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Yorkshire GREEN Project

**Corridor and Preliminary Routeing and Siting
Study**

Non-Technical Summary

(YG-NSC-00003)

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ABBREVIATIONS

CSEC	Cable sealing end compound
ECML	East Coast Main Line
EPS	European Protected Species
GCN	Great Crested Newt
GIS	Geographical Information Systems
GREEN	Green Energy Enablement
NCN	National Cycle Network
RAF	Royal Air Force
SINC	Site of Importance for Nature Conservation
SSSI	Site of Special Scientific Interest

GLOSSARY OF KEY TERMS

Term	Definition
Cable Sealing End Compound (CSEC)	Electrical infrastructure used as the transition point between overhead lines and underground cables. A compound on the ground acts as the principal transition point.
Corridor	A broad area, within which a new overhead line could be routed.
Double tee	A connection from both circuits on either side of the same structure, creating a third and fourth circuit on another structure.
East Coast Main Line (ECML)	Electrified railway between London and Edinburgh.
Electricity transmission system	A system that transmits high-voltage electricity from where it is produced to where it is needed throughout the country. The system is made up of high voltage electricity wires.
Graduated swathe	A broad route within a defined corridor, which is shaded to indicate the preferred location of the alignment.
Interconnectors	Physical links which allow the transfer of electricity across borders.
National Grid	National Grid operate the national electricity transmission network across Great Britain and own and maintain the network in England and Wales, providing electricity supplies from generating stations to local distribution companies. National Grid does not distribute electricity to individual premises, but its role in the wholesale market is vital to ensuring a reliable, secure and quality supply to all.
Options appraisal	A robust and transparent process used to compare options and to assess the positive and negative effects they may have across a wide range of criteria including environmental, socio-economic, technical and cost factors. The outcome is to identify a Strategic Proposal for the Project.
Options Identification & Selection	Work undertaken to determine the preferred corridor and preliminary routeing and siting options for the Yorkshire Green Energy Enablement (GREEN) Project. It is intended to demonstrate how National Grid's statutory duties, licence obligations, policy considerations, environmental, socio-economic, technical, cost, and programme issues have been considered and provide information on the approach to the identification and appraisal of route corridors and siting locations.
Overhead line	Conductor (wire) carrying electric current, strung from pylon to pylon.
Project Need Case	Sets out the reasons why the Project is required.
Pylon	Overhead line structure used to carry overhead electrical conductors, insulators and fittings.
Siting Area	An area of land within which a new CSEC or substation could be sited.
Strategic Proposal	The outcome of the strategic options appraisal; the Strategic Proposal is then taken forward to the Options Identification & Selection stage.
Substation	Electrical equipment in an electric power system through which electrical energy is passed for transmission, transformation, distribution or switching.
Underground Cable	An insulated conductor carrying electric current designed for underground installation.
Yorkshire Green Energy Enablement (GREEN) Project (the Project)	The Project is required to reinforce the north to south boundary flow by 2027 enabling National Grid to meet future system demands which include several Green Energy customer connections such as Eastern Link (wind/hydro), Continental Interconnector (Wind) and Hornsea P4 Windfarm (Wind) and the Atlantic Super Connection (Interconnector)

1. INTRODUCTION

1.1 Background

1.1.1 The Yorkshire Green Energy Enablement (GREEN) Project (hereinafter referred to as the ‘Project’) is being developed by National Grid and comprises a major reinforcement of the electricity transmission system to provide additional north-south power flows, helping increase power generated from renewables (especially from offshore wind), in addition to new interconnectors in Scotland and the North of England, to reach consumers.

1.1.2 In 2019, several strategic options were identified which were deemed to meet the Project Need Case; these options were subject to a strategic options appraisal and a Strategic Proposal was identified for the Project. The Project has subsequently been subject to a review process once further details were identified during the Options Identification & Selection stage.

1.1.3 As part of the Options Identification & Selection stage, a routeing and siting study has been completed to identify the preferred routes and locations for new infrastructure associated with the Project.

1.2 Overview of the Project

1.2.1 The Project will include the construction of new infrastructure consisting of substations, cable sealing end compounds (CSEC), underground cables and overhead lines. In addition, the Project will also include upgrade works to existing infrastructure, which will include the Installation of additional equipment at existing sites (Osbalwick substation and remote end substations) and reconductoring, strengthen and potential pylon replacement of the XCP 275kV overhead line of existing overhead lines.

Cable Sealing End Compound

Electrical infrastructure used as the transition point between overhead lines and underground cables. A compound on the ground acts as the principal transition point.

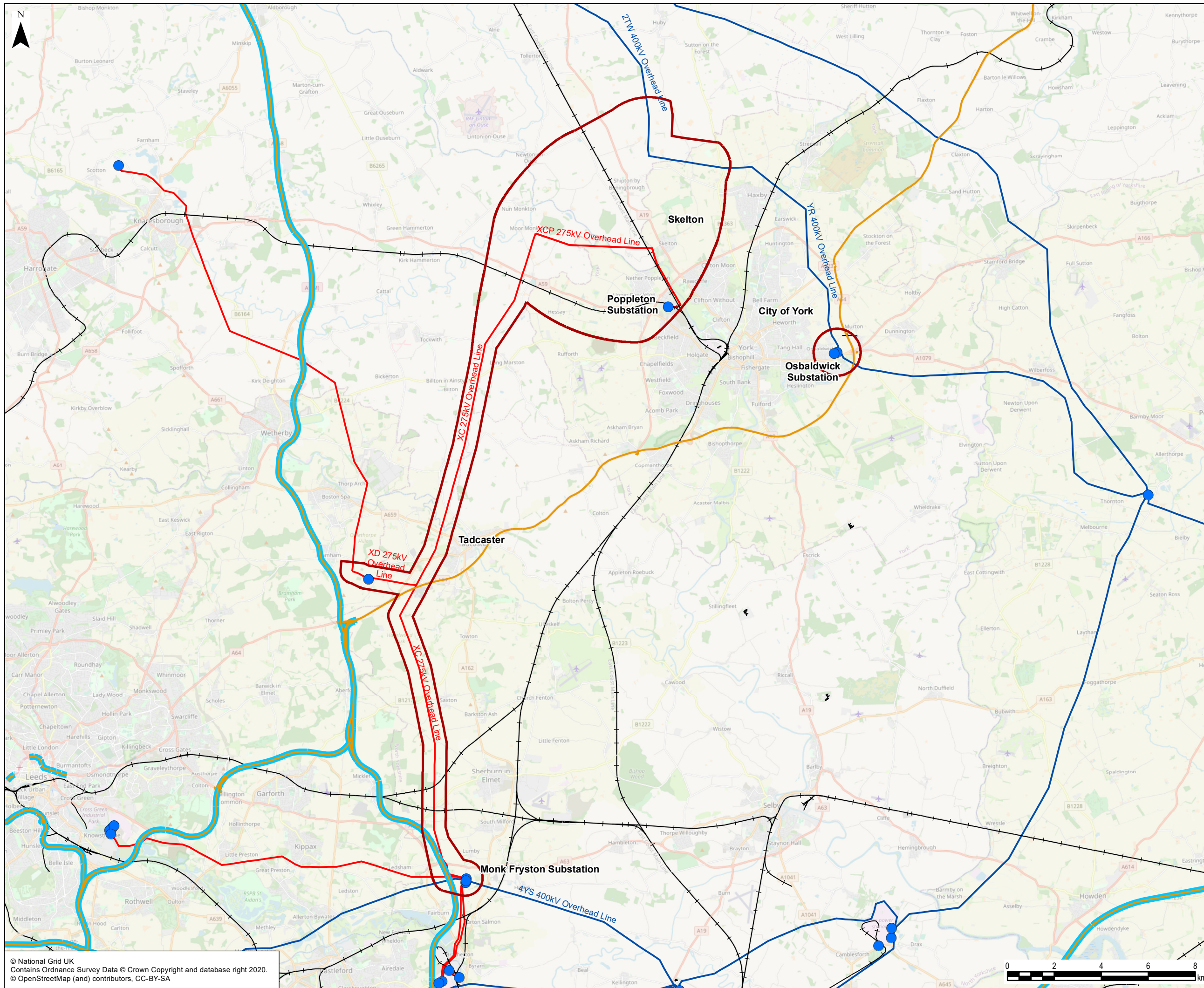
1.2.2 The focus of the routeing and siting study summarised in this Non-Technical Summary (NTS) is related to new infrastructure only which is proposed at three locations:

Substation

Electrical equipment in an electric power system through which electrical energy is passed for transmission, transformation, distribution or switching.

