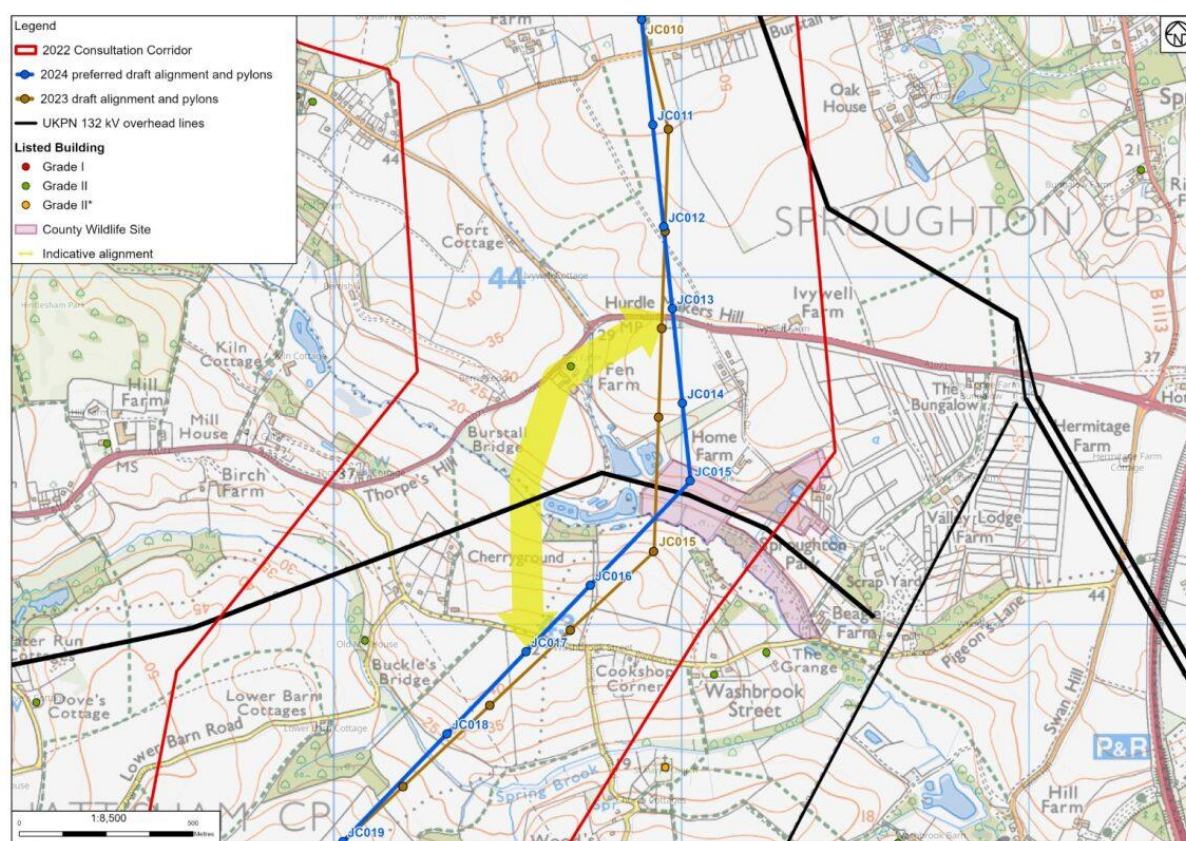


- 5.4.98 No conclusion has yet been reached as to whether there is a need to remove the existing 132 kV overhead line through the AONB to mitigate for effects on the AONB arising from the construction of the Project. Removal would either require replacement with an underground 132 kV underground cable connection (likely to be along a similar alignment to the 132 kV overhead line) or the introduction of a Grid Supply Point substation at Lawford close to the EACN substation, to allow the 400 kV connection infrastructure to fulfil the current function of the 132 kV connection. Feedback and assessment findings will inform decision making on this aspect, with the additional cost needing to be justified as being required to mitigate the effects of the Project and being an economic and efficient solution.
- 5.4.99 Immediately south of Bramford (see Figure 5.16), minor adjustments to the 2023 preferred draft alignment and pylon positions are proposed between JC010 to JC020 (pylon numbers are unchanged) to respond to feedback and likely restrictions to existing land use activities.
- 5.4.100 Changes have been made here to avoid oversail of the Hintlesham Fisheries lakes. The 2023 preferred draft alignment could have resulted in cessation of fishing on half of the lakes (due to the need to maintain safe clearances under the alignment) and could have led to business closure. To achieve the change an alternative arrangement has been

developed which moved the alignment slightly further from a new residential property on the south of Burstall Lane but slightly closer to around four residential properties on Valley Farm Drive (separation at around 110 m compared with around 160 m on the 2023 preferred draft alignment), potentially to the side of rear views. Although the angle pylon to the south would have to be positioned in the Sroughton Park CWS it would be on an area of lower ecological interest.

- 5.4.101 On balance it is proposed to take forward this alternative on the basis that whilst residential amenity effects and ecological effects are potentially increased there are opportunities for additional mitigation and the revised alignment would allow the fishery business to continue to operate.
- 5.4.102 An alternative passing to the west of the Hintlesham Fishing lakes (between the lakes and Fen Farm) was also considered. Whilst this would move the alignment further from the residential properties on Valley Road it would transfer effects to other residential properties and require the use of multiple angle pylons, increasing local visual effects. This was less preferred than the alternative described above.

Figure 5.16 Alignment at Hintlesham Fisheries

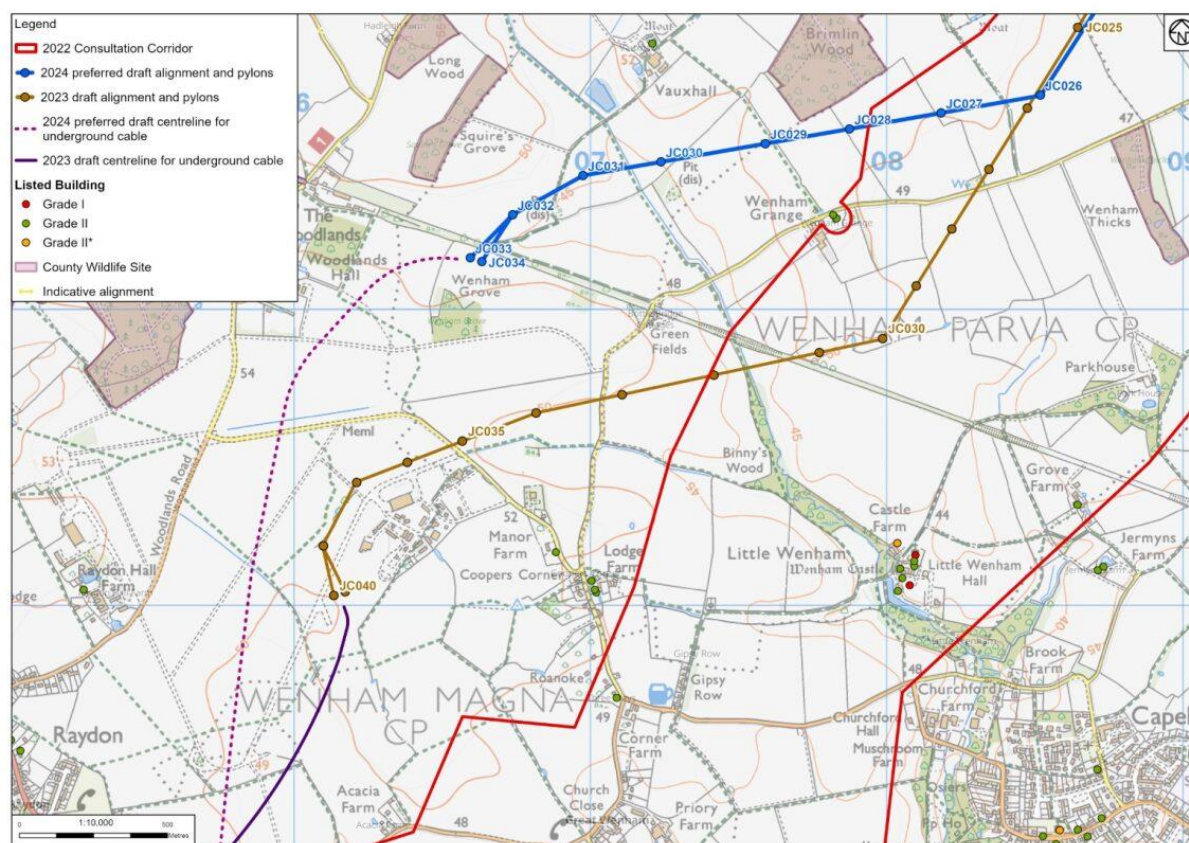


- 5.4.103 The alternative taken forward at Hintlesham Fisheries has consequential benefits, moving the alignment slightly to the south, responds to feedback to move the Project further from residential properties. The change repositions the angle pylon from the south to the north of the watercourse and allows the pylons to be repositioned to the north, to move further from residential properties around the Washbrook Street and Spring Road junction (increasing the distance to the nearest pylon from around 90 m to around 180 m).
- 5.4.104 Consultation feedback also highlighted, a need to change the 2023 preferred draft alignment to allow continued flight activities from Raydon Airfield and provided additional

information on potential effects on heritage assets at Little Wenham (various listed buildings including Grade I) and an undesignated war memorial. Further assessments undertaken by National Grid had also noted potential effects in longer views from within the AONB. Alternative siting for the CSE compound was considered with the potential for effects arising from the overhead line connection to a CSE compound from Bramford, and onwards underground cable connection to the EACN substation.

- 5.4.105 Engagement with Raydon Airfield identified that there was insufficient clearance to the 2023 preferred draft alignment. To achieve the necessary clearance required the overhead line to either be moved further south from JC30 or further north from around JC26. A southwards move was considered but not taken forward as it would increase effects on the heritage assets at Little Wenham. On this basis this was not considered acceptable in terms of National Grid's statutory duties and policy (set out in NPS EN-1, EN-5 etc) and heritage specific policies (e.g. Planning (Listed Buildings and Conservation Areas) Act 1990).
- 5.4.106 Alternative locations for the CSE compound were considered guided by the Horlock Rules. These included a site between Wenham Grove and the disused railway as well as a site to the north of the disused railway (around JC032 on the 2024 preferred draft alignment). Siting north of Wenham Grange using Brimlin Wood as screening / backclothing (around JC029 to JC028 on the 2024 preferred draft alignment) was also considered (see Figure 5.17).

Figure 5.17 CSE siting and alignment north of the AONB



- 5.4.107 Compared with the 2023 proposed site at Notley Enterprise Park, the alternative, to the north of Wenham Grove but south of the disused railway, would provide a location which would benefit from more screening from long distance views (some from within the AONB). It would also reposition the 2023 preferred draft alignment further north reducing

the potential effects on the heritage assets at Little Wenham (increasing separation from around 750 m to around 1500 m). In addition, it would allow continued flight activities at Raydon airfield, avoid effects on a model aircraft club (which uses land occupied by the 2023 proposed CSE compound location) and reduce heritage effects on the war memorial. This change would however also transfer some effects from residential properties at Bottle Bridge Corner and Wenham Grange to those at Vauxhall.

- 5.4.108 The alternative site adjacent to this but to the north of the disused railway would achieve similar beneficial changes in respect of views from the AONB, the flight activities at Raydon Airfield and heritage effects at Little Wenham but is considered less well screened from views from the north (albeit mitigation planting would address this over time) and would increase effects at Vauxhall. It also requires a longer section of underground cable and therefore provides a less economic basis for the connection.
- 5.4.109 Other alternative locations further east, near Brimlin Wood, would provide similar beneficial change and also would also reduce effects further by the replacement of around 1 km of overhead line by underground cable through predominantly arable farmland. However, such a change to underground cable is not considered to be consistent with the criteria set out in NPS EN-5 paragraph 2.9.23. This change would be less economic and therefore is not considered to be justified.
- 5.4.110 Overall, it was concluded that a change of CSE compound location to the alternative site to the north of Wenham Grove but south of the disused railway is now preferred. This includes consequent adjustments to east and west overhead line and underground cable connections. The change reduces effects on the distant views from AONB, supports continued flight activity at Raydon Airfield as well as reducing effects on heritage assets. This reduction is considered to be required to be consistent with National Grids duties and relevant planning and heritage policies, with the Project representing the most economical way of achieving those aims locally.
- 5.4.111 Consideration has also been given to feedback specifically proposing a number of alternative variations to move the overhead line further from the cluster of listed buildings at Little Wenham by extending the underground cable further from the boundary of the AONB either further to the north or further to the east (potentially through to Bramford Substation).
- 5.4.112 Residential properties and other constraints to routeing mean any potential alternative to the north has to be routed to the north of the existing and proposed 400 kV Bramford to Twinstead Reinforcement overhead line, necessitating two crossings of existing 400 kV infrastructure.
- 5.4.113 Potential alternatives to the east were considered, with underground cable extending towards lower ground near Washbrook or through to Bramford Substation. In neither case is the landscape designated such that it would lead to a presumption for underground cable (as set out in EN-5 paragraph 2.9.10) nor are potential landscape and visual effects considered to be at a level to justify the effects and additional costs of underground cable in line with NPS EN-5 paragraph 2.9.23.
- 5.4.114 Similarly, whilst based on preliminary assessments, heritage effects are not considered to require the need for adoption of underground cable given that an alternative overhead line alignment is available that can achieve separation from the listed buildings and that substantively reduces potential effects. There is therefore no basis in policy to consider the residual effects arising from an overhead line to be such as to justify the additional costs and effects of more extensive underground cabling to reduce potential heritage effects on the features at Little Wenham.

North of the AONB to the EACN substation (underground cable) – Section C

- 5.4.115 With the exception of the adjustment required to connect with the proposed revised CSE compound location, routing of the underground cable corridor from the north of the AONB to the EACN substation has not materially changed from the 2023 preferred draft alignment with the majority of the route proposed to be installed using open cut techniques.
- 5.4.116 A number of additional locations have however been identified where it is proposed to utilise a trenchless crossing technique such as Horizontal Directional Drilling (subject to confirming appropriate ground conditions). The proposed locations for this and reasons for preferring this technology in these locations are set out as follows:
- archaeological area principally to the south of Higham Road but also extending a short distance to the north. Additional information has identified an area of particular archaeological interest (including a number of Bronze age barrows) to the south of Higham Road. It is considered that effects will be considerably reduced by the adoption of trenchless technology to pass under these features;
 - River Stour crossing - it may be possible to develop an approach to cross the River Stour by the use of open cut techniques (use of coffer dams or over-pumping), however, to reduce effects given the ecological sensitivity (including SSSI, Ramsar and European designations downstream) it is proposed to utilise a trenchless crossing technique. Available ground investigation information suggests that conditions are such (peat/peaty soil over sand and gravel) that the use of a trenchless technique (such as Horizontal Directional Drilling) is potentially restricted. Achievable distances are influenced by localised conditions but are likely to be a maximum of around 250 m (and potentially much less than this) with the remainder of the underground cable needing to be installed by open cut techniques. We will continue to gather feedback and information to inform final decision making in this area;
 - woodland area within the Dedham Vale AONB adjacent to the Grade I Listed Church of St Mary - apart from their ecological value, areas of woodland are important features of the AONB and in this case would also provide screening for the Grade I Listed church. The use of a trenchless crossing technique is therefore included to allow retention of the woodland;
 - A12 crossing - given the importance of the A12 for traffic movements, and the additional technical complexities of embanked sections, open cut trench installation methods are not considered appropriate for this road crossing and therefore trenchless techniques are proposed; and
 - railway crossing to the east of Ardleigh - in order to minimise the potential for effects on rail infrastructure a trenchless crossing technique will be adopted to cross under the rail line to the east of Ardleigh.
- 5.4.117 A number of respondents proposed specific restrictions to working areas or proposed moving the underground cable corridor as it enters the AONB from the north. These were:
- Bobbitts Hall – it may not be possible to restrict construction to the west side of an area of hedgerow (although this will be subject to the outcome of ground investigations). It may however be possible to work to either side to avoid direct effects to the hedgerow; and

- Pintins - the underground cable alignment cannot be moved to the east beyond the hedgerow to the east of the first field due to proposed mineral workings, the presence of a gas pipeline and a number of veteran trees.