- North of York (hereinafter referred to as ‘York North’);
- Tadcaster; and
- Monk Fryston.

1.2.3 The locations of the new infrastructure are shown in **Figure 1.1**. **Figure 1.2** shows how the proposed components would connect with the existing infrastructure.



LEGEND

- Study Area
- Substation
- 400 kV Overhead Line
- 275 kV Overhead Line
- Trunk Road
- Motorway
- Railway Track

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Scheme: YORKSHIRE GREEN PROJECT

Document Title: **FIGURE 1.1
EXTENT OF THE YORKSHIRE
GREEN PROJECT**

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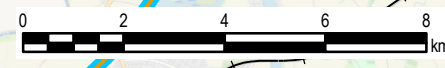
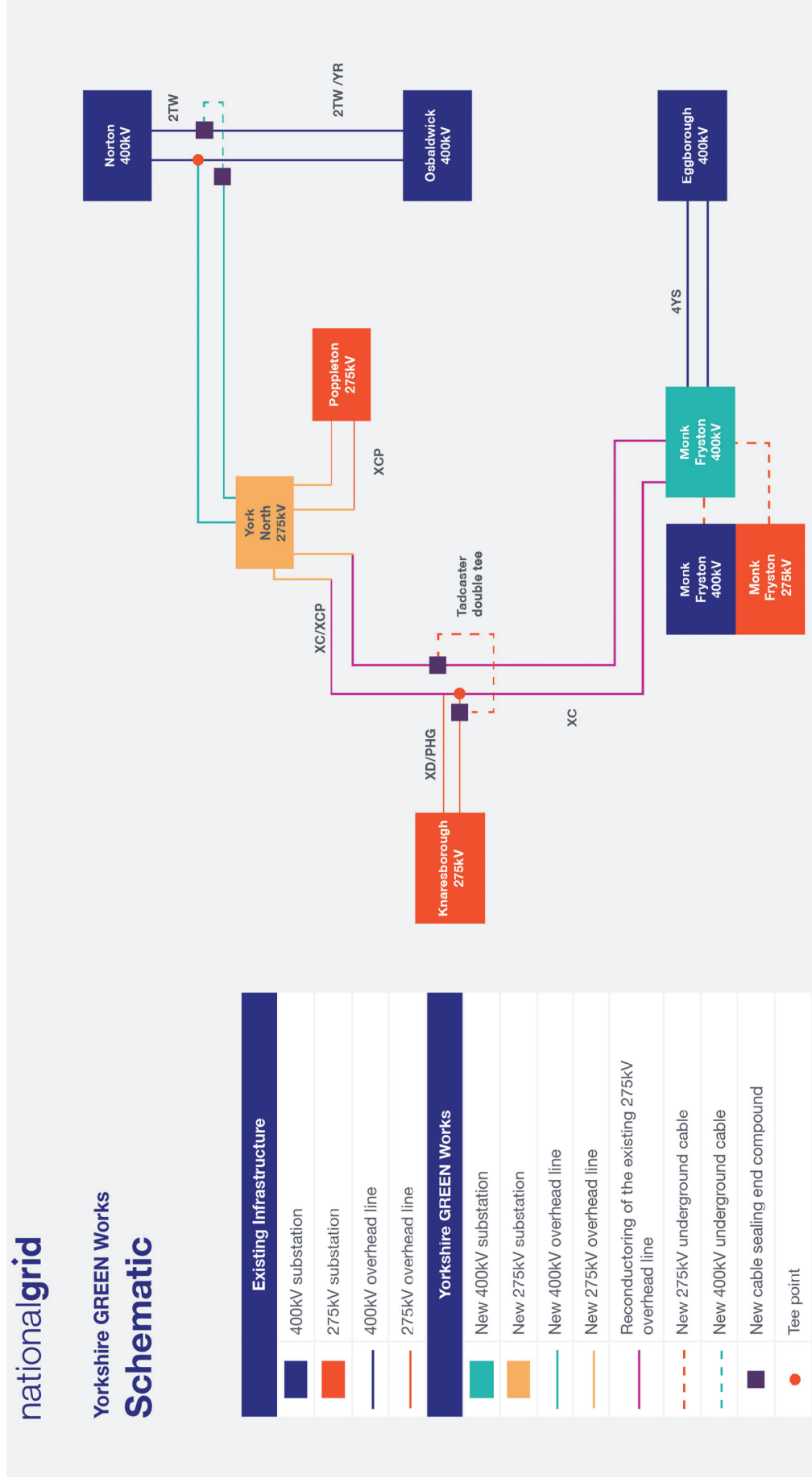


Figure 1.2: Schematic Diagram of the Proposed Works



1.3 About the Project Components Consider as Part of the Routeing and Siting Study

1.3.1 There are three locations where new infrastructure would be constructed:

York North

- Two proposed CSECs, each approximately 50m x 40m, to support a double tee off arrangement from the existing 2TW/YR 400kV overhead line north east of Shipton by Beningbrough.
- Proposed underground cables connecting the two CSECs.
- Proposed 400kV overhead line between the tee off point from the existing 2TW/YR 400kV overhead line (see above) and the proposed York North 275kV substation.
- A proposed York North 275kV substation (including Super Grid Transformers (SGT)), covering an area of approximately 310m x 230m, north of the existing XCP 275kV overhead line to enable connection into the electricity transmission system.
- Two proposed 275kV overhead lines between the proposed York North 275kV substation and the existing XCP 275kV overhead line.
- A proposed 275kV CSEC, approximately 50m x 40m potentially within the footprint of the proposed York North 275kV substation to connect a circuit of the proposed 275kV overhead line into the proposed York North 275kV substation.
- Proposed underground cables connecting the CSEC and the proposed York North 275kV substation.

Tadcaster

- Two proposed 275kV CSECs, each approximately 50m x 40m, to support a double tee off arrangement close to the existing XD/XC 275kV overhead line junction.
- Proposed underground cables connecting the two CSECs.

Monk Fryston

- A proposed Monk Fryston 400kV substation, covering an area of approximately 350m x 210m, in close proximity to the existing Monk Fryston 275kV/400kV substation to enable connection into the electricity transmission system. It is expected that the proposed substation would be similar in height to the existing buildings and infrastructure.
- Associated infrastructure comprising:
 - A proposed 275kV CSEC, approximately 50m x 40m in close proximity to, or potentially inside the substation compound the proposed Monk Fryston 400kV substation.

- Proposed overhead lines to connect existing overhead line with the proposed Monk Fryston 400kV substation¹.
- Proposed underground cables connecting the CSEC and the proposed Monk Fryston Substation.

1.4 Purpose of this Report

- 1.4.1 This document provides a non-technical summary of the *Yorkshire GREEN Project: Corridor and Preliminary Routeing and Siting Study Report*² which outlines in detail the steps taken to identify and assess potential corridor and siting options.

¹ Depending on the location and layout of the proposed substation this may include a new 275kV overhead line to connect the existing 275kV overhead line to the west into the proposed substation or a new 400kV overhead line to connect to substation with the existing 400kV overhead line to the east.