EACN substation - Section C

- 5.4.118 Feedback to the consultation included restatement of the preference for the EACN substation to be sited at other locations. The previous findings have been reviewed and it has been concluded, in the absence of additional factors or new material considerations, that the proposed EACN substation site close to Lawford Substation remains preferred for the reasons set out in the 2023 Design Development Report (paragraphs 5.5.84 to 5.5.98) which are summarised as follows. Sites closer to the coast would lead to greater environmental effects because of the two overhead line connections that would be required through the Tendring Peninsula noting that there is not considered to be a basis to support one or other of these connections being installed as underground cable in line with NPS EN-5. Sites proposed to the north and/or west of Ardleigh are less preferred either because they do not have the scale to accommodate the EACN substation and customer substations, or because of the effects arising from the need to use multiple corridors, including through the AONB, to install the underground cable connections for the customers and potential UKPN back feed. National Grid is however continuing to review the requirements in the context of emerging design development.
- 5.4.119 No final decision has yet been taken on the technology choice to be adopted (Air Insulated Substation (AIS) or Gas Insulated Substation (GIS)). In the absence of a requirement for GIS (normally only adopted when in close proximity to marine environments or where space is very constrained) we are continuing to progress on the basis that AIS technology is most likely. Although AIS requires more extensive land area it has reduced visual effect by virtue of generally lower height equipment.

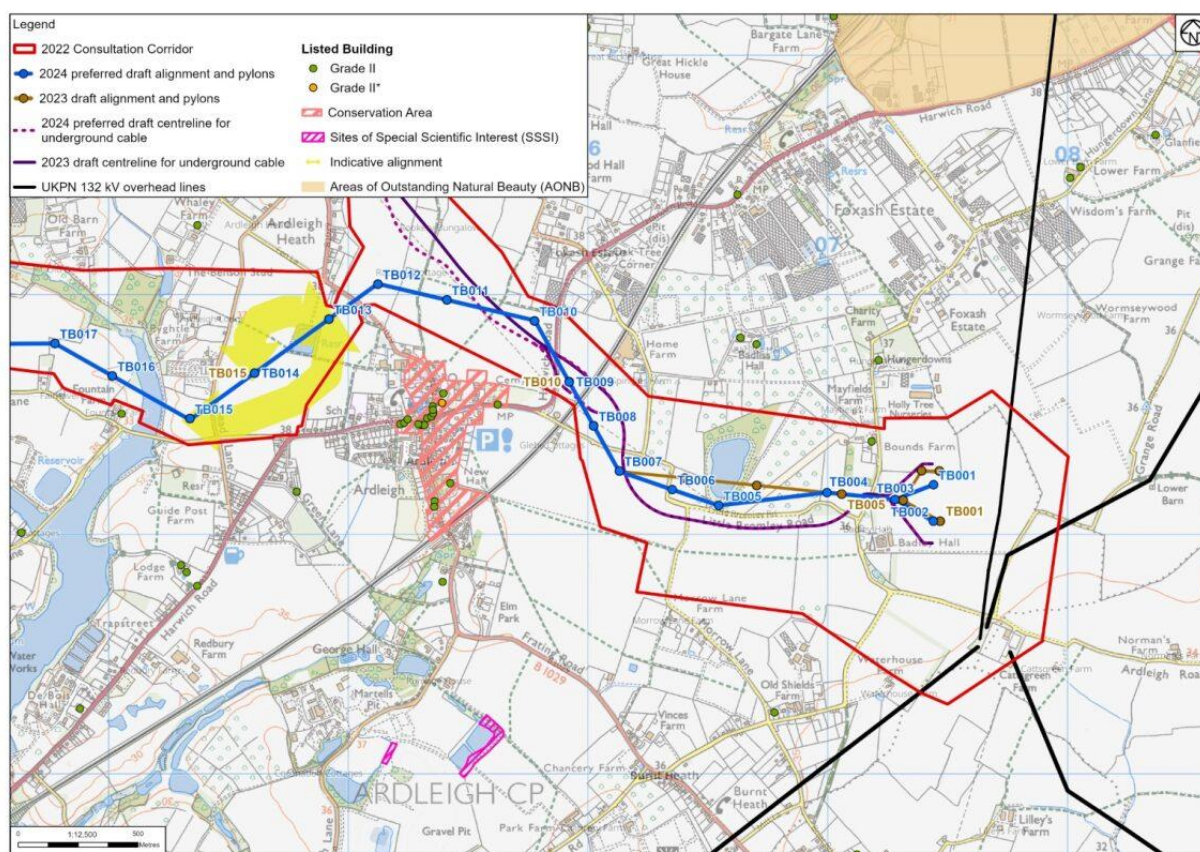
EACN substation to Great Horkesley (Eastern CSE compound) – Section C and D

- 5.4.120 The route commences in Section C, changing to Section D at the A12 in the TB overhead line section.
- 5.4.121 Feedback from various respondents requested the proposed overhead line be replaced by the use of underground cable between the EACN substation and the Great Horkesley underground cable section. This area is not subject to designations that change the presumed general acceptability of overhead lines (as set out in EN-5) although the overhead alignment is relatively close to the Dedham Vale Natural Landscape (AONB). However, whilst potentially visible from locations within the AONB it is not considered that this would lead to effects that would justify, in policy terms, the very substantial additional costs and environmental effects arising from the installation of underground cable.
- 5.4.122 Additionally, there are various locations (for example the crossing of Ardleigh reservoir and at the Wick Lane and Old Ipswich Road junction) where the adoption of underground cable would present substantial technical challenge that may not be possible to address without further increased effects. It is therefore considered that the use of 400 kV overhead line is still the most appropriate connection technology in this area.
- 5.4.123 Heading west from the EACN substation, minor adjustments to the 2023 preferred draft alignment are proposed with the removal of pylon TB03 (as identified in 2023) as a result of modifications to the line entry arrangements at the EACN substation (see Figure 5.18).

- In response to feedback to avoid effects on the trees along the southern boundary of Bounds Farm (to the north of span TB003 to TB004 (identified in 2023 as TB004 to TB005)) the construction swathe will be restricted here.

5.4.124 Through landowner engagement the potential for effects on a fishing lake due to oversail by the overhead line between 2023 preferred draft alignment pylons TB006 and TB007 has been identified. Where such oversail occurs, fishing activity would need to be restricted for safety reasons and here the 2023 preferred draft alignment would potentially have affected around half of the lake. The alternative is to realign the overhead line between TB004 and TB007 (identified as TB005 to TB008 in the 2023 preferred draft alignment) introducing additional angle pylons to reduce the oversail, with pylons also positioned to reduce effects on a fruit farm. This change introduces two additional angle pylons with consequent additional visual effects (and is less consistent with the Holford Rules). The closest residential properties either benefit from some visual screening (e.g. Bounds Farm) or are at around 500 m or greater distance. On balance it is considered preferable to take forward the realignment to reduce the impact on the fishing lake on the basis of the separation and / or vegetation filtering between the angle pylons and the closest residential properties.

Figure 5.18 Alignment at Ardleigh



5.4.125 Feedback and technical review led to consideration of alternatives to cross another water body to the west of Ardleigh to the south-west of TB013 (2024 previously identified as TB014 in the 2023 preferred draft alignment) (see Figure 5.18), In view of the orientation and size of this waterbody the safety considerations would effectively preclude what were reported to be relatively informal and infrequent angling activities, if the 2023 preferred draft alignment was retained. Alternatives to avoid oversail of the water body, to allow continuation or intensification of angling were considered. These would necessitate multiple changes of direction, give routing constraints and the presence of residential

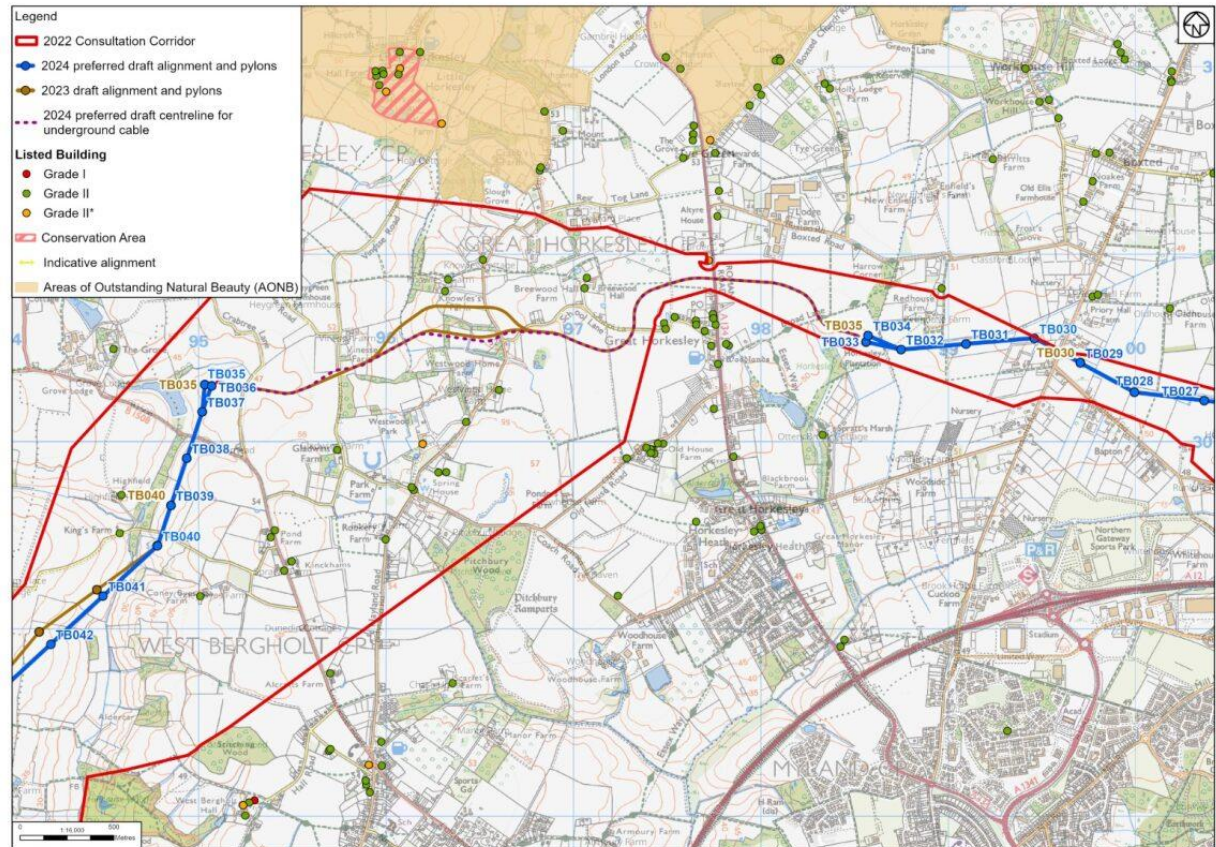
properties, whether passing to the east (residential properties within 200 m) or west (residential properties within around 100 m) of the water body.

- 5.4.126 These multiple angle changes would reduce consistency with the Holford Rules and increase effects to multiple residential properties close to the alignment in this area. Due to the limited and informal level of angling activity and the additional environmental effects from the alternatives, retain the straighter 2023 preferred draft alignment and oversail the waterbody was preferred although recognising that this would terminate the informal angling arrangements. Compared with angling activities discussed in respect of the lake to the east of Ardleigh, the fishing activity in the water body to the west is more limited and informal and the alternative would have much reduced separation to residential properties hence why a different conclusion is drawn.
- 5.4.127 The proposed draft order limits have been widened around the junction of Wick Lane and Old Ipswich Road adjacent to the A12 to facilitate a response to several development proposals. The 2024 preferred draft alignment avoids the proposed developments and engagement is ongoing with various parties regarding the detail of the individual planning applications (distribution warehouse, light industrial units, quarry, and a water supply reservoir). The final outcome of those discussions may necessitate some limited adjustment to routeing post statutory consultation to minimise interaction with the various proposals.

Underground cable at Great Horkesley – Section D

- 5.4.128 In response to feedback, we have removed the previously proposed split corridor to the south of Knowles' Farm and restricted the construction corridor to the south of a belt of trees. This does require the draft order limits to be widened to east and west to accommodate the construction works.
- 5.4.129 Feedback suggested a number of alternative locations for the CSE compounds to the eastern and western ends of the underground cable section at Great Horkesley in order to reduce potential effects. The alternatives proposed were:
- East – To the eastern edge of the field proposed in the 2023 non-statutory consultation;
 - East – Into the next field to the east (around TB032);
 - East – To the east of TB029 (previously identified as TB030); and
 - West – To around TB040.
- 5.4.130 Locations to the east, moving the CSE compound to the edge of the field or to the next field to the east, were seeking additional screening to views from residential properties to the north (at over 400 m separation) or to move the CSE compound out of a highly productive agricultural field.
- 5.4.131 Whilst noting the potential to reduce visual effects to the particular residential receptors, these alternative CSE compound locations were previously considered (2023 Design Development Report) and remain less preferred for the following reasons. The location of an existing gas pipeline restricts the extent to which a localised eastwards move can be made whilst ensuring safe working stand-off is maintained. A move eastwards would also require an extended length of underground cable (with associated effects and costs) in circumstances where it is considered that the level of effects on the AONB and on residential amenity do not meet the thresholds identified in NPS EN-5. On this basis these alternative locations are less preferred.