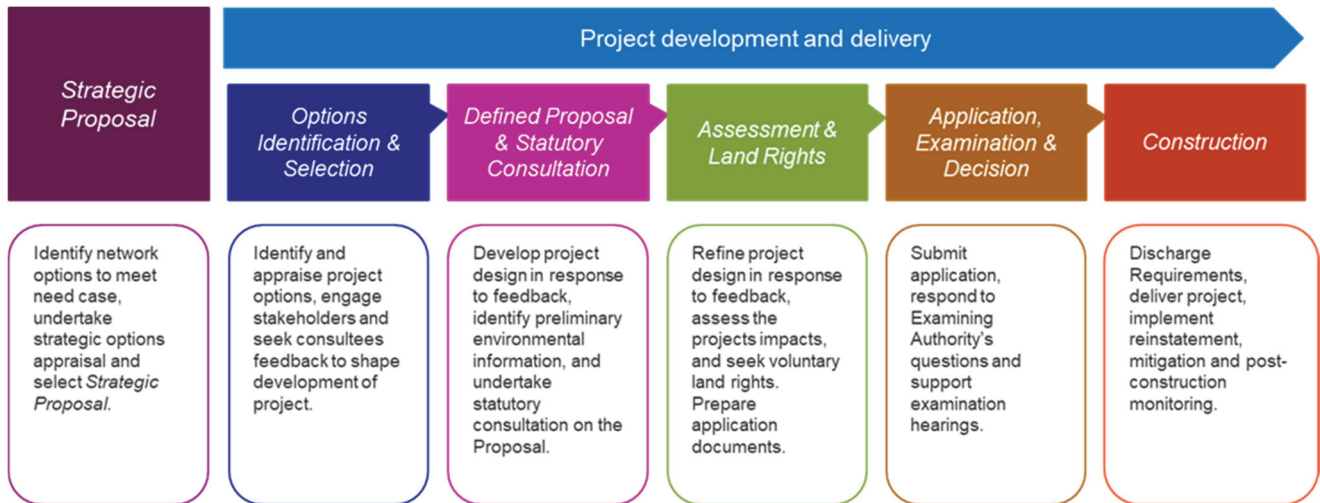
² AECOM, January 2021. Yorkshire GREEN Project: Corridor and Preliminary Routeing and Siting Study Report

2. APPROACH TO ROUTEING AND SITING

2.1 Overview of National Grid’s Approach

2.1.1 **Figure 2.1** below presents an overview of National Grid’s approach to consenting. The Project is at the Options Identification & Selection stage; a summary of the main objectives of this stage of the consenting process can be seen below.

Figure 2.1: National Grid’s Approach to Project Development and Delivery



2.1.2 Each of the options identified for the proposed Project components have been appraised using a series of topics and sub-topics in accordance with National Grid’s Option Appraisal Guidance. **Table 2.1** presents the topics and sub-topics considered.

Table 2.1: Options Appraisal Topics

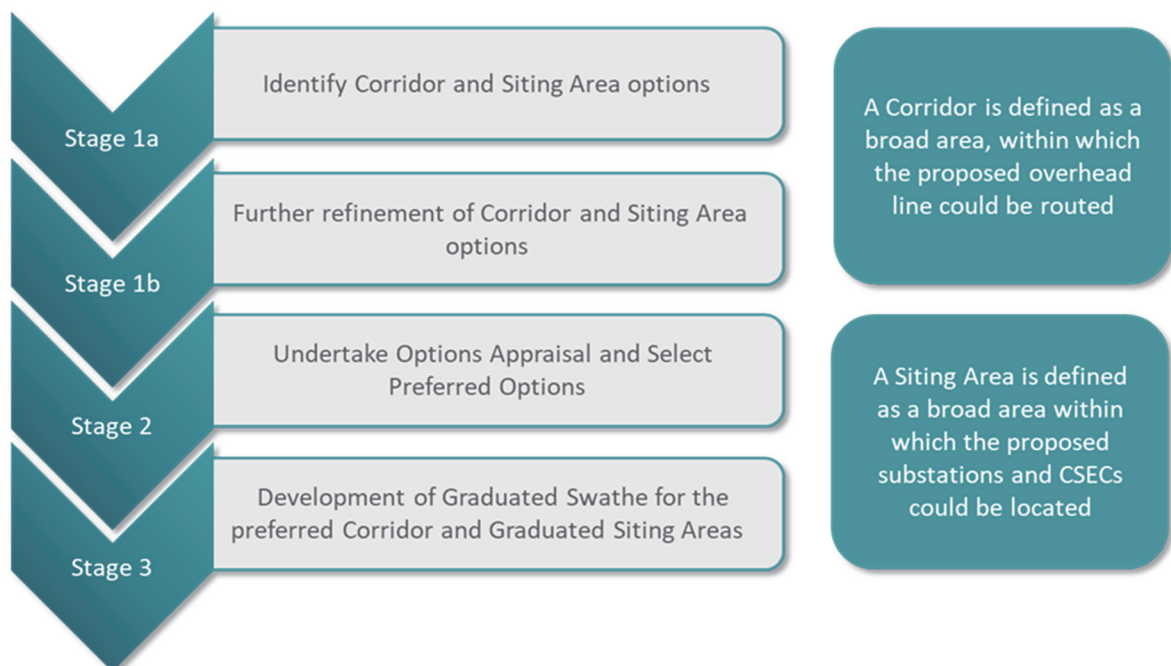
Environment	Socio-economics	Technical	Cost
Biodiversity	Local community and recreational receptors	System operation	Capital cost
Physical environment including soils, geology and water (including flood risk)	Local economic receptors	Construction and delivery issues	Lifetime cost
Landscape and visual amenity	Infrastructure	Technology issues	
Historic environment	Land ownership/type	Operational and maintenance issues	
	Future development and receptors (including planning applications and allocations and planning policy designations)	Commercial, regulatory and third-party issues	

- 2.1.3 The following guiding principles informed the identification of the preferred options:
- Using or adapting existing infrastructure will generally be of benefit/advantage.
 - Shorter routes will generally be of benefit/advantage.
 - Cheaper options (both capital and lifetime cost) will generally be of benefit/advantage.
 - Options which avoid or minimise and mitigate impacts on environmental or socio-economic constraints will generally be of benefit/advantage.
- 2.1.4 Following completion of the options appraisal, collective discussions were held to review the appraisal work, challenge judgements made, check understanding and assumptions, and compile an overall view of the relative performance of each option. A broad overview of the stages undertaken to identify the preferred options of the Project is outlined below.

2.2 Route and Site Selection Process

- 2.2.1 **Figure 2.2** presents the approach taken for the Options Identification & Selection stage; this was based on the initial identification of Corridors and Siting Areas, which were subject to further refinement through the review and analysis of available data and a site visit attended by specialists for landscape and visual amenity, biodiversity and historic environment.
- 2.2.2 To support the optioneering process, geographical information system (GIS) web mapping was developed, comprising available environmental, socio-economic and technical data from a range of data sources within the Study Area.

Figure 2.2: Options Identification and Selection Process



2.3 Overview of Stages of Development

2.3.1 This section provides further detail of the process outlined in **Figure 2.2**.

Stage 1a&b – Identify and Define Corridors and Siting Area Options

York North

- The proposed York North substation should be within proximity of the ‘East to West’ (Skelton to Moor Monkton) section of the existing 275kV XCP overhead line to minimise the length of double circuit 275kV overhead line connections required between the proposed York North substation and the existing XCP overhead line.
- Two proposed CSECs on the 2TW/YR overhead line should be in close proximity to the existing 2TW/YR overhead line to minimise the amount of underground cabling required to connect the proposed CSECs.

Tadcaster

- Two proposed CSECs should be in close proximity to the existing junction and close to existing pylons to limit the extent of underground cabling to connect the two proposed CSECs and to minimise the length of the downloads connecting each proposed CSEC to the pylon.

Monk Fryston

- Proposed Monk Fryston substation and associated infrastructure should be in close proximity to the existing Monk Fryston substation to enable connections to be made efficiently between the two substations to minimise environmental impact and cost.

2.3.2 The development of the Corridors and Siting Areas took account of the high-level mitigation measures³ set out below at **Table 2.2**. These measures are aligned with the mitigation listed in Section 5 of Overarching National Policy Statement for Energy (EN-1)⁵ and Section 2 of the National Policy Statement for Electricity Network Infrastructure (EN-5)⁶, including Section 5.3 of EN-1 and Section 2.7 of EN-5 (Biodiversity and Geological Conservation), Section 5.7 of EN-1 (Flood Risk) and Section 5.8 of EN-1 (Historic Environment).

³ A mitigation measure is defined as process to avoid, reduce or compensate for potential impacts as a result of Project activities.

⁵ Department of Energy and Climate Change, July 2011. Overarching National Policy Statement for Energy (EN-1).

⁶ Department of Energy and Climate Change, July 2011. National Policy Statement for Electricity Network Infrastructure (EN-5)

Table 2.2: Mitigation for the Development of Corridors and Siting Areas

Stage	Corridors	Siting Areas
1 a	<ul style="list-style-type: none"> Avoid routeing close to residential areas as far as possible (in alignment with supplementary note of the Holford Rules). Avoid Grade I and Grade II* listed built heritage. Avoid designated ancient woodland. Avoid areas of woodland greater than 350m wide (i.e. where it would not be possible to span across the areas). 	<ul style="list-style-type: none"> Avoid siting close to residential areas as far as possible. Avoid Flood Risk Zone 2 and Zone 3. Avoid clusters of more than five of residential properties. Avoid Grade I and Grade II* listed built heritage. Avoid designated ancient woodland. Avoid areas of significant woodland. Avoid Site of Importance for Nature Conservations (SINC)
1 b	<ul style="list-style-type: none"> Setback 50m from ponds known to support great crested newt (GCN)^{^^}. Setback 15m from designated ancient woodland[^]. Setback from Grade II* and Grade I listed built heritage as per advice of the heritage technical specialist (the setting of assets was evaluated and bespoke buffers were determined) (in alignment with notes on Rule 2 of the Holford Rules). 	<ul style="list-style-type: none"> Setback 15m from areas of mature woodland (including ancient woodland)[^]. Setback 250m from ponds known to support GCN^{^^}. Setback from Grade II* and Grade I listed built heritage as per advice of the heritage technical specialist (the setting of assets was evaluated and bespoke buffers were determined).
<p>Notes:</p> <p>[^] In accordance with Natural England guidance⁷</p> <p>^{^^} Based on professional judgment</p> <p>There are two SINC's within the York North Study Area: Overton Wood (an ancient woodland) and Overton Borrowpit. The existing XCP 275kV overhead line is routed over Overton Borrowpit SINC, which also includes a pylon.</p>		

2.3.3 Corridors and Siting Areas were identified as summarised in **Table 2.3**.

Table 2.3: Identification of Corridors and Siting Areas

Location	Corridors	Siting Areas
York North	Four (A, B, C, and D) plus an additional Corridor section (A1) which provided options to connect with the far western extent of the existing 275kV XCP overhead line.	12 taking into account the preference for the proposed substation to be within proximity of the 'East to West' section of the existing 275kV XCP overhead line.
Tadcaster	N/A	Ten (three on the existing 275kV XC overhead line and seven on the existing 275kV XD overhead line).

⁷ Natural England, 2014. Ancient woodland, ancient trees and veteran trees: protecting them from development. <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences>. Accessed on 15th Dec 2020.

Location	Corridors	Siting Areas
Monk Fryston	N/A	Three taking into account the preference for the proposed substation to be in close proximity (i.e. adjacent) to the existing substation. An additional Associated Infrastructure Siting Area was also defined within which necessary infrastructure would be sited.

Stage 2 – Undertake options Appraisal and Selection of Preferred Options

2.3.4 Following agreement of the Corridors and Siting Areas, they were subject to options appraisal followed by a workshop to reach agreement on the Preferred Corridor for the new overhead lines and Preferred Siting Areas for the proposed substations, underground cable and CSECs.

Stage 3 – Development of Graduated Swathe for the Preferred Corridor and Graduated Siting Areas

2.3.5 Following agreement of the Preferred Siting Areas and the Preferred Corridor, the Project Team developed a preliminary route alignment for the proposed overhead lines and locations within Preferred Siting Areas for the proposed substations and CSECs, which took into consideration the environmental and socio-economic constraints identified, where present. This included the consideration of the Holford Rules for the preliminary route alignments, with particular regard of Rules 1, 2 and 3 to avoid areas of amenity value and while taking this into consideration selecting a direct route. This led to the development of a graduated preliminary route swathe within the Preferred Corridor and graduated preliminary locations with the Siting Areas.

3. THE STUDY AREA

3.1 Introduction

3.1.1 **Figure 1.1** shows the location of the Study Area, which is wholly located within Yorkshire and includes the three key areas of focus for the options appraisal: North York, Tadcaster and Monk Fryston.

3.2 York North Study Area

- 3.2.1 The York North Study Area largely comprises agricultural land, with the City of York approximately 2km to the south east where the Study Area boundary passes close to the settlements of Poppleton and Rawcliffe. Larger settlements are in the eastern extent and include Skelton, Nether Poppleton and Upper Poppleton with populations of 1,549, 2077 and 1997, respectively, based on the 2011 census data⁸. The settlements of Moor Monkton and Nun Monkton are in the western extent and the settlement of Shipton-by-Beningbrough is in the northern extent; the populations of these settlements are 348, 173 and 872, respectively. There are also several hamlets including Overton to the east and Beningbrough to the west, both with a population of less than 100.
- 3.2.2 The East Coast Main Line (ECML) (traveling from York to Edinburgh) runs through the York North Study Area in a south east to north west direction. There are no trunk roads in the York North Study Area, but there are two A roads connecting with the City of York (A19 and A59). The Way of the Roses National Cycle Network (NCN) crosses the Study Area linking the City of York with Beningbrough Hall (a Grade I listed building owned by the National Trust).
- 3.2.3 The River Ouse crosses the York North Study Area in a south east to north west direction, with Flood Zone 2 and Flood Zone 3 land either side. The River Ouse is a City of York Site of Importance for Nature Conservation (SINC) candidate⁹, although at the time this report was prepared this designation had not been ratified. Other notable watercourses include Moor Gutter, Hurns Gutter and Hurns Drain. There are two areas of ancient woodland, Overton Wood (also designated as a SINC) and Redhouse Wood, located north of the existing XCP overhead line. Clifton Ings and Rawcliffe Meadows Site of Special Scientific Interest (SSSI) is at the south eastern extent of the Study Area immediately east of the existing National Grid Poppleton 275kV substation. Overton Borowpits is a SINC located to the west of Skelton and the east of the ECML railway supporting scrub and species rich fen meadow.
- 3.2.4 There are several buildings of heritage significance within the Study Area including the Grade I listed Beningbrough Hall, Church of St Giles in Skelton and Church of St Mary's in Nun Monkton. Grade II* properties include the Church of St Everilda in Nether Poppleton, Skelton Manor, Red House School Chapel and the Church of All Saints in Moor Monkton. In addition to the Grade I and Grade II* listed buildings, there are many Grade II buildings located throughout the Study Area.

⁸ <https://www.ons.gov.uk/census/2011census/2011censusdata>. Accessed 25th February 2021.

⁹ City of York Council, 2017, Sites of Importance Nature Conservation Review 2017

3.3 Tadcaster Study Area

- 3.3.1 The existing XD/XC 275kV junction is approximately 1.3km south west of Tadcaster; it is in a rural setting with the A64 approximately 50m south. The existing Bramham 132kV substation is within the boundary of the Tadcaster Study Area to the west of the existing XD/XC 275kV overhead line junction. A residential property is approximately 100m east of the XD/XC 275kV junction and a further residential property is approximately 500m to the north.
- 3.3.2 The Tadcaster Study area includes a number of listed buildings, however the only one within 500m of the Siting Areas is a Grade II milestone post (reference: 1132446) located on the A659. All other listed buildings are located more than 1km from the location of the Siting Areas.