Figure 5.19 Alignment at Great Horkesley



- 5.4.132 Feedback also suggested, a further alternative to the east, to around TB028 (on the 2024 preferred draft alignment) to reduce effects arising from close proximity of an overhead line to a number of residential properties around the crossing of Straight Road. At this location there are a number of properties to each side of the overhead line at under 100 m to the centreline (closest at around 70 m) though distance and level of screening of the nearest pylon varies. This alternative would reduce some effects to residential amenity for several residential properties but would require approximately 1.5 km of additional underground cable with the costs and environmental effects arising from the alternative technology.
- 5.4.133 The location for the east of Great Horkesley CSE compound proposed within the 2023 preferred draft alignment is outside the AONB designation. National Grid also considers that any effects on the AONB or on other receptors in terms established in NPS EN-5 Section 2.9 do not occur at a level that would be considered to meet a threshold justifying the effects and additional cost of a further 1.5 km of underground cable. On this basis the alternative CSE compound location to the east, in the vicinity of TB028 (on the 2024 preferred draft alignment) is less preferred and no change to the eastern CSE compound is proposed.
- 5.4.134 An alternative location for the western CSE compound at Great Horkesley was raised in feedback with a preference for a location closer to TB040 (2023 preferred draft alignment). This site was considered as part of the development of the 2023 preferred draft alignment but it was less preferred. Respondents providing feedback requested moving the location of the western CSE compound further to the south to reduce residential amenity effects to a number of residential properties and to reduce effects on the AONB. Whilst acknowledging the reduction in effects from such a change, it is noted that the change would transfer such effects to other residential properties. It is also

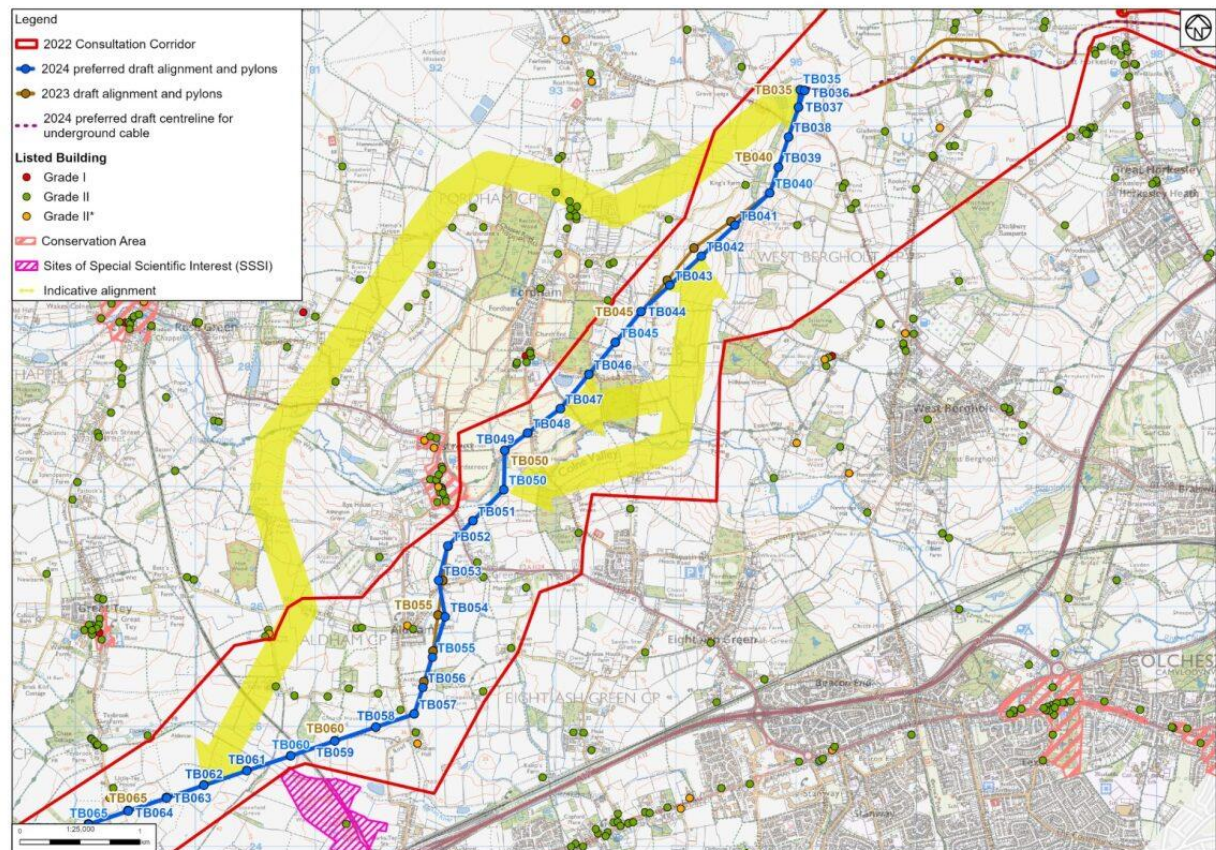
considered that any effects on the AONB in terms established in NPS EN-5 section 2.9 do not occur at a level that would be considered to meet a threshold justifying the effects and additional cost of additional 800 m of underground cable. In reviewing the previous decision making, no new material considerations nor change to factors considered has been identified. As a result, it is considered that the additional costs and effects to extend the underground cable to a different CSE compound location are not consistent with policy. In light of this and the transfer of effects to other receptors no change is currently proposed.

- 5.4.135 At the current time no trenchless crossings are proposed on this section of underground cable. However, in response to feedback, the construction swathe has been restricted in the area south of Knowles Barn and to the west of London Road. It is proposed to restrict construction to only the southern arm, where the corridor was split into two arms in the 2023 preferred draft alignment. This positions the construction swathe between belts of trees running east to west. This restricted width necessitates the temporary use of greater areas of farmland to east and west of the area but avoids the potential for interaction with a private garden associated with Knowles Barn. It also reduces the potential effects on the tree belts to north and south of this section.

Great Horkesley to Little Tey – Section D

- 5.4.136 Consideration has been given to an alternative alignment suggested in feedback to pass to the west of the villages of Ford Street, Fordham and Aldham to reduce potential effects rather than remaining on the 2023 preferred draft alignment that passes to the east (see Figure 5.20). A provisional alignment, based on an indicative sketch provided in feedback, was developed applying the same route development approach underpinning the 2023 preferred draft alignment. The alternative would commence at the western Great Horkesley CSE compound heading south-west then west passing just to the south of Houd's Farm. It would then turn southwards to pass between Hemp's Green and Sutton's Farm, then continuing to the west of Penlan Hall and Oak Farm, crossing the A1124 between properties at Braeburn and White Acres. It would then route to the east of Wick Farm and Hoe Wood, and west of Hoe Farm before crossing the railway and connecting to the 2024 preferred draft alignment around TB063.
- 5.4.137 In comparison with the 2023 preferred draft alignment it is considered that there would be a transfer of effects from receptors in Aldham, Fordham and Ford Street to other, more dispersed receptors in the west. The western alternative would be around 0.6 km longer, with an estimated additional 3 pylons and 3 additional angle pylons, therefore overall, it would be a less economic alternative. Both options would cross the Colne Valley and its associated flood zone (the western option where the flood zone is about twice the width) though it is likely that micrositing of pylons can be utilised to avoid these zones. More residential properties are located around the western crossing which may limit siting given the approaching alignment from the north.
- 5.4.138 Whilst proximity of the western alternative to Wormingford Airfield is noted, the runway orientation and likely distance from the alignment are considered to reduce the potential for the Project to have effects on flight activity. These would however be considered to be greater than on the 2023 preferred draft alignment to the east given the closer proximity.

Figure 5.20 Alignment at Fordham and Aldham



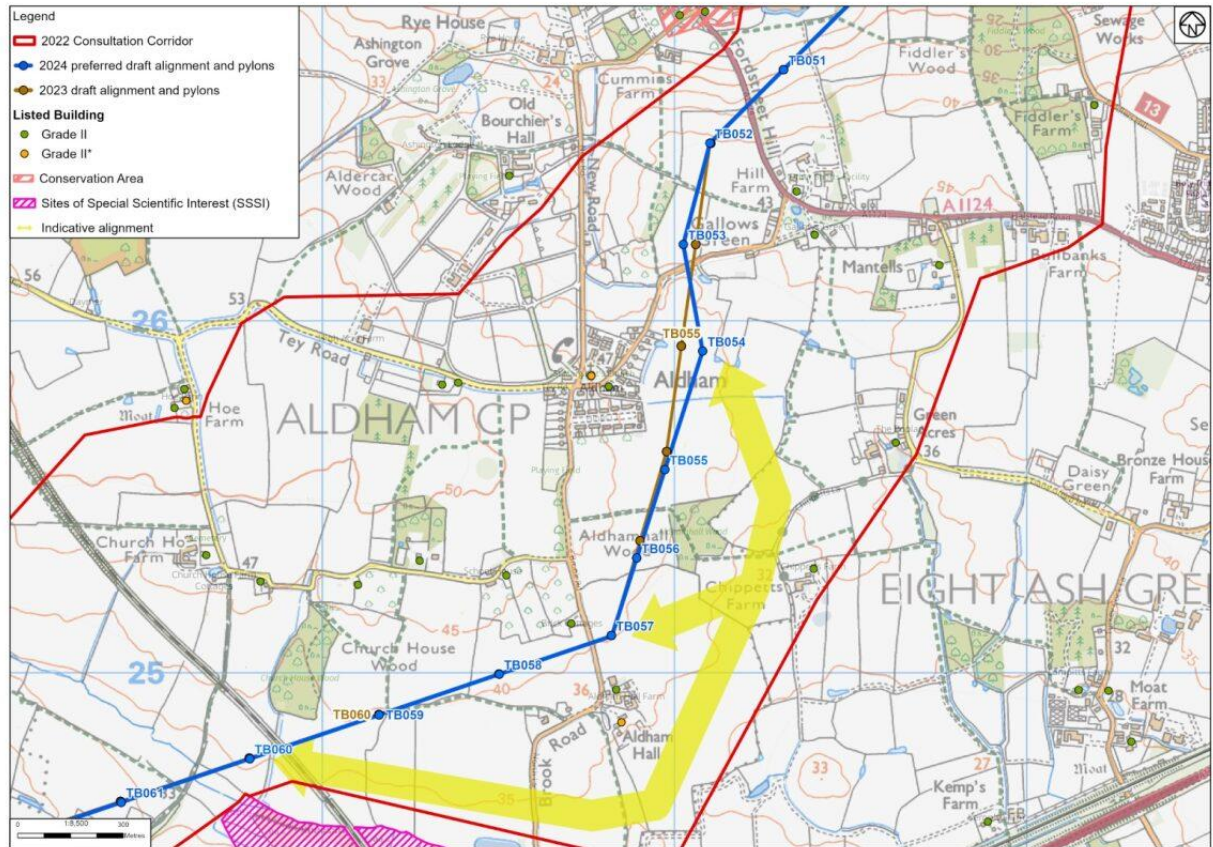
- 5.4.139 Visual effects are anticipated on both alignments. there are more residential properties within 200 m of the 2023 preferred draft alignment (estimated at 49 compared with an estimated 28 for the western alternative). The majority of the 49 are concentrated at Aldham, compared with the more dispersed pattern for the western alternative. When considering proximity to residential properties, where there is no intervening property between them and the alignment, the difference narrows to an estimated 36 on the 2023 preferred draft alignment compared with 28 on the western alternative. Individual property orientations, landform and existing vegetation will influence the level of effects.
- 5.4.140 Both alignment options would also have landscape effects. The landscape of the River Colne and its tributaries has a number of valued attributes which together increase the sensitivity of the landscape to an overhead line. These attributes include the undulating and sometimes steep topography of the valley sides, frequent tree cover including riparian vegetation along the river and its tributaries, open access land and opportunities for recreation. The 2023 preferred draft alignment would traverse a localised ridge to the east of Fordham which would conflict with landform and to the south would also cross the Colne Valley where landform is relatively steep and there is a concentration of PRoW and open access land. In addition, mature tree cover associated with the river corridor and areas of recently planted trees on Woodland Trust's Fordham Hall Estate would be affected. The western alternative would likely have an overall lower landscape effect. There would be less conflict with landform and tree cover and this alternative would cross the Colne Valley in a location where there is slightly reduced recreational value in terms of less dense of PRoW and avoiding open access land.
- 5.4.141 Ecological effects are anticipated on both alignments, and neither are considered to be inconsistent with planning policy or other ecological legislation (e.g. The Wildlife and Countryside Act), though the western alternative would have lower effects particularly by

avoidance of albeit small areas of newly planted woodland on the Woodland Trust's Fordham Hall Estate.

- 5.4.142 Both alignments are likely to result in effects to all grades of listed buildings. There are a similar number of listed buildings overall on the 2023 preferred draft alignment as on the western alternative. However, the western alternative passes the Grade I Listed Crepping Hall at approximately 400 m distance (other residential properties restrict increased separation from the Hall) and passes this distance or closer to several non-designated moats (Crepping Hall, Hoe Farm, Houd's Farm amongst others). All but one of these moated sites are associated with listed buildings, which increases their value over non-designated moated sites not associated with listed buildings. In comparison with the 2023 draft alignment the concentration of moated sites either side of the western alternative is much greater leading to a much greater impact through change to setting affecting the value of designated heritage assets than the 2023 alignment.
- 5.4.143 Overall whilst noting some potential for a reduction in the number of residential properties with potential amenity effects if the western alternative was taken forward, this would be a longer less economic and efficient route with more pylons and angle pylons. It would also potentially increase effects in respect of construction within a flood zone (but subject to micro-siting this difference may be avoided) and be likely to increase effects on heritage assets including a Grade I listed building and several moats associated with listed buildings. It is also noted that the 2023 preferred draft alignment is consistent with policy and overall, it is considered that there would be insufficient benefits from potentially reduced residential amenity and landscape effects of the western alternative to offset the technical concerns and additional infrastructure required for delivery of it. On that basis the 2023 preferred draft alignment, subject to localised modifications, remains preferred and has been taken forward as the 2024 preferred draft alignment.
- 5.4.144 In response to feedback, other localised alternatives over shorter parts of the 2023 preferred draft alignment have also been considered (also shown on Figure 5.20). These included more easterly crossings of the Colne Valley, including paralleling Fossetts Lane, and crossing south of Watercress Hall. On review it was identified that all such alternatives were substantively constrained to the south of the River Colne due to restrictions presented by residential properties around Fordham Heath and Eight Ash Green, and Fiddlers Wood Ancient Woodland. There are particular constraints at Fordham Bridge where the combination of utility infrastructure, ancient woodland, flood zone and watercourse are considered to preclude overhead line routeing. On this basis these more easterly alternatives were not preferred and were not taken forward.
- 5.4.145 Feedback also repeated previous suggestions for the crossing of the Colne Valley to be made by underground cable. No new material considerations or new or amended factors have been identified with the exception of the updated NPS EN-5 (January 2024). This provides the policy framework guiding decision making on the use of underground cable outside designated areas and has informed the completion of the backcheck.
- 5.4.146 The valley of the River Colne was previously identified in local planning policy as a proposed Countryside Conservation Area, though this local designation no longer exists within planning policy. The relevant part of NPS EN-5 is paragraph 2.9.23 and subsequent guidance on decision making. Whilst noting the potentially higher relative landscape value and sensitivities there are limited other factors relevant to decision making around the valley. As such National Grid does not consider, in the context of planning policy, that the potential effects of an overhead line are such that they justify the additional cost and environmental effects associated with the use of underground cable, even if restricted to around a 1 km section centred on the crossing of the River Colne.

- 5.4.147 To address other effects, such as potential effects on residential amenity at Aldham, would require an extension of the underground cable section crossing the valley to around a minimum of 2.5 km, and potentially further, subject to siting to the north of the valley. It is National Grid's view that an overhead line is not inconsistent with policy in NPS EN-5 and from this it follows that it is not considered that the combination of effects in this area justify the additional costs and effects associated with adopting underground cable. On this basis the connection is being taken forward as an overhead line in this area.
- 5.4.148 Responding to feedback to avoid a newly constructed private reservoir, a minor adjustment of the 2023 preferred draft alignment is proposed between TB041 to TB045 (2024 identification as TB040 to TB044) by moving the angle pylon position. This slightly increases separation to and reduces residential amenity effects on residential property at Fordham Place Cottage.
- 5.4.149 As noted above, the preferred arrangement in the vicinity of Fordham and Aldham continues to be an overhead line connection passing to the east of the villages. In response to feedback to reduce residential amenity effects to residential properties at Aldham however an alternative alignment with modified pylon positions between TB053 and TB058 (identified as TB052 to TB057 in 2024) to increase separation was considered. This requires the introduction of an additional angle pylon and the swop of TB56 and TB54 (as numbered in the 2023 preferred draft alignment) to suspension and angle pylons respectively. Adopting the alternative would increase separation between pylons and the nearest property, from around 75 m (to a suspension pylon in the 2023 preferred draft alignment) to around 140 m (from an angle pylon on alternative) at TB055 (as referred on the 2023 preferred draft alignment) and from around 80 m (to an angle pylon in the 2023 preferred draft alignment) to around 120 m (to a suspension pylon on the alternative) at TB056 (2023 preferred draft alignment). On balance the slightly reduced effects from the alternative are preferred and have been taken forward in the 2024 preferred draft alignment.
- 5.4.150 A number of alternatives to divert the alignment to pass to the east and south of Aldhamhall Wood by extending the alignment on from TB053 to TB054 by around two or three spans were considered (see Figure 5.21). These included reconnecting at TB057 (approximately 300m longer with one additional pylon required and one more angle pylon) and further alternatives passing to the south of Aldham Hall (approximately 600 m longer with two additional pylons required and two more angle pylons). Whilst noting that the alternatives all reduce proximity to a number of residential properties at the south-east corner of Aldham (noting most views are side views), effects are transferred to some degree to others further to the west and particularly to Chippetts Farm which is also a Grade II listed building. This would have open views of a nearby pylon and approaching alignment.
- 5.4.151 On balance given the longer alignment and increased heritage effects these alternatives were less preferred.