3.4 Monk Fryston Study Area

- 3.4.1 The existing Monk Fryston substation is situated in a rural setting surrounded by fields. Rawfield Lane forms its western boundary. There are two residential properties within close proximity; a farmhouse (and associated farm buildings) located approximately 500m west and the Grade II listed Monk Fryston Lodge (and associated buildings) approximately 200m to the east.
- 3.4.2 The A1(M) is both visible and audible from the existing substation boundary. The villages of Monk Fryston and Hillam are approximately 2km to the east of the existing substation and the hamlet of Lumby is approximately 1km to the north. Fairburn is approximately 1km south on the opposite side of the A1(M) and Burton Salmon approximately 1.5km south east.

4. YORK NORTH OPTIONS APPRAISAL

4.1 Routeing and Siting Factors

4.1.1 **Table 4.1** sets out the factors that were considered when identifying potential CSEC Siting Areas, substation Siting Areas and routeing of the proposed 400kV overhead line connecting the 2TW/YR overhead line with the proposed York North substation and the proposed two 275kV overhead lines connecting the proposed York North substation with the existing XCP overhead line.

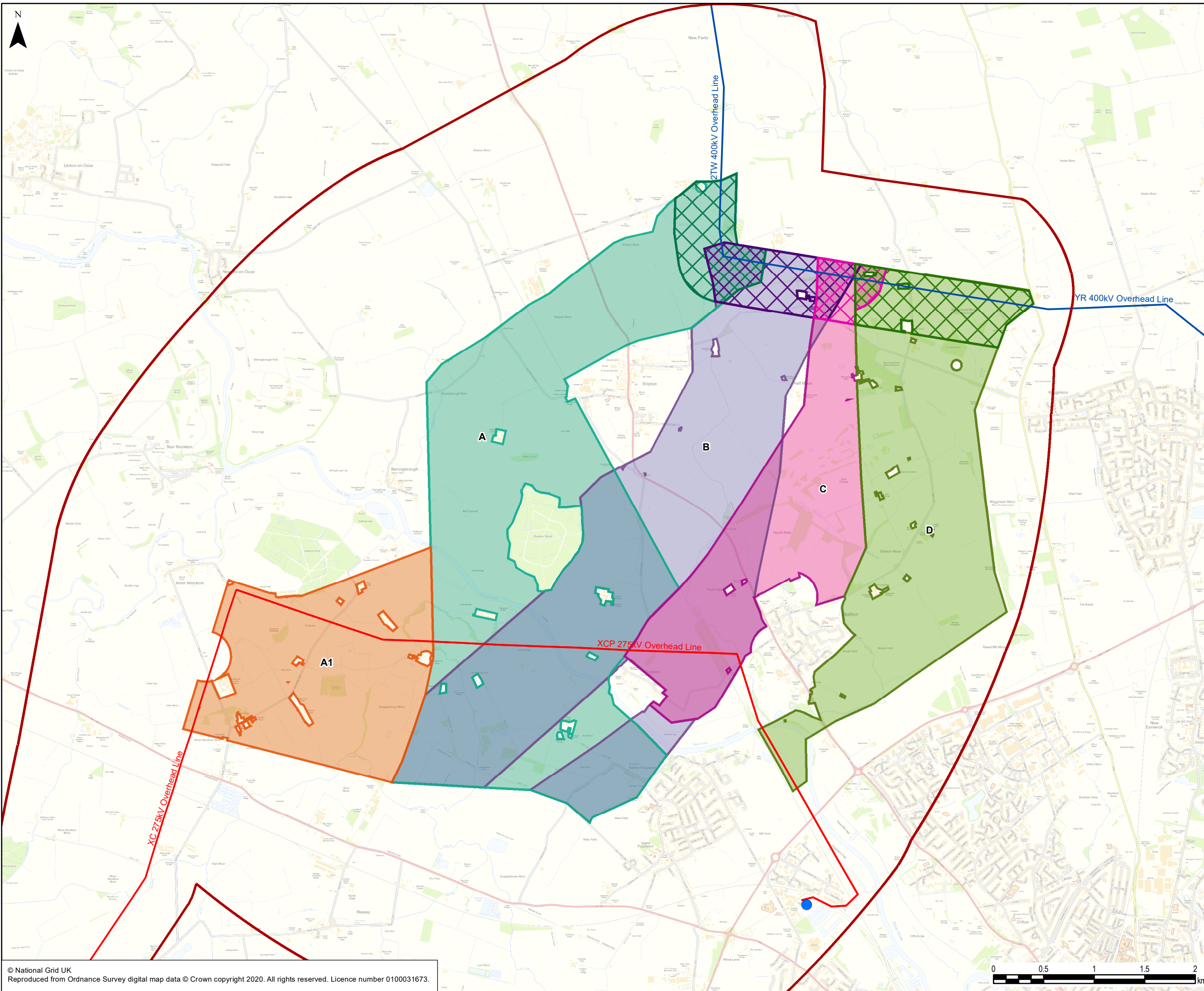
Table 4.1: Routeing and Siting Factors

CSEC Siting Areas	Substation Siting Areas	Overhead Line Routeing
Land take: The Siting Area requires sufficient space to accommodate the proposed CSEC footprint (approximately 50m x 40m).	Land take: The Siting Area requires sufficient space to accommodate the proposed substation footprint (approximately 310m x 230m).	Existing environment: The Siting Area location sought to avoid known environmental and socio-economic constraints, where possible.
Existing environment: The Siting Area locations sought to avoid known environmental and socio-economic constraints, where possible.	Existing environment: The Siting Area locations sought to avoid known environmental and socio-economic constraints, where possible.	Guidelines, as adopted by National Grid, for the Routeing of New High Voltage Overhead Transmission Lines (the Holford Rules).
Guidelines, as adopted by National Grid, on the Siting and Design of Substations (the Horlock Rules).	Guidelines, as adopted by National Grid, on the Siting and Design of Substations (the Horlock Rules).	

4.2 Combination Options and Screening

4.2.1 **Figure 4.1** shows the location of the Corridors and CSECs and **Figure 4.2** shows the location of the 12 Siting Areas identified.

4.2.2 Given that the proposed components of York North are linked together, the options appraisal process has considered 21 different combinations as summarised in **Table 4.2** below.



LEGEND

- Study Area
- Substation
- 400 kV Overhead Line
- 275 kV Overhead Line

Siting Areas for 2TW Cable Sealing End Compound (CSEC)

- 2TW CSEC Siting Area A
- 2TW CSEC Siting Area B
- 2TW CSEC Siting Area C
- 2TW CSEC Siting Area D