Figure 5.21 Alignment at Aldham

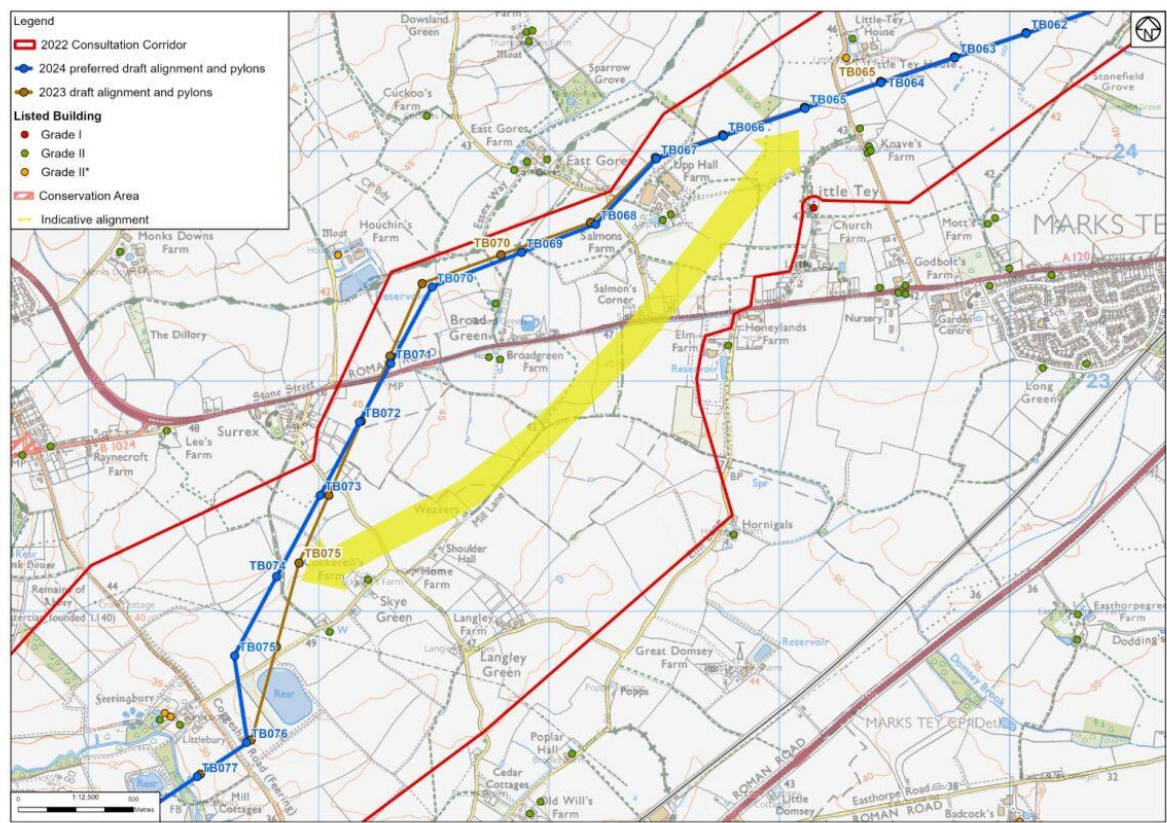


Little Tey to Rivenhall – Section D and Section E

- 5.4.152 The alignment starts within Section D before crossing into Section E around the crossing of the A120 near Surrex.
- 5.4.153 Feedback restated the potential interaction between the 2023 preferred draft alignment and land under option for housing development to the north and southwest of Marks Tey.
- 5.4.154 The land to the south-west is only crossed at its western most extent where previous feedback has indicated the alignment may well coincide with green space or have least interaction with potential built development. The northern site would be crossed around two thirds of the way up the site but again the extent of any interaction is unknown. Experience does show that there is the potential to integrate the Project with green space within similar developments.
- 5.4.155 As is noted in paragraph 5.4.4 only those developments that have reached a particular stage in the planning process have been considered. At this stage neither of these areas have reached a degree of planning status at which they would be considered as influencing factors and no change to the 2023 preferred draft alignment is therefore proposed.
- 5.4.156 Other feedback proposed an alternative routeing to the south side of Upp Hall Farm (see Figure 5.22), which would be from around TB065 (on the 2024 draft alignment). This alternative would increase effects on the Grade I Listed Church of St James at Little Tey and has potential to increase effects on residential amenity by adopting a crossing point where the separation to properties is reduced compared with the 2023 preferred draft alignment. For these reasons this alternative is less preferred and routeing to the north side of Upp Hall Farm has been retained within the 2024 preferred draft alignment.

5.4.157 The 2023 preferred draft alignment has however been slightly modified from where it passes Upp Hall Farm and onwards to the south to respond to feedback to reduce oversail of a carp fishery (oversailed by the span between TB076 and TB077 in the 2023 preferred draft alignment and now adjacent to TB075 in the 2024 preferred draft alignment). The 2023 preferred draft alignment may have restricted fishing on potentially upto half the lake depending on final alignment. Additionally, feedback also requested that National Grid seek to either position pylons on field boundaries or sufficiently clear of the field boundaries so as not to impede farm equipment. An alternative alignment was developed which changes the alignment to pass to the west of the fishing lake avoiding oversail and thus not restricting fishing. This moves TB075 and TB076 (as identified on the 2023 preferred draft alignment) further from and closer respectively to residential properties though separation of around 250 m is still achieved from the closest. On balance the alternative is preferred and has been taken forward in the 2024 preferred draft alignment.

Figure 5.22 Alignment at Little Tey

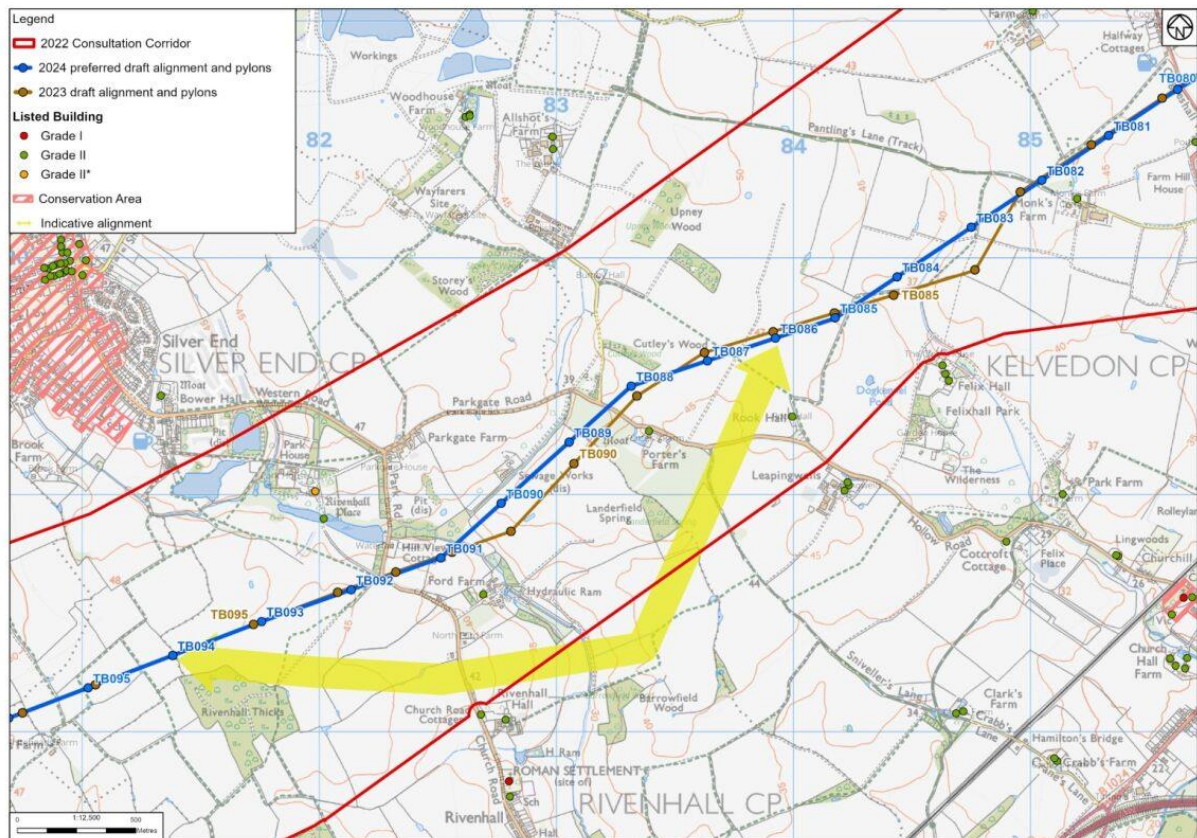


- 5.4.158 After crossing the A120 the Project moves into Section E. Feedback also requested avoidance of oversail of land subject to a change of use from farmland to garden and equestrian land. This would require an additional angle pylon and a larger change of direction and is considered less consistent with Holford Rules and not taken forward.
- 5.4.159 Routing southwards from the now TB075 (on the 2024 draft alignment) has been reconsidered in response to feedback to reduce effects on vine and fruit crops. In the absence of new material consideration or additional factors the outcome, as set out in the 2023 Design Development Report (from paragraph 6.4.112) remains unchanged. Alternatives to north or south of the 2023 preferred draft alignment either increase effects on heritage assets or increase effects on a greater number of existing and planned residential properties. These are therefore less preferred.

- 5.4.160 The position of some pylons within the cropped area has however been modified to position them closer to the edges of fields (albeit not providing a solution entirely avoiding the cropping). Site access elements (bell mouths, access roads etc) have been positioned to reduce the extent of any crop impacts.
- 5.4.161 Feedback also asked for reconsideration of routeing westwards from TB083 (as identified in the 2023 preferred draft alignment) and to adopt an alternative on a straighter alignment to reduce heritage and residential amenity effects. Whilst noting the potential for a change in status of mineral extraction opportunities (National Grid was advised a review may be published in early 2024 but notes this was not available at the time of writing) it is proposed to straighten the alignment at this stage but with extended draft order limits to facilitate realignment should the planning status of the mineral extraction opportunity change.
- 5.4.162 West of this area, feedback requested the 2023 preferred draft alignment be amended to avoid or reduce effects on Ruffian's Wood used by a dog related commercial enterprise (also a Woodland Trust site) between TB088 and TB089 (identified as TB089 and TB090 in 2023). Feedback also requested that the alignment more closely follow the edge of a field to the southwest of Ruffian's wood.
- 5.4.163 Alternative alignments to avoid the wood entirely, by routeing either to the north side or south side, were considered but are both longer and less direct. They would result in the transfer of effects to other similar receptors and for a southern alternative route be likely to increase effects on the Grade II Listed Rook Hall. On this basis these alternatives were considered less preferred and were not taken forward.
- 5.4.164 Consideration has also been given as to whether local adjustments could go some way to alleviating concerns raised in the feedback even though avoidance is not considered achievable. It is now proposed to move around 60m west from the 2023 preferred draft alignment, thereby moving the oversail of Ruffian's Wood away from the centre of the area used by the commercial business. In addition, consideration has been given to construction access routeing (see Section 6) and reducing the period during which construction activities would restrict business activities across part of the site to when vegetation management and conductor stringing activities only are occurring.
- 5.4.165 The change also positions pylons in the section to the southeast of the wood closer to the field boundary going some way to respond to feedback. Placing the pylons directly on the field boundary would require the introduction of two additional angle pylons, lead to greater loss of trees (overall therefore being less consistent with the Holford Rules) and lead to oversail of a road junction which presents greater risk to construction and maintenance activities to install protection to keep the roads open. This is therefore less preferred.
- 5.4.166 The realignment to the south-west of Ruffian's Wood also facilitates a response to feedback about the proximity of TB093 (in the 2023 preferred draft alignment) to a residential property on Park Road to the north of the pylon. With the change of alignment, it has been possible to increase the separation from the property to the nearest pylon from just over 80 m to around 200 m, by moving pylons along the alignment.
- 5.4.167 A further alternative raised in feedback (see Figure 5.23) to move the alignment (at TB92 to TB93 on the 2023 preferred draft alignment) slightly further south has also been considered. With the 2023 preferred draft alignment this would have added a number of additional angle pylons to route around various residential properties and was less preferred for this reason. The change to the 2023 preferred draft alignment makes the requested change easier to achieve by continuing the alignment straight on from TB091

(2024 preferred draft alignment) though it still requires one additional angle pylon to reconnect to the south. This alternative would also transfer effects to a different residential property on Church Road to the south-east and would position a pylon on land proposed for solar panels on the proposed Park Gate solar farm (noting that at the time of writing, confirmation was awaited of a possible appeal to planning refusal). On the basis of the greater effects, mostly related to the solar farm) the alternative is considered less preferred. The proposed draft order limits have however been extended in this location to allow for a further small adjustment to the alignment, which would also allow reduction of effects on a group of trees, should the solar farm not progress.

Figure 5.23 Alignment to east of Rivenhall



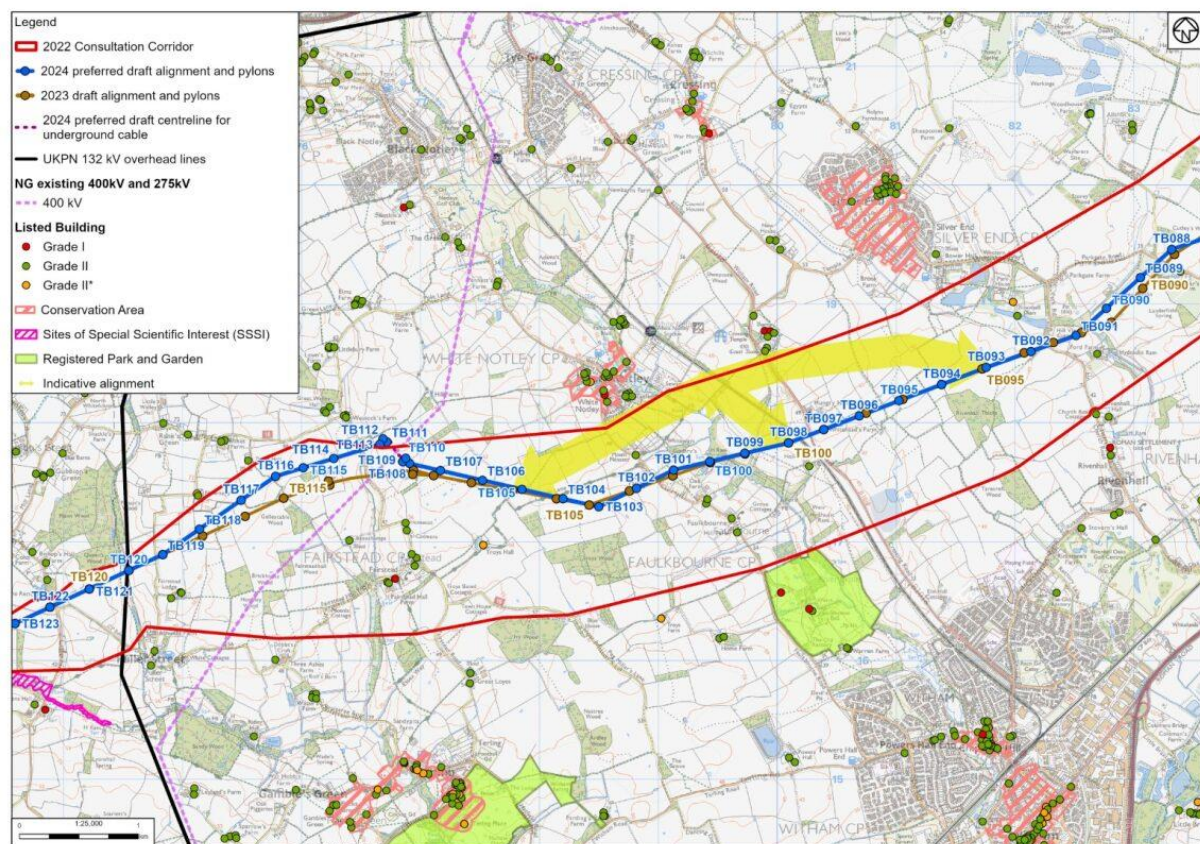
Rivenhall to Fairstead and 400 kV overhead line crossing – Section E

- 5.4.168 Continuing within Section E, feedback from respondents requested consideration of various alternatives seeking to move the alignment further to the north of Faulkbourne (see Figure 5.24), in particular proposing alignments that would pass close to the immediate south of White Notley and / or Crossing Temple. Although there would be a reduction in visual and heritage effects to Faulkbourne Hall and certain residential and / or listed properties from such alternatives, they would also lead to a transfer of effects to other receptors. This includes transferring effects to a greater number of other similar residential properties or heritage assets (including similar grade listed buildings and a scheduled monument) and in some cases were considered likely to lead to a greater magnitude of effect. Alternatives here were also considered to be less consistent with the Holford rules and overall were not preferred.
- 5.4.169 In addition, the potential effects at Faulkbourne were not considered to be inconsistent with policy and therefore do not provide a driver to change what is otherwise a relatively

straight alignment approximately midway between Cressing Temple and Faulkbourne listed buildings.

- 5.4.170 An oversail, by the 2023 preferred draft alignment, of the corner of a pitch (see Figure 5.24) and specifically the western goal posts to the south-east of White Notley has been identified. Whilst any potential microshock risk could have been mitigated through the use of plastic goalposts, it was considered there was a residual concern that future replacements may inadvertently overlook the potential risk. The angle pylon has been moved and is now positioned at TB101 (on the 2024 preferred draft alignment) with the degree of direction change slightly increased to avoid the oversail of the goal (removing the microshock risk) whilst not moving the alignment closer to residential properties to the west side of Church Hill.

Figure 5.24 Alignment at White Notley and Fairstead



- 5.4.171 At the crossing of the existing 400 kV overhead line to the north of Fairstead, feedback requested the repositioning of the western CSE compound, and overhead line routing, to reduce interaction with multiple game shooting drives and reduce potential effects on plantation willow along the floor of a shallow valley.
- 5.4.172 Consideration was given to moving the CSE compound further west (to or beyond TB115 on the 2023 preferred draft alignment) this was less preferred. Whilst such changes would remove the conflict with game shooting it was considered that the increased length of underground cable required (a minimum of around 400 m) and thus increased cost was not justified for the effects addressed nor in line with National Grid's duties to be economic and efficient.
- 5.4.173 A further alternative, moving the 400 kV alignment to the north of woodland at Hallhook Row (north of TB113 to TB115 on the 2023 preferred draft alignment) has been considered, albeit in a slightly modified form to that proposed by a respondent. Although

the feedback suggested moving the CSE compound to the north, there was no appreciable extent of existing screening vegetation. Feedback was however addressed by moving the CSE compound further north-east immediately adjacent to the 400 kV overhead line. This alternative position and associated overhead line realignment further to the north, would avoid the plantation willows and allow both CSE compounds to be positioned within the same field to the east of the shallow valley and Fairstead Road. In this location landform and existing woodland and hedgerow screening, which can be further strengthened, would help to reduce the level of potential effects.

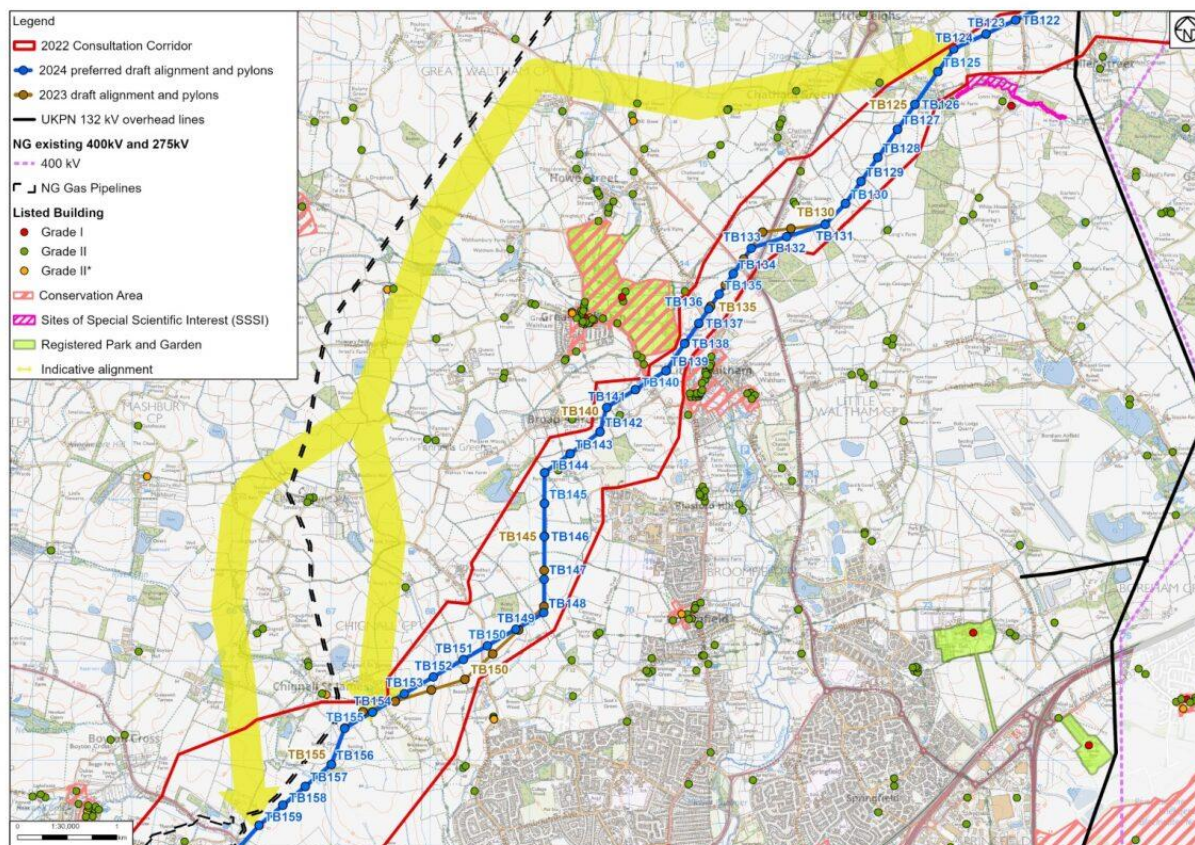
- 5.4.174 This location would also reduce the length of underground cable crossing required, providing a more economical solution, and also reducing the potential for effects to arise from underground cable installation. The alternative does however, compared with the 2023 preferred draft alignment, move the overhead line closer to a residential property (also a Grade II listed building) at Weststock's Farm albeit that there would still be still provides around 300 m separation from the nearest pylon or CSE compound infrastructure. Overall, this alternative, western CSE compound position and associated realignment of the overhead line that continues to the west, is preferred and has been taken forward in the 2024 preferred draft alignment.
- 5.4.175 As a consequence of the repositioning of the western CSE compound, a slight western shift of the eastern CSE compound and overhead line is required between TB105 and TB118 (now identified as TB103 to TB119 respectively in 2024) to optimise the CSE compound positioning and reduce effects.

Fuller Street to Writtle – Section F

- 5.4.176 Section F commences around the point that the alignment crosses the 132 kV overhead line at Fuller Street. As the design for the Project has developed, we have been able to confirm certain arrangements where the Project interacts with the existing 132 kV overhead line network. The usual arrangement is to replace the 132 kV overhead line with underground cable between CSE platform pylons. These CSE platform pylons are provided by re-purposing or new 132 kV pylons positioned to either side of the 400 kV alignment. This arrangement is normally kept as short as technical considerations allow to reduce environmental effects of the underground cable installation and to be as economic as possible whilst achieving safe crossing of this infrastructure.
- 5.4.177 At Fuller Street the 2023 preferred draft alignment would position 400 kV pylons to north and east of the village with additional potential cumulative effects with the 132 kV overhead line to the west. Considering the potential cumulative effects, it is proposed to underground a relatively more extended length of 132 kV overhead line from alongside Mann / Parson's Wood on the north side of the existing 400 kV overhead line to the south of Fuller Street to the south of the existing 400 kV overhead line.
- 5.4.178 Landowner feedback identified aspirations for mineral extraction and housing development to the north of Chelmsford, with sites reported to have been put forward as part of 'calls for sites' in the planning process. A number of alternative alignments were suggested to avoid the areas concerned but all would be longer and less direct than the 2023 preferred draft alignment. All would also increase effects, compared with the 2023 preferred draft alignment, to varying degrees on woodland, residential amenity, and heritage assets. Irrespective of this however, and in line with the approach set out from paragraph 5.4.4, the proposals are not considered (at the 31st December 2023 cutoff date for this report) to be at an advanced enough stage in the planning process to be included as a material factor influencing route development considerations. The alternatives suggested have not therefore taken forward at this stage.

- 5.4.179 Several respondents restated their preference for a more western alternative towards Pleshey (see Figure 5.25) though identified no new factors nor change to material considerations to support their preference. National Grid has backchecked and has considered an alternative that would divert west from around TB124 / TB125 on the 2024 preferred draft alignment passing to the north of Warner's Farm before turning southwards. Routing would be likely to stay to the east of the gas pipeline to maintain separation from Pleshey. Alternatives to pass Chignall Smealey and Chignall St James either to the east or west may be available with a preference to pass to the west as a more direct alignment.

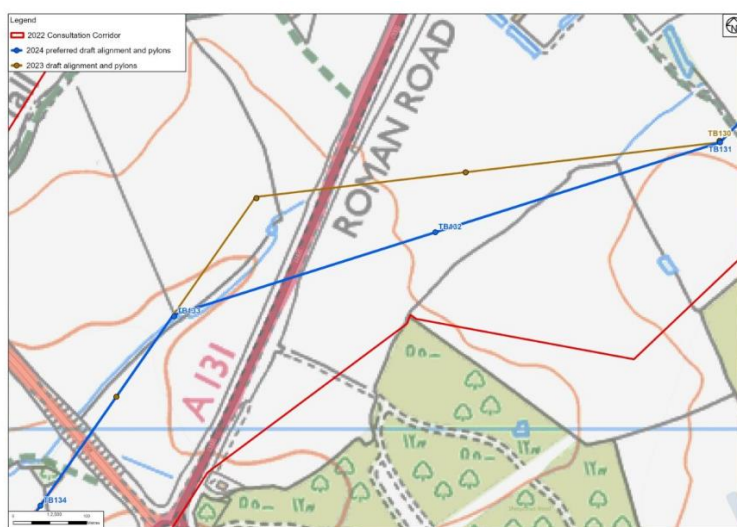
Figure 5.25 Alignment at Great Waltham



- 5.4.180 This more western alternative, regardless of route at the southern end would lead to some transfer of effects on residential amenity. Routing to the southern end of The Crescent near Little Leighs is relatively restricted and would pass at around 100 m from residential properties. In this area the route would also need to cross part of the land used by The Wilderness Foundation for outdoor education including in part for short residential educational camps. Some disruption during construction likely to be unavoidable.
- 5.4.181 The western alternative would also be visible in the open farmland from several residential properties to the west edge of Great Waltham which have open views towards Pleshey, and where there is little in the way of existing screening vegetation.
- 5.4.182 Elsewhere both the western alternative and the 2023 preferred draft alignment would pass relatively close to properties, though many of those in Great and Little Waltham along the 2023 preferred draft alignment would have substantially screened or filtered views. Overall effects on residential amenity are considered to be slightly greater on the 2023 preferred draft alignment.

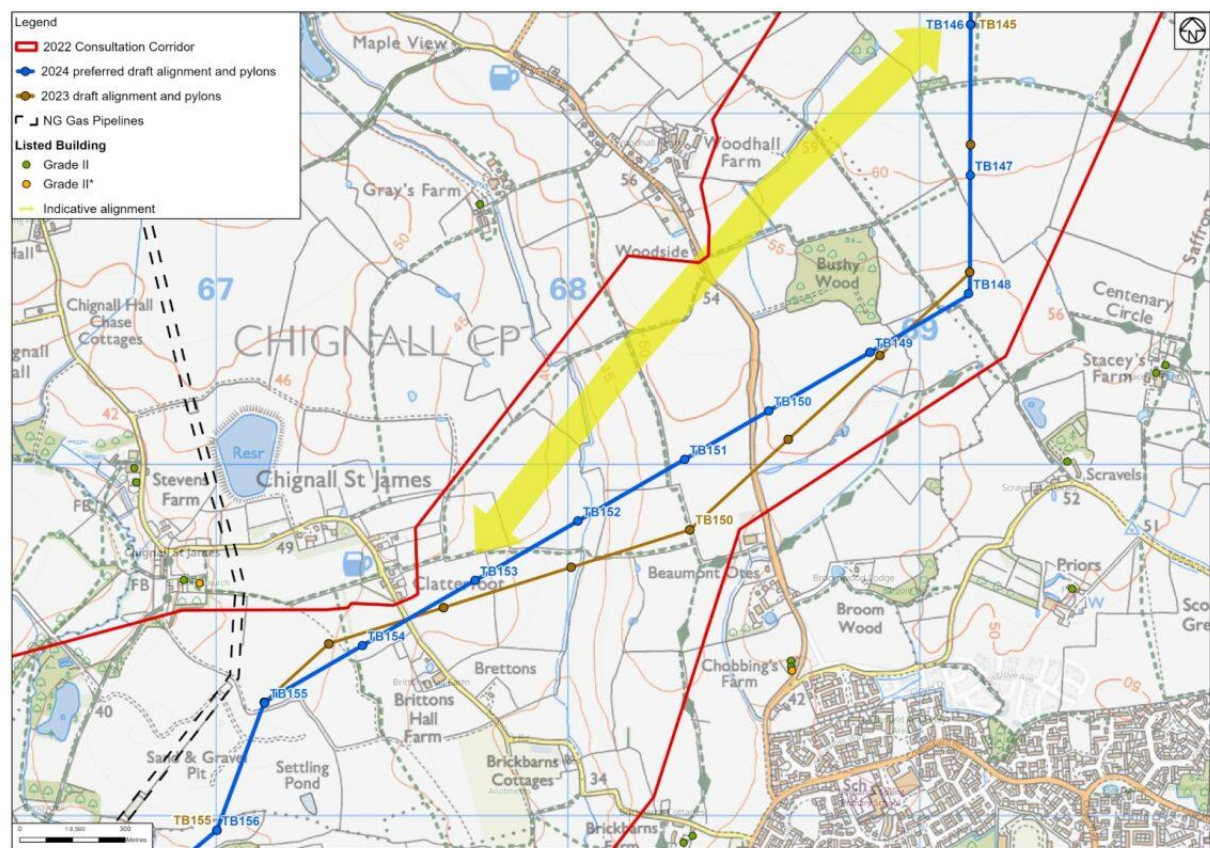
- 5.4.183 The western alternative would offer the opportunity to reduce potential heritage effects as it is routed, at least in the central third, through cropped farmland where there are relatively fewer listed buildings. It would however introduce the potential for additional effects to a scheduled monument east of Howletts and, given the relative openness of views between Pleshey and Great Waltham, may introduce effects to the scheduled monument (motte and Bailey of Pleshey Castle) and listed buildings at Pleshey. The 2023 preferred draft alignment routes between conservation areas and past the eastern edge of the Langleys Registered Park and Garden, though screening by the bypass and from trees would reduce potential effects on Little Waltham. In addition, the trees in the extensive parkland would provide filtering of views at Great Waltham and to direct views from the Grade I Listed Langleys. Overall heritage effects are likely to be reduced with the western alternative.
- 5.4.184 The western alternative would be in the order of 2.5 km to 3 km longer and likely to require an additional 8 or 9 pylons with associated additional environmental effects. It would also require an additional crossing of the gas pipeline and may necessitate additional installation of cathodic protection (trenches adjacent to the gas pipeline need to be dug to install the protection) over several kilometres, leading to additional effects on farming activities.
- 5.4.185 Whilst noting the potential for some reduction to some effects (heritage and residential amenity) from the western alternative, it is noted that the alternative would lead to some transfer of effects from some residential properties to others and would introduce effects and require additional infrastructure over a less direct and longer route.
- 5.4.186 With the potential effects on the 2023 preferred draft alignment not considered to be inconsistent with relevant policies in NPS EN-5 it is considered that on balance the shorter alignment of the 2023 preferred draft alignment is appropriate to take forward into the 2024 preferred draft alignment.
- 5.4.187 Heading onwards from TB130 and the crossing of the proposed Chelmsford Northern Bypass, minor adjustments to the 2023 preferred draft alignment are proposed to reposition the crossing of the A131 (see Figure 5.26) and some pylons to the east of Langleys Park and Garden to seek to reduce pylon heights and position pylons to reduce effects on farming activity, conservation areas, heritage assets and landscape.