Corridor for Overhead Line

- A
- A1
- B
- C
- D

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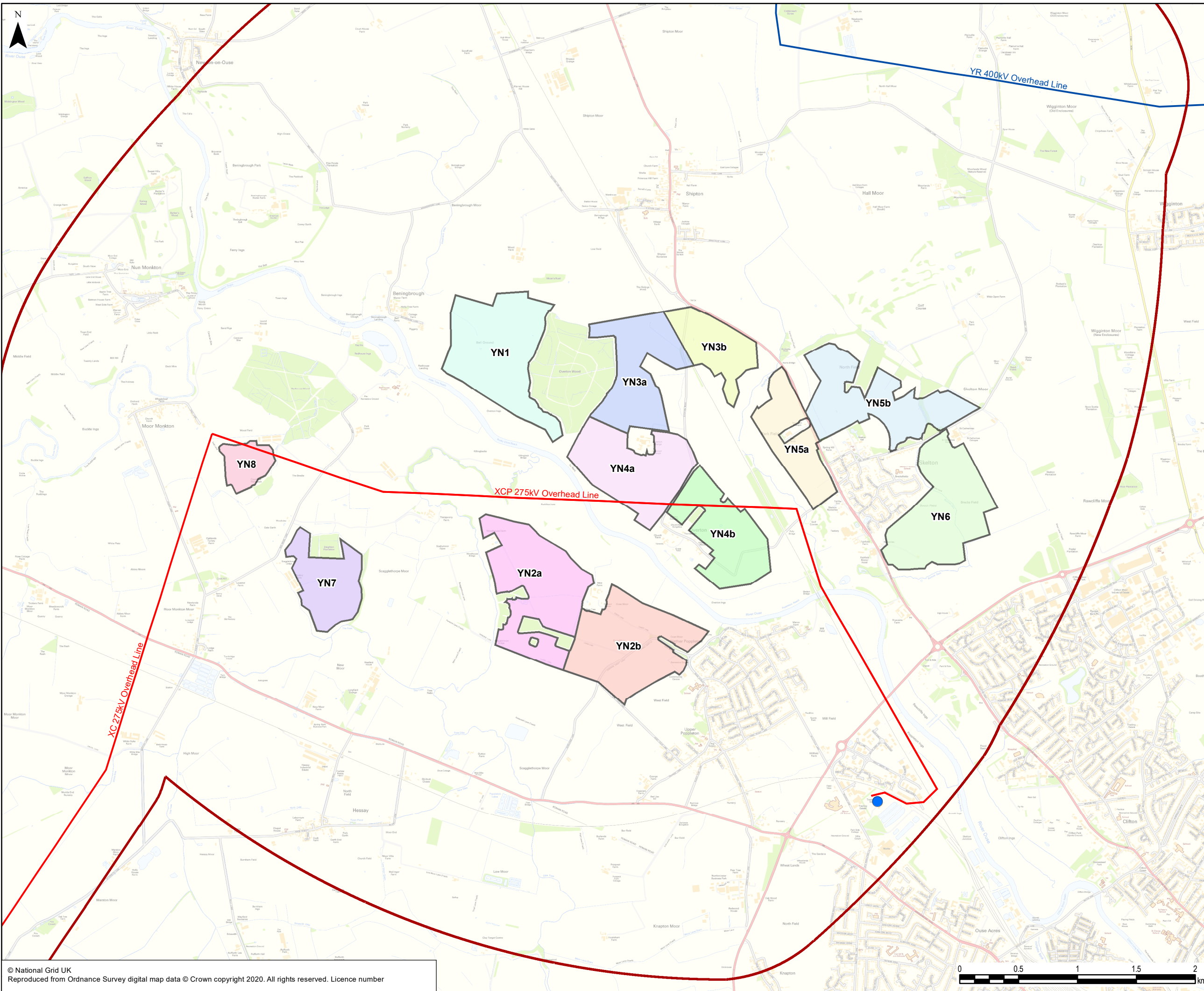
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Scheme: YORKSHIRE GREEN PROJECT

Document Title: **FIGURE 4.1 YORK NORTH CORRIDORS AND CSEC SITING AREAS**

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LEGEND

- Study Area
- Substation
- 400 kV Overhead Line
- 275 kV Overhead Line

Siting Areas for York North Substation

- YN1
- YN2a
- YN2b
- YN3a
- YN3b
- YN4a
- YN4b
- YN5a
- YN5b
- YN6
- YN7
- YN8

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Scheme: YORKSHIRE GREEN PROJECT

Document Title: **FIGURE 4.2 YORK NORTH SUBSTATION SITING AREAS**

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- 4.2.3 Following the options appraisal, a screening exercise was undertaken to identify the least preferred options through consultation with all technical specialists and the Project Team. The least preferred options, in general, corresponded to the most southerly routes where the overarching constraints associated with these locations included limited or restricted access to this area; longer and more complex overhead line routes, which increased the landscape and visual impact; and crossing the River Ouse and the potential impact this may have on birds. The options that were screened out ahead of the Preferred Option Workshop are identified in **Table 4.2** below.
- 4.2.4 It should be noted that while planning was considered as part of the options appraisal; it was not considered to be a driver for screening out any of the options. The key reason being that, with the exception of Siting Area YN8, all Siting Areas are located within the Green Belt and as identified in the draft York Local Plan within an area of search for minerals and minerals safeguarding¹⁰. Again, with the exception of small areas of Corridor A and A1, all Corridors are within the Green Belt and areas identified in the draft York Local Plan as areas of search for minerals and a mineral safeguarding. In addition, Corridor A is located in close proximity Aerodrome Safeguarding Area associated with Royal Air Force (RAF) Linton-on-Ouse in the adopted Hambleton Local Plan¹¹. While the importance of the Green Belt is acknowledged, the need to site the Project with designated Green Belt is considered unavoidable to achieving the objectives of the Project. Furthermore, it is considered that the installation of electricity infrastructure will constitute engineering operations and will not, therefore, be considered to be inappropriate development.

¹⁰ <https://maps.northyorks.gov.uk/connect/analyst/mobile/#/main?mapcfg=mwjp>. Accessed 23rd February 2021.

¹¹ It should be noted that draft Hambleton Local Plan, 2019 proposes an extended Aerodrome Safeguarding Area, which would potentially include cover substation Siting Areas, CSEC Siting Areas and Corridors.

Table 4.2: Combination Options for York North

Option Reference	Combination Option			Screened Out ahead of the Preferred Option Workshop (Least Preferred)	Key Reason for Screening Out
	Corridor	Substation Siting Area	2TW/YR CSEC Siting Area		
A.YN1	A	YN1	2TWA		
A.YN2a	A	YN2a	2TWA	Yes	<ul style="list-style-type: none"> Limited access to Substation Siting Area Long overhead line route
A.YN2b	A	YN2b	2TWA	Yes	<ul style="list-style-type: none"> Limited access to Substation Siting Area Long overhead line route Potential landscape and visual impacts from Nether Poppleton and Upper Poppleton
A.YN3a	A	YN3a	2TWA		
A.YN4a	A	YN4a	2TWA		
A.A1.YN7	A + A1	YN7	2TWA	Yes	<ul style="list-style-type: none"> Limited access to Substation Siting Area Long overhead line route Potential landscape impacts to the River Ouse corridor
A.A1.YN8	A + A1	YN8	2TWA	Yes	<ul style="list-style-type: none"> Limited access to locate the substation within the Substation Siting Area Limited access to Substation Siting Area Long overhead line route
B.YN2a	B	YN2a	2TWB	Yes	<ul style="list-style-type: none"> Limited access to Substation Siting Area Long overhead line route
B.YN.2b	B	YN2b	2TWB	Yes	<ul style="list-style-type: none"> Limited access to Substation Siting Area Long overhead line route Potential landscape and visual impacts from Nether Poppleton and Upper Poppleton
B.YN3a	B	YN3a	2TWB		

Option Reference	Combination Option			Screened Out ahead of the Preferred Option Workshop (Least Preferred)	Key Reason for Screening Out
	Corridor	Substation Siting Area	2TW/YR CSEC Siting Area		
B.YN3b	B	YN3b	2TWB		
B.YN4a	B	YN4a	2TWB		
B.YN4b	B	YN4b	2TWB	Yes	<ul style="list-style-type: none"> Limited access to Substation Siting Area likely to require a new road Proximity to Overton
B.YN5a	B	YN5a	2TWB		
B.YN5b	B	YN5b	2TWB		
B.A1.YN7	B + A1	YN7	2TWB	Yes	<ul style="list-style-type: none"> Limited access to Substation Siting Area Long overhead line route Potential landscape impacts to the River Ouse corridor
B.A1.YN8	B+ A1	YN8	2TWB	Yes	<ul style="list-style-type: none"> Limited access to locate the substation within the Substation Siting Area Limited access to Substation Siting Area Long overhead line route
C.YN4b	C	YN4b	2TWC		
C.YN5a	C	YN5a	2TWC		
C.YN5b	C	YN5b	2TWC		
D.YN6	D	YN6	2TWD		