Figure 5.26 Alignment at A131 crossing



- 5.4.188 To the west of Broomfield, in response to feedback, the 2023 preferred draft alignment has been straightened between TB148 and TB155 (identified as TB147 and TB154 respectively in 2023) (see Figure 5.27) replacing four angle changes with two slightly greater angle changes.
- 5.4.189 A preference for an alternative alignment was restated by respondents seeking to move the alignment to the north of Bushy Wood by adopting a straight alignment broadly between TB146 and TB153 (on the 2024 preferred draft alignment). This alternative would lead to increased effects on residential properties on Woodhall Hill where separation to the draft alignment would be reduced to around 150 m. Following the straightening from TB147 to TB155 (2024 preferred draft alignment) noted above, separation to properties to the south is currently in excess of 350 m with the separation to the properties to the north slightly greater at around 450 m. A midway alignment cannot be achieved due to the constraint of the ancient woodland at Bushy Wood. In the absence of other or additional factors and no new material considerations being identified it is considered that an alternative to the north of Bushy Wood is less preferred and it has not been taken forward.

Figure 5.27 Alignment north of Broomfield



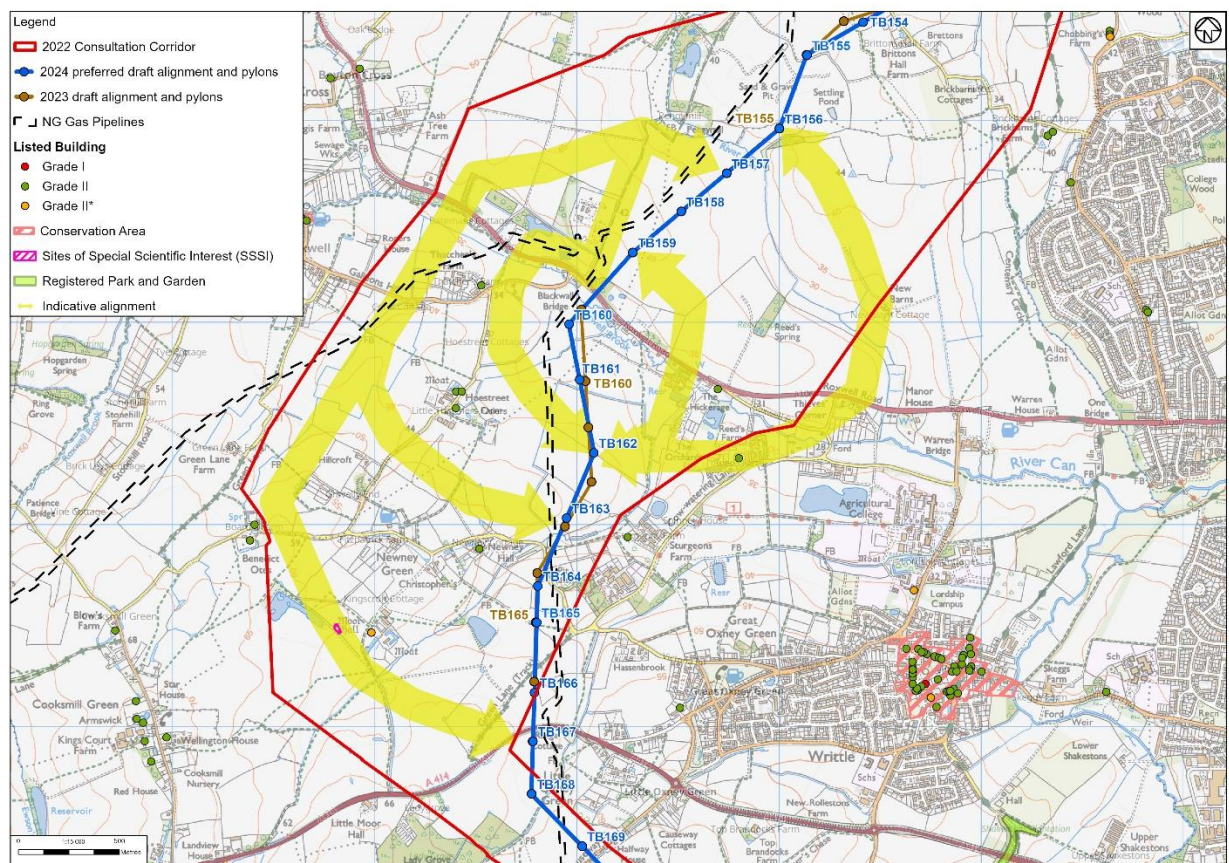
- 5.4.190 Feedback relating to land to the north-west of Writtle (see Figure 5.28), to the south of Brittons Hall Landfill, requested avoiding a site used for a scouting and guiding Jamboree every four years, suggesting it could be addressed by alternatives diverting to either east or west.
- 5.4.191 An alternative diverting to the eastern edge of the site would adversely affect land identified as a Strategic Growth site, as well as having to cross Roxwell Road between The Hickerage and Thieves Corner. At this location changes of direction would be required and the space between residential properties would be considerably reduced.

Effects on residential amenity are therefore considered to be greater than for the 2023 preferred draft alignment. An alternative diverting to the west of the Jamboree site and a gas compressor site was considered in the development of the 2023 preferred draft alignment and has been back checked following feedback. Such an alternative would result in a greater number of properties likely to experience effects on residential amenity than for the 2023 preferred draft alignment and it is therefore less preferred. As the oversail of the jamboree site by overhead line is not considered to be incompatible with its use for periodic jamboree events, and in the absence of other or changed factors or material considerations, it is considered that more eastern or more western diversions are less preferred to the 2023 preferred draft alignment.

5.4.192 Other potential alternatives achieving localised realignments across the Jamboree site to follow the east or west boundaries were also considered. However, these would all be longer, add additional angle pylons and still oversail the site to some degree. On this basis the straighter 2023 draft alignment remains preferred.

5.4.193 Feedback also requested consideration of an alternative deviating from the 2023 preferred draft alignment close to the gas compressor site to pass immediately to the west of the Hare public house. The gaps between properties would however be reduced and there would be a transfer of and increased effects on residential amenity compared with the 2023 preferred draft alignment. Requests for other alternatives further west were also repeated from the 2022 consultation but, as identified in the 2023 Design Development Report these would require much longer routes with greater angle changes and the transfers of effects to a larger number of residential properties. These therefore continue to remain less preferred. On balance therefore the 2023 preferred draft alignment continues to be considered preferable to other alternatives and has been taken forward.

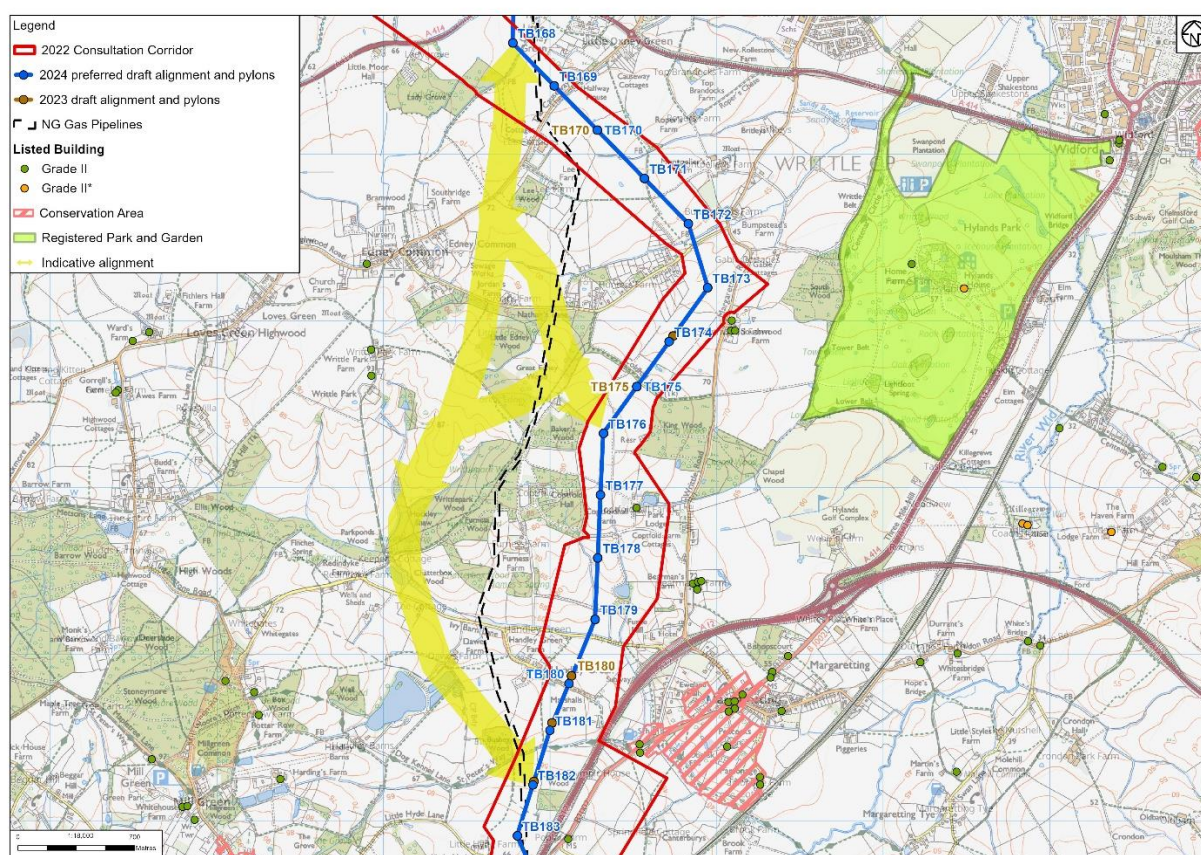
Figure 5.28 Alignment west of Writtle



Writtle to Herongate – Section F and Section G

- 5.4.194 The Project continues in Section F until the crossing of the A12 north of Ingatestone where it moves into Section G.
- 5.4.195 Minor adjustments have been made in the positioning of TB159 to TB164 (2023) now TB160 to TB164 in the 2024 preferred draft alignment. This has increased the distance between TB160 (which has also now moved out of a flood zone) and the nearest residential properties and has also sought, where possible, to position pylons to reduce effects on farming activity, at least partly achieved by removing one pylon.
- 5.4.196 Feedback also requested routing more directly in the vicinity of Edney Common (e.g. TB158 to TB176 or TB182) to reduce effects on farming activity, and potentially also benefitting from routing more extensively in valleys (see Figure 5.29). Feedback emphasised that several areas of Ancient Woodland, that were identified as a main reason for these routes being less preferred in the 2023 Design Development Report, were subject to extended rotation coppice regimes. After reconsideration it has been concluded that the more regular need to control the height of vegetation under overhead lines (requiring coppicing over short rotations) would lead to a change in the habitat. This change is not considered to be compatible with the preservation of the ancient woodland habitat and these alternatives are still considered to be less preferred. As such we are currently progressing with the 2023 preferred draft alignment in this location but with some in line adjustments to pylon positioning.

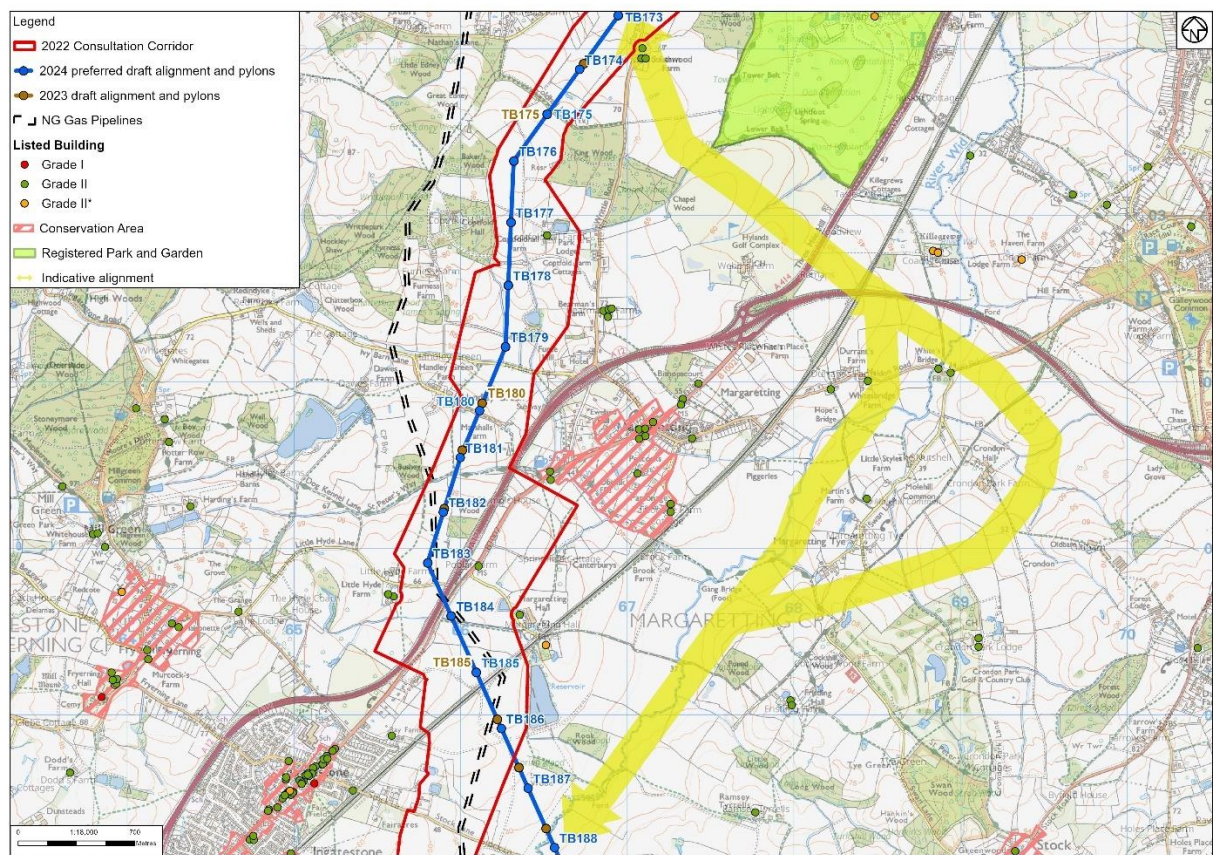
Figure 5.29 Alignment at Edney Common



- 5.4.197 Feedback responses also proposed an alternative alignment to the east of Margaretting (see Figure 5.30). This would be from around TB175 to pass the southern edge of Hylands Park and directly over Hylands Golf Complex. Crossing the rail line to east of the

A12 and A414 junction the alignment would turn south along the east side of the River Wid reconnecting with the 2023 preferred draft alignment to the east of the Church of St Mary at Buttsbury. Localised variations were considered for part of the alternative passing to the east and west of a group of properties located along Swan Lane. Overall, the alternatives would be around 1 km longer, (for the shortest western alternative and longer than a variation passing to the east of Swan Lane) and less direct with a much larger angle change around the A12 crossing. Effects on residential amenity and heritage assets would generally be transferred from receptors around the 2023 preferred draft alignment to receptors on these alternatives. Additionally, there would be increased levels of residential amenity effects for the alternative passing to the west of Swan Lane, as a result of an increased number of properties in closer proximity to potential alignments in the area around Maldon Road and Swan Lane. Due to the increased level of effects and the longer route length these alternatives are less preferred and have not been taken forward.