4.3 Overview of Remaining York North Options

4.3.1 Table 4.3 provides an overview of the 12 remaining York North options.

Table 4.3: Overview of Remaining York North Options

Option	Overview
A.YN1	<p>The CSEC Siting Area (2TWA) is located approximately 1km north of Shipton by Beningbrough and spans across a number of medium-scale, flat arable fields. The fields are bounded by a mix of field drains and managed and overgrown hedgerows with frequent hedgerow trees. A small block of deciduous woodland and woodland belts are within the Siting Area.</p> <p>Corridor A extends west from the 2TW/YR overhead line around Shipton by Beningbrough across arable landscape. The Corridor separates around Overton Wood (designated as an ancient woodland). It crosses several transport routes including the A19 and the East Coast Main Line (ECML) railway.</p> <p>The substation Siting Area (YN1) is located to the north of the River Ouse and spans across a number of medium-scale arable fields gradually sloping up from the banks of the River Ouse. The fields are bounded by hedgerows with frequent hedgerow trees. This pattern of medium-scale arable fields continues to the north. To the west are small scale fields associated with the small hamlet of Beningbrough, to the east is Overton Wood and a large block of Ancient Woodland, to the south are the banks of the River Ouse.</p>
A.YN3a	<p>The description presented above in Option A.YN1 for the CSEC Siting Area and Corridor A are also valid for Option A.YN3a.</p> <p>The substation Siting Area YN3a, located north of the River Ouse and directly west of the ECML, spans across several medium-scale arable fields with relatively flat landform. The fields are bounded by intensively managed hedgerows with Overton Wood demarking the western boundary. The Way of the Roses NCR crosses the south eastern corner of the Siting Area.</p>
A.YN4a	<p>The description presented above in Option A.YN1 for the CSEC Siting Area and Corridor A are also valid for Option A.YN4a.</p> <p>The substation Siting Area YN4a is located north of the River Ouse and cuts around Overton Grange Farm to the north. The area spans across several medium-scale arable fields, which are generally flat with intensively managed hedgerows defining the boundary of the fields. To the north west is Overton Wood and to the south west are smaller scale arable field and pastures associated with the River Ouse corridor. To the south east is the small hamlet of Overton and associated small scale fields.</p>
B.YN3a	<p>The CSEC Siting Area (2TWB) is located approximately 1km north east of Shipton by Beningbrough and spans across a number of medium-scale, flat arable fields. The fields are bounded by a mix of field drains and managed and overgrown hedgerows with frequent hedgerow trees. A number of properties are located within the boundary of the CSEC Siting Area.</p> <p>Corridor B extends west from the 2TW/YR overhead line around Shipton by Beningbrough across arable landscape. The Corridor separates around Overton Wood (designated as an ancient woodland). As with Corridor A it crosses several transport routes including the A19 and the ECML and includes the Hurns Gutter watercourse within its boundary, a tributary to the River Ouse. There are no settlements within Corridor B although it wraps around the small hamlet of Overton in the south. The following settlements lie within approximately 3km to the west: Nun Monkton, Moor Monkton, Beningbrough and Shipton by Beningbrough (which is immediately west). Immediately to the east lie Skelton, Nether Poppleton and Upper Poppleton.</p>

Option	Overview
	<p>Wigginton and residential areas on the outskirts of York (inside the A1237 outer ring road) all lie further away to the east.</p> <p>The description presented above in Option A.YN3a for the substation Siting Area is also valid for Option B.YN3a.</p>
B.YN3b	<p>The descriptions presented above in Option B.YN3a for the CSEC Siting Area and Corridor B are also valid for Option B.YN3b.</p> <p>The substation Siting Area YN3b is located to the east of the ECML and is bound to the west by the A19 road. The Way of the Roses National Cycle Network (NCN) crosses the northern corner of the Siting Area. Siting Area YN3b principally falls within one large arable field but also includes part of a small-scale arable field to the north west. The fields are bounded by intensively managed hedgerows with some hedgerow trees; field trees are also present. The Hurns Gutter watercourse runs approximately 120m to the east of the Siting Area.</p>
B.YN4a	<p>The description presented above in Option B.YN3a for the CSEC Siting Area and Corridor B are also valid for Option B.YN4a.</p> <p>The description presented above in Option A.YN4a for the substation Siting Area is also valid for Option B.YN4a.</p>
B.YN5a	<p>The description presented above in Option B.YN3a for the CSEC Siting Area and Corridor B are also valid for Option B.YN5a.</p> <p>The substation Siting Area YN5a is located to the south west of the A19 road and is bound on the east by Stripe Lane, which includes a several residential properties and a small caravan and camping ground. It spans several small to medium-scale flat arable fields, which are bound by a mix of intensively managed hedgerows with few hedgerow trees and overgrown hedgerows with frequent hedgerow trees. The fields extend to the south west and north west, outside the Siting Area, to the Hurns Gutter watercourse.</p>
B.YN5b	<p>The description presented above in Option B.YN3a for the CSEC Siting Area and Corridor B are also valid for Option B.YN5b.</p> <p>The substation Siting Area YN5b is located to the east of the A19 road with its southern boundary defined by the settlement of Skelton. It spans several medium to large scale flat arable fields, which are typically bounded by overgrown hedgerows with frequent hedgerow trees. The fields extend to the north and east, outside the Siting Area, to a network of woodland blocks and tree belts.</p>
C.YN4b	<p>The CSEC Siting Area (2TWC) comprises arable fields which are bound by a mix of field drains and managed and overgrown hedgerows with frequent hedgerow trees. There are a number of agricultural buildings in the north east corner.</p> <p>Corridor C mainly comprises agricultural land and the Forest of Galtres Golf Course. It crosses both the A19 road and the ECML. There are no settlements within Corridor C, with Beningbrough and Shipton by Beningbrough being located approximately 3km to the west and immediately to the east is Skelton. Immediately to the south east lies the small hamlet of Overton.</p> <p>The substation Siting Area YN4b, is located north of the River Ouse, spans several small to medium-scale arable fields, which are generally flat but become more sloping to the south where levels fall gradually to the River Ouse. The fields are bounded by a mix of managed, fragmented and overgrown hedgerows with hedgerow trees. To the north west is Overton Road. The small hamlet of Overton is located to the south west of the Siting Area.</p>
C.YN5a	<p>The description presented above in Option C.YN4b for the CSEC Siting Area and Corridor C are also valid for Option C.YN5a.</p>

Option	Overview
	<p>The description presented above in Option B.YN5a for the substation Siting Area is also valid for Option C.YN5a.</p>
C.YN5b	<p>The description presented above in Option C.YN4b for the CSEC Siting Area and Corridor C are also valid for Option C.YN5b.</p> <p>The description presented above in Option B.YN5b for the substation Siting Area is also valid for Option C.YN5b.</p>
D.YN6	<p>The CSEC Siting Area (2TWD) comprises arable fields which are bound by a mix of field drains and managed and overgrown hedgerows with frequent hedgerow trees. There are number of properties located within its boundary (but clipped out of the Siting Area).</p> <p>Corridor D largely comprises arable fields with a number of residential properties located within its boundary (but clipped out of the Corridor). Shipton by Beningbrough and Overton lie within approximately 3km to the west, Skelton lies immediately to the south west. Corridor D crosses the A19 road and its south western boundary is defined by the ECML. There are a number of watercourses (tributaries to the River Ouse) which cross Corridor D including Burtree Drain and White Sike Drain.</p> <p>The substation Siting Area YN6 is located to the north and north west of Skelton and to the south west of the A19. It spans several medium to large scale flat arable fields. The fields are typically bounded by managed hedgerows with hedgerow trees.</p>

4.4 York North Preferred Option

- 4.4.1 The Preferred Option Workshop concluded Option B.YN3b as the preferred option for York North, whilst acknowledging that there are a number of constraints that will be subject to further analysis and potential mitigation to reduce impacts.
- 4.4.2 Option B.YN5b was also considered favourably when compared to the other options, however there were constraints associated with this option that were not present for Option B.YN3b; these included the proximity of Siting Area YN5b to the settlement and Conservation Area of Skelton approximately 100m to the south, although it was acknowledged that the existing setting provides a reasonable level of screening from the wider area. There was also potential for impacts on the Forest of Galtres Golf Club directly to the north of Siting Area YN5b. From an ecological perspective, Siting Area YN5b was also considered less favourable than Siting Area YN3b due to the presence of Pennell's Drain within its boundary. In addition, the overhead line into Siting Area YN5b had the potential to impact several woodland areas to the north.
- 4.4.3 From a technical perspective, Siting Area YN3b provides sufficient space to accommodate the substation. A direct route largely clear of constraints exists to accommodate the proposed 400kV and 275kV overhead lines.
- 4.4.4 Option B.YN3b provides direct access from the A19 to Siting Area YN3b, with limited disruption to the local network. The access roads are out of the flood plain and it is considered that the potential effects on the NCN can be managed (or enhanced as part of proposals). The Siting Area is located away from any residential properties, with the closest being Overton Grange Farm approximately 800m to the south of the site.