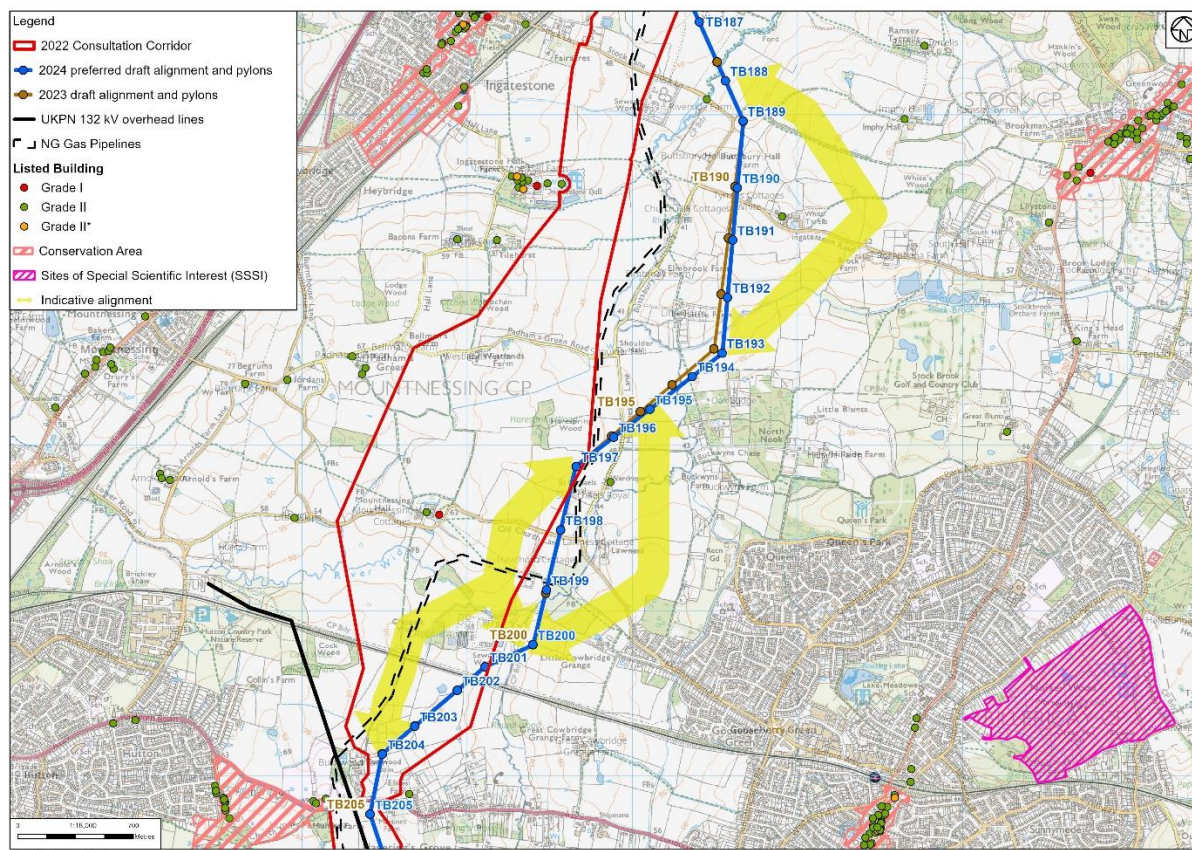
Figure 5.30 Alignment at Margaretting & Ingatestone



- 5.4.198 The Project moves into Section G around the crossing of the A12 to the north of Ingatestone.
- 5.4.199 Consideration of feedback and further technical review have led to a slight shift eastward in the alignment (see Figure 5.31) between TB189 and TB197 (identification unchanged since 2023) to reduce oversail of an animal rescue establishment and avoid the placement of pylons within flood risk areas. The potential for interaction with Napps Field Airfield (also referred to as Brock Farm) was also identified by respondents but, through engagement with the landowner, it has been identified that this airfield is no longer operational, and the owner has no current plans to restore flight activities.

- 5.4.200 Respondents also sought consideration of alternative alignments further to the east, in the vicinity of White Tyrrells, partly from landowner perspectives but also to increase the separation from the Grade II* Listed Buttsbury Church. Such changes would reduce heritage effects but would transfer effects to other landowner receptors. It would also be requiring a less direct and longer route with additional pylons and would increase effects on residential amenity to those on the western edge of Stock. Overall, given the transfer of effects and increased length and number of pylons, it is considered that a change would be less consistent with the Holford Rules and therefore it was less preferred, and no change is currently proposed.
- 5.4.201 Conflicting feedback was provided for the section to the east of the Grade I Listed St Giles Church (see Figure 5.31) with respondents seeking to reduce residential amenity effects or reduce effects on an area recently planted with saplings as part of restoring wildlife interest. Some respondents proposed a move of the 2023 preferred draft alignment further east but this is considered less preferred, as while there would be some benefit to individual residential amenity, there would be a transfer of effects and an increase in such effects to a larger number of residential properties on the western edge of Billericay.

Figure 5.31 Alignment at Stock



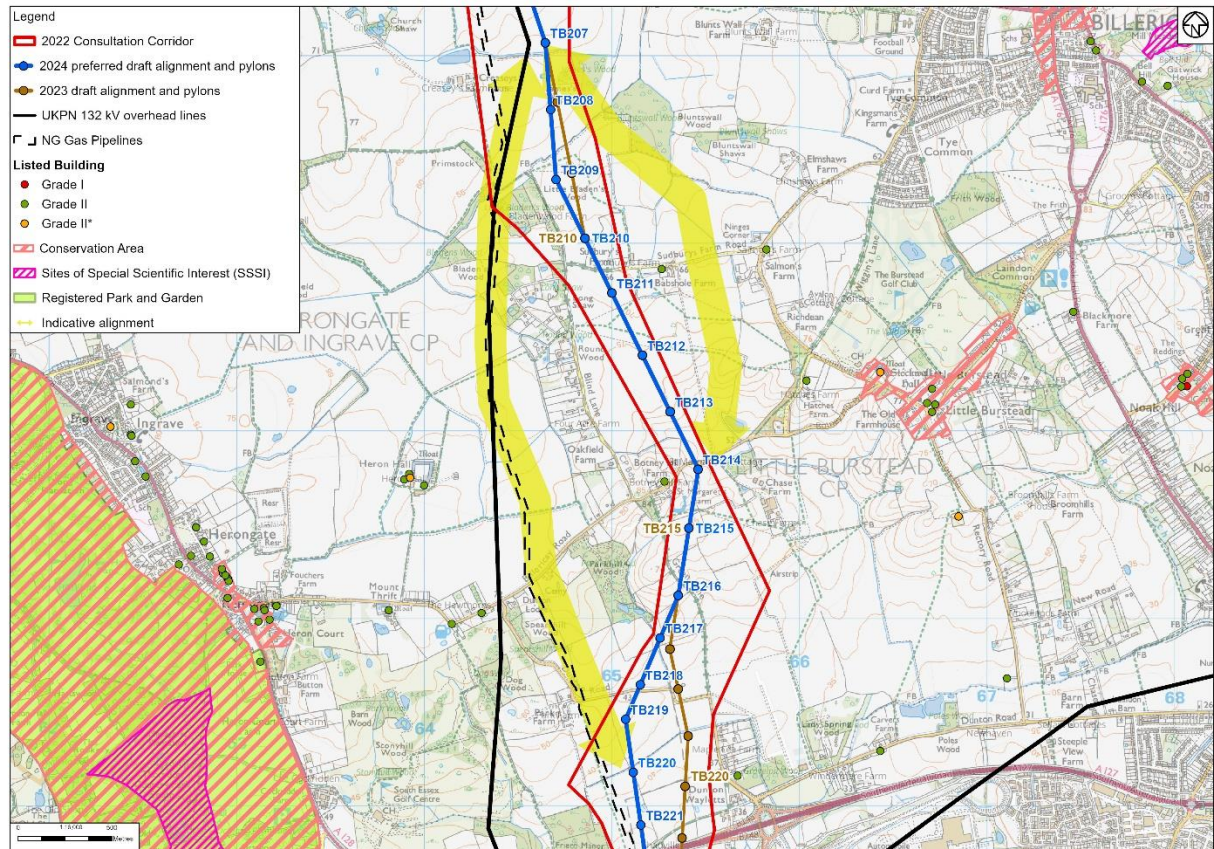
- 5.4.202 Other respondents proposed alternatives to address the potential effects that sought to move the alignment further to the west (closer to, but still to the east of St Giles Church) encompassing various routes past the Wastewater Treatment Works (WwTW). Alternative routes over the WwTW are not viable as they would interfere with the essential need for cranes to be used on the site. Alternative routes to the west of the WwTW would position pylons much closer to the Grade I Listed St Giles Church and impacting the setting of the Church. These alternatives are therefore considered less preferred. Alternative routes close to the western edge of the WwTW would also unavoidably affect areas of ancient woodland and are therefore also less preferred.

- 5.4.203 A further alternative continuing southwest from TB197 and passing to the west of residential property and the gas installation before turning to pass to the east of the WwTW reconnecting with the 2023 preferred draft alignment around TB200 was also considered as a hybrid option. Whilst this would avoid the removal of the recently planted trees, it would result in increased heritage effects, when compared with the 2023 preferred draft alignment, as a result of reduced separation from the Grade I Listed St Giles Church, with a less direct alignment with more angles and greater direction change particularly at TB200. Taken together this alternative was considered as less preferred.
- 5.4.204 No change to the 2023 preferred draft alignment in this area has therefore been taken forward.

Herongate to South of Dunton Hills Garden Village – Section G

- 5.4.205 Continuing in Section G, feedback requested avoidance of the pinchpoint to the west of Havering's Grove around TB205 but without defining a specific alternative. This is not possible however due to the extent of urban areas (Billericay, Hutton, Brentwood amongst others) to the east and west restricting options for routeing to Tilbury. No change is proposed in response to this feedback.
- 5.4.206 Feedback also suggested an alternative for routeing at the pinchpoint by adopting the route of the 132 kV overhead line (replacing the 132 kV overhead line with an underground cable) (see Figure 5.32). Whilst the potential for this to reduce residential amenity effects around this location is noted, this would be as a result of either increased ecological effects, due to the requirement for a swathe of tall vegetation to be cleared through woodland or would require oversail of the Woodland School grounds. The adoption of the alignment of the 132 kV overhead line are considered less preferred to the 2023 preferred draft alignment.
- 5.4.207 A conclusion has not yet been reached as to whether the cumulative effects on residential amenity, to the residential properties at and on the road to Bushwood Farm, of a 400 kV overhead line to one side and the 132 kV overhead line to the rear necessitate consideration of any additional mitigation. This could potentially include replacement of the 132 kV overhead line by underground cable.
- 5.4.208 South of Herongate, feedback requested consideration of alternatives that either adopted or close paralleled the existing 132 kV overhead line that passes to the west of Blind Lane. As shown on Figure 5.32, respondents cited in particular their opinion that there was space to the western side of the Herongate Woodland Cemetery that could be used for the 400 kV routeing. This suggestion has been reviewed however the perceived space, adjacent to the western side of the cemetery, has been identified as being occupied by a high-pressure gas pipeline with space further restricted by an adjacent residential property. The particular arrangement of the gas pipeline and residential property, along with areas of woodland, is such that an alignment for a 400 kV overhead line cannot completely avoid oversail of the cemetery area. This is not considered to be consistent with the Holford Rules and planning policy and is therefore less preferred.
- 5.4.209 The alternative to adopt or closely parallel the existing 132 kV overhead line, which is positioned slightly further west of this, is also restricted by various environmental features and constraints. To the west of the woodland cemetery the 132 kV overhead line passes between residential properties. The larger scale 400 kV infrastructure is more likely to oversail in this location. It would also lead to effects on the South Essex Golf Centre and lead to increased effects on the scheduled monument 'Moated site east of Heron Hall'. For these reasons it is considered that an alternative adopting or closely paralleling the 132 kV overhead line is less preferred.

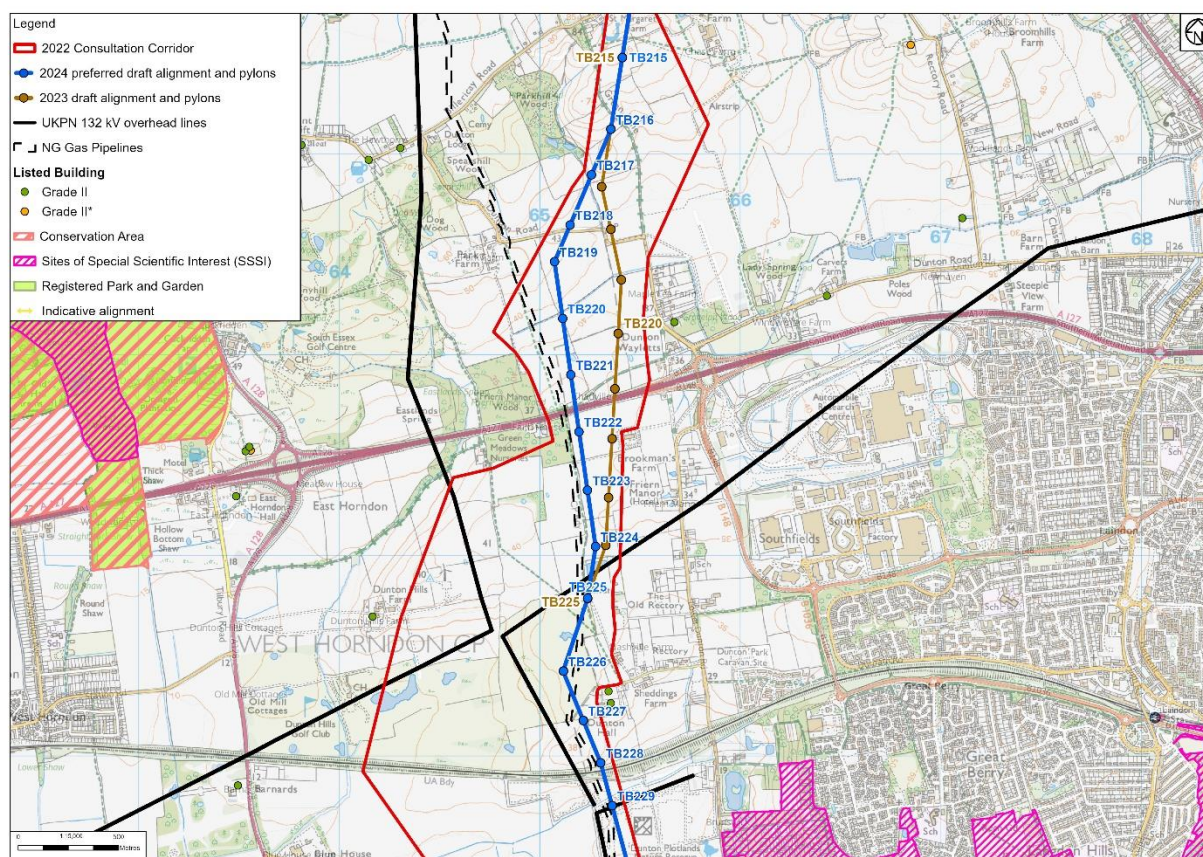
Figure 5.32 Alignment at Herongate



- 5.4.210 In response to localised feedback to seek to reduce effects on residential amenity in the vicinity of TB210, the angle pylon to the north has been moved by one span, to TB209. Although the position of TB210 has not changed the larger angle pylon has been moved further from the closest residential properties.
- 5.4.211 Feedback also identified additional housing proposals to the east of Dunton Hills Garden Village, with part of the proposals to the west of the gas pipeline and a larger part to the east. Based on an indicative masterplan provided in the feedback, the proposals would be potentially impacted by pylons TB221 to TB224 within the 2023 preferred draft alignment (see Figure 5.33).
- 5.4.212 An opportunity has however been identified that would reduce interaction with the Dunton Hills Garden Village proposals. This would assist with reducing the effects on the proposals to the east of the garden village site as the indicative masterplan also shows the provision of a corridor formed by the Building Proximity Distance (BPD), which provides a safety zone around the gas pipeline, to be kept free from occupied buildings. An alternative to follow this corridor would reposition the 2023 preferred draft alignment northwards from TB225 to closely follow the gas pipeline and would route within the safety zone. The zone restricts the new development to being in the order of 80 m distant from the pipeline (the BPD has been confirmed with Gas Transmission and Distribution who are the owner and operator of this pipeline). This alternative would increase the potential for interaction with the Park Farm Solar development though through detailed engagement and micro-siting it is considered that the potential loss of panels can be minimised. On balance this alternative is preferred and, subject to detailed design outcomes, we would expect loss of developable land to be minimal and effects arising from proximity being reduced through design orientation and planting.

- 5.4.213 As a consequence of the change described above, the connection to the north back to the 2023 preferred draft alignment is realigned to the north of the A127 around TB216. This allows some repositioning of the alignment to seek to reduce the interaction with flight activity at Chase Farm airstrip. Even with the realignment some interaction with flight activity remains and requires consideration of additional measures to allow future use. National Grid is continuing to engage with the airstrip operator to seek to identify an appropriate solution.
- 5.4.214 Feedback has also requested consideration of underground cables through the Dunton Hills Garden Village development area. The route of any cable connection would be likely to have to adopt the 2023 preferred draft alignment to cross the A127 as there is insufficient space for the majority of the required cable trenches between a residential property and the gas pipeline to allow for trenchless crossing for all the cables. Even if realigned to subsequently follow the gas pipeline safety zone it is estimated that between 2 to 3 hectares of development land would be removed (as no development could occur above the cables). Given the absence of a clear basis in NPS EN-5 for the use of underground cable in this location (it is not subject to designation as AONB or similar), the ability for detailed masterplanning to reduce potential visual effects and the additional cost implications of the additional cable (of around a minimum 2 km), and the potential loss of development land National Grid does not consider it necessary to change from overhead line for the 2024 preferred draft alignment in this location.

Figure 5.33 Alignment at Dunton Hills Garden Village



Dunton Hills to Lower Thames Crossing – Section H

- 5.4.215 The Project crosses into Section H at the railway line to the south of Dunton Hills Garden Village. South from Dunton Hills no substantive modifications to the 2023 preferred draft alignment or pylon positioning have been made.

- 5.4.216 Feedback suggested continuing the parallel arrangement with the 132 kV overhead line in the vicinity of Langdon Hills Golf Course where the 2023 preferred draft alignment deviates from a parallel arrangement between TB235 and TB243. This alternative parallel arrangement has been considered but it has been concluded that this would conflict with continued flight activity at Thurrock airstrip to the west. It was therefore less preferred.
- 5.4.217 We have continued to review the 2023 preferred draft alignment following engagement with the airfield and some in-line modifications have been made to the proposals. Pylon separation has been reduced (by introducing an additional pylon between TB235 and TB240) to keep pylon heights lower and, by maintaining the positioning closer to Langdon Hills Golf Course, flight activities at Thurrock can continue.
- 5.4.218 In this area towards the southern corner of the golf course, feedback suggesting crossing pipelines at closer to a right angle was also considered. This would require more, and sharper, angles (potentially leading to conflict with Thurrock Airfield activities) and it is considered that concerns relating to more oblique crossings can be addressed through other mitigation measures (including the installation of cathodic protection) to protect the pipelines. On balance therefore the 2023 preferred draft alignment has been taken forward with its fewer and less sharp changes of direction.
- 5.4.219 Respondents also requested consideration of alternative alignments so that the alignment between TB248 to TB254 be moved to pass to the west, either to follow the 132 kV overhead line, or alternatively, to pass to the western side of Saffron Gardens, noting that Cholley's Farm (a Grade II Listed building) was in their opinion derelict. In the absence of new evidence, the reasons for not preferring a route close to or adopting the 132 kV overhead line, as set out in the 2023 Design Development Report, which are that there is insufficient space between residential properties as well as constraints from previous minerals and landfill workings and the routing of a gas pipeline, remain valid. On this basis this alternative is less preferred, and this requested change has not been progressed.
- 5.4.220 A proposed alternative to the west of Saffron Gardens was also considered. It was identified that routing would be constrained by the presence of a gas pipeline which would necessitate potential alignments that were either closer to areas of residential properties and listed buildings, such as Saffron Gardens, or would require the use of multiple angle pylons to achieve similar separation as the 2023 preferred draft alignment. It would also require a very substantial angle change at around TB253. Overall, these western alternatives are considered less consistent with Holford Rules and have not been taken forward.
- 5.4.221 Wider draft order limits are proposed around Buckingham Hill Landfill in response to feedback from respondents to seek to avoid Maple Park (moving TB256 and TB257 to the west of the road). Investigations and engagement with respective landowners continue to identify an appropriate balanced solution, pending confirmation of potential SSSI designations, built development proposals at Southfields and ground conditions. Some interaction with the southern end of the Southfields development opportunity site cannot be avoided, given the absence of alternative alignment options. However as at Dunton Hills, the routing of a high-pressure gas pipeline and its associated safety zones provides an opportunity to minimise interaction between the Project and the potential for development of this site.

Lower Thames Crossing to Tilbury

- 5.4.222 No substantive changes to the proposed CSE compound siting or underground cable corridor for the connection through to Tilbury Substation are proposed however the draft order limits have been expanded to support all reasonably likely outcomes from ongoing discussions with landowners and other development promoters regarding the integration of proposals most efficiently and economically.
- 5.4.223 The most appropriate means of connecting into Tilbury Substation itself has been identified as to build new infrastructure within the western half of the site on existing operational land. This avoids the need for additional land take thus reducing potential interaction with other development proposals but requiring the underground cable to be routed amongst existing pylon bases to the north of the substation, between it and the generating station and battery storage just to the north.

5.5 400 kV Permanent Works Summary

- 5.5.1 In summary the changes and modifications outlined above lead to an aggregated position for the project (excluding the Waveney Valley Alternative) of:
- Total route length approximately 184 km;
 - Total overhead line length approximately 159 km;
 - Total underground cable length approximately 25 km; and
 - Six CSE compounds.
- 5.5.2 As set out in the preceding text there has been an increase in underground cable length at Raydon with a slight reduction at Fairstead. However, the total length of undergrounding has remained at approximately 25 km as a result of remeasurement and excluding split underground cable corridors. For example, the CSE compound positions and underground cable alignment at Great Horkesley have not changed, however the end-to-end length (encompassing all corridors) has reduced from the previously stated 5.3 km to just under 4 km.
- 5.5.3 The Waveney Valley Alternative, if taken forward, would change around 2 km of overhead line to underground cable (as currently identified) and result in the following total distances for the elements of the Project listed above:
- Total route length approximately 184 km;
 - Total overhead line length approximately 157 km;
 - Total underground cable length approximately 27 km; and
 - Eight CSE compounds.

6. Temporary Works

6 Temporary Works

6.1 Overall Transport Strategy

- 6.1.1 The Transport Strategy for the Project will be informed by the requirement for the movement of materials (stone, concrete, steelwork, conductors, and cables etc), equipment and construction personnel. It will also be influenced by the nature and location of existing transport infrastructure (roads suitable for two-way HGV movements and/or Abnormal Indivisible Loads (AIL), ports with appropriate water depth and offloading facilities, available rail paths and offloading facilities etc). Construction programmes may also modify requirements if material can be re-used between sections.
- 6.1.2 Locally the deliveries and movement to site are expected to be by HGV, LGV and private vehicles. These local deliveries and movements, between the Strategic Road Network and site access points, are the focus of the Project design and assessment with the movement requirements and nature of the road network informing the strategy set out in Section 6.2. The specific siting of different elements facilitating local access has been informed by highway safety, environmental and socio-economic considerations. Avoidance of effects therefore forms an inherent part of the design development approach.
- 6.1.3 Multi-modal considerations are relevant to the long-distance movement of material from source to the Strategic Road Network and are also influenced by commercial considerations in the context of a potentially global supply chain and to some extent by contractor preference. National Grid are investigating the potential use of existing aggregate handling facilities, including those on the rail network, along with the potential use of aggregate import facilities at ports within the region. These have the potential to provide import locations to meet the needs of the Project. Details will be presented within the Development Consent Order application.

6.2 Construction Haul Road and CSE compound access

- 6.2.1 The linear nature of the Project and characteristics of the road network within which it is routed present constraints to materials and equipment movement. The Project is crossed by a number of roads suitable for HGV traffic but also by many that are not appropriate for potentially two-way HGV movement. This has led to the conclusion that the most appropriate transport solution is to identify a series of Primary Access Routes (PAR) connecting to the trunk road network connected along the Project corridor by new site access points (bellmouths) leading to off highway haul roads. HGVs would cross unsuitable parts of the highway network at crossover points (with suitable bellmouths) to and from the haul road. LGV and private vehicles would also use these haul road routes but would also be expected to use the wider road network to minimise journey times and distances.
- 6.2.2 The siting of proposed bellmouths has sought to locate them as close to the proposed works as possible to reduce overall requirements. Siting has also been informed by highway safety considerations (distance from bends, junctions, and visibility splay requirements etc) along with environmental considerations (where possible using or widening existing gates or targeting gaps in boundary vegetation) and socio-economic effects seeking to reduce effects on other existing (or proposed in planning) land use activities.

- 6.2.3 Similar environmental and socio-economic considerations have also influenced the proposed alignment of the haul road connecting between the bellmouths and work locations. Inherently the haul roads will predominantly follow alongside the proposed alignment, which has sought to avoid areas of woodland, but attention has been paid to minimise effects. In some instances of very high value crops (e.g fruit trees, grape vines) we have sought to follow existing tracks and field boundaries. Some environmentally sensitive locations have been avoided by longer diversions (e.g avoiding bridging the River Waveney and River Stour) and effects on commercial businesses reduced by longer diversions (such as routeing the haul road to the south-east of rather than through Ruffian's Wood) to reduce effects on the business¹³ based there.
- 6.2.4 At CSE compounds it is proposed that part of the temporary access road will be retained and provide the permanent access that is required to these sites.

6.3 EACN substation access

- 6.3.1 The proposed access arrangements to the EACN substation (which will also be used for overhead line and underground cable construction activities to the east of the railway) have been developed to respond to circumstances where the EACN substation may be built in isolation or in parallel (at least in part) with construction by North Falls and / or Five Estuaries of their substations and underground cable connections. All parties have and continue to engage constructively to develop an appropriate integrated solution. A third customer, Tarchon, has not yet developed its plans sufficiently to understand how it may integrate with these arrangements.
- 6.3.2 In the case that National Grid constructs first, the proposed access arrangement envisages widening of Bentley Road to be suitable for two-way HGV movement from the junction with the A120 towards Little Bromley (beyond the North Falls and Five Estuaries underground cable corridor) to a new permanent private access road. The new permanent private access road will pass to the southwest of Little Bromley connecting across to Ardleigh Road which would also be widened, and its alignment straightened for two-way HGV flows. This access route would be used for HGV construction traffic (and the much reduced HGV requirement during operational period) and provide the AIL access route through the construction and operational period. Modifications at the Bentley Road / A120 junction would be required to allow AIL vehicle tracking. We are investigating the extent to which additional mitigation may be required for non-motorised users of Bentley Road.
- 6.3.3 In the event that North Falls and/or Five Estuaries have constructed a haul road between Bentley Road and the EACN substation location alongside their underground cable corridor, either before or during National Grid's construction activities at the EACN substation and east of the railway, then the use of this underground cable corridor haul road route would also be shared by National Grid as the primary HGV construction traffic route. The aforementioned new permanent private access road would still be constructed and used primarily for AIL deliveries and lighter construction traffic vehicles and be utilised for future operations and maintenance HGVs. Use by construction HGVs would more limited and occurring in the event of constraint to use of the underground cable corridor haul road or following its removal and land restoration.

¹³ The site offers a variety of uses including secure exercise area, overnight on-site accommodation, swimming ponds etc.

6.4 Temporary Compounds

- 6.4.1 Temporary construction compounds are required to support the construction of the Project. They will have a variety of uses which may include material loading / unloading; material storage; vehicle parking; siting of welfare facilities; siting of construction cabins / modular offices and to complete construction activity.
- 6.4.2 A main compound and two satellite compounds are proposed to support the overhead line works between Norwich Main and the EACN substation and another main compound and two satellite compounds for the overhead line works between the EACN substation and Tilbury Substation. A further 24 compounds are proposed to support substation and underground cable installation comprising: at each of the substation sites (Norwich Main, Bramford, EACN, and Tilbury); at each CSE compound location; spaced along the cable to support cable construction works and for activities such as trenchless crossing locations. The scale of construction compound varies with larger sites required where the potential requirement for, for example cable drum storage' is greatest.
- 6.4.3 Siting of compounds has been informed by the location of particular project elements and the specific need for the compound. For example, a decision to adopt a trenchless crossing technique leads to a need for a construction compound close by. The specific locations proposed for such compounds then seek to avoid / reduce the potential for environmental and socio-economic effects but with a preference to be close to where a bellmouth access to a primary access route is available and preferably close to the primary access route. The latter reduces travel distances for greater efficiency and reduced effects.

6.5 Mitigation

- 6.5.1 The requirement for some mitigation measures to be incorporated to reduce potential effects of the Project is acknowledged. In addition to necessary works to underground existing lower voltage lines to enable the Project, the preceding Section 5 has identified locations where we are proposing to increase the extent of removal (being replaced by underground cable) of existing 132 kV overhead lattice pylon lines as mitigation to reduce effects. In particular as follows:
- Adopting the existing overhead line alignment near Mellis;
 - Extending removal of overhead line between three crossings of an existing line from Offton to Bramford Substation;
 - Extending removal of two overhead lines to the south-east of Bramford Substation; and
 - Extending removal at a crossing of an existing overhead line near Fuller Street.
- 6.5.2 Ongoing assessment informed by field surveys and further feedback will inform other measures which will be incorporated into the final project design taken forward to Development Consent Order submission including:
- Further measures in respect of existing or proposed overhead lattice pylon lines (installation as or replacement by underground cable, alternative pylon type etc);
 - Planting for ecological and landscape screening / filtering of views for example around the EACN substation and CSE compound sites; and
 - Other measures identified through the assessment process.

7. Next Steps

7 Next Steps

7.1 Introduction

- 7.1.1 The feedback from the 2023 non-statutory consultation together with further technical and environmental work has led to the development of the 2024 preferred draft alignment which is the subject of the 2024 statutory consultation.

7.2 Next Steps

- 7.2.1 National Grid is undertaking a statutory consultation on its current proposals between 10 April 2024 and 18 June 2024.
- 7.2.2 During the coming months further detailed assessments and studies will continue along the 2024 preferred draft alignment including environmental and other site-based surveys. These will further inform and refine the location and design of the EACN substation and CSE compounds, pylon positions and adoption of and route of underground cable (particularly at difficult crossings) and the location of areas required temporarily for the construction of the Project.
- 7.2.3 Feedback from the 2024 statutory consultation will also inform this more detailed work.
- 7.2.4 The Project continues to be the subject of environmental impact assessments and there will be on-going consultation with stakeholders, interested parties and members of the public.
- 7.2.5 As with previous stages our decisions will be back checked in the light of feedback to the statutory consultation, the findings of these further studies and assessments and new material information. The outcome will be the design that is submitted to the Planning Inspectorate with the application for a Development Consent Order.
- 7.2.6 National Grid expects to apply to the Planning Inspectorate for a Development Consent Order in Spring / Summer 2025.

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