- 4.4.5 There are three ponds within Siting Area YN3b; the presence of GCN has not been confirmed, however if GCN are confirmed, mitigation will be required to compensate for the impact of potential loss of habitat. Mitigation for GCN (including provision of terrestrial habitat to replace that lost) will be required if they are present within the ponds, and a European Protected Species (EPS) licence is likely to be required. To the north of Siting Area YN3b, Corridor B includes the Hurns Gutter watercourse, over which crossing of the 400kV and 275kV overhead line should be limited, where possible.
- 4.4.6 Siting Area YN3b is situated in open arable fields containing only approximately six mature isolated trees hence few valued landscape elements would need to be removed. While Siting Area YN3b is not considered to best align with the aims of the Horlock Rules when compared with the alternative options, the overall combination of Siting Area YN3b and Corridor B provide the preferred option with respect to the Horlock and Holford Rules combined and technical feasibility. Planting will be required to mitigate the potential visual impact of the York North substation, however, there is the opportunity to supplement the vegetation along Hurns Gutter, along the ECML railway and the road corridor. The Siting Area also lies furthest away from away from the River Ouse and the Ouse Valley LCT which has high landscape sensitivity.
- 4.4.7 Overall, given that Option B.YN3b offers the potential for one of the shortest and most direct routes from the 2TW 400kV overhead line (with Corridor B considered to best align with the Holford Rules); benefits from being sited away from settlements and individual residential properties; presents an opportunity to mitigate potential landscape and visual impacts through planting and careful siting, it was considered, on balance, to be the preferred option for York North. Careful mitigation should be integrated into the design of the Project as it is developed to limit visual impact.
- 4.4.8 While there are no significant planning policy considerations to differentiate between the options (i.e. Green Belt, mineral safeguarding or Aerodrome Safeguarding Area), it is acknowledged that engagement will be required with the relevant authorities to discuss existing designations.

5. TADCASTER OPTIONS APPRAISAL

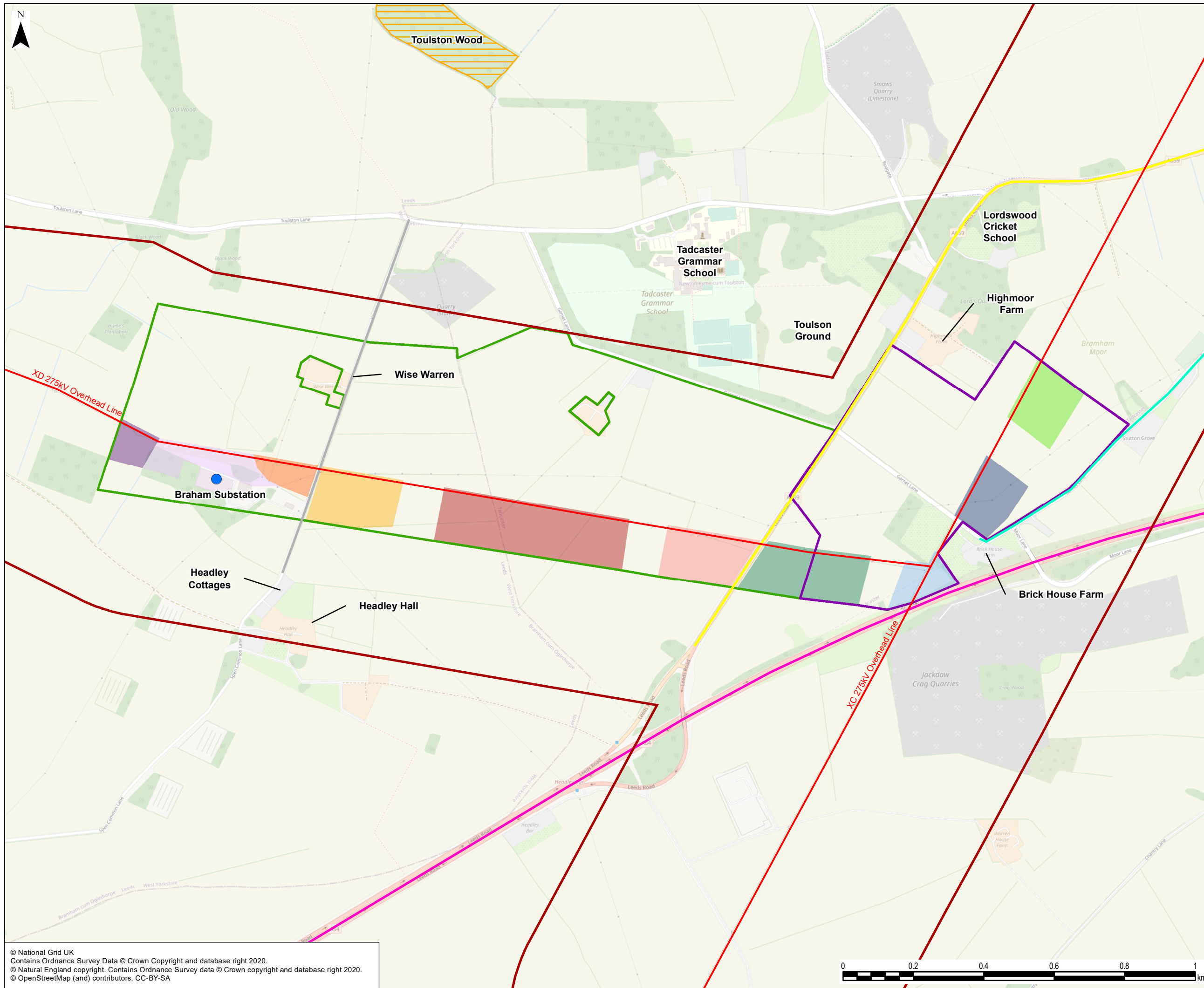
5.1 CSEC Siting Factors

5.1.1 The following factors were considered when identifying potential CSEC Siting Areas:

- Proximity to existing infrastructure: A key driver for identifying the location of Siting Areas for the CSECs substation was proximity to the existing XC and XD overhead lines and pylons associated with those overhead lines.
- Land Take: The CSEC Siting Area requires sufficient space to accommodate the CSEC footprint (approximately 50m x 40m).
- Existing environment: The Siting Area locations sought to avoid known environmental and socio-economic constraints, where possible.
- Guidelines, as adopted by National Grid, on the Siting and Design of Substations (the Horlock Rules).

5.2 Overview of Tadcaster CSEC Siting Areas

5.2.1 **Figure 5.1** presents the ten Tadcaster CSEC Siting Area options which are summarised in **Table 5.1**.



LEGEND

- Study Area
- Substation
- 275 kV Overhead Line
- Siting Area for underground cabling
 - XC
 - XD
- Siting Area for XC CSEC
 - XC Siting Zone 1
 - XC Siting Zone 2
 - XC Siting Zone 3
- Siting Area for XD CSEC
 - XD Siting Zone 1
 - XD Siting Zone 2
 - XD Siting Zone 3
 - XD Siting Zone 4
 - XD Siting Zone 5
 - XD Siting Zone 6
 - XD Siting Zone 7
- Constraints
 - Garnet Lane
 - Warren Lane
 - A64
 - A659
 - Ancient Woodland

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Scheme: YORKSHIRE GREEN PROJECT

Document Title: **FIGURE 5.1
 LOCATION OF SITING AREAS FOR CSEC
 ON THE XD AND XC OVERHEAD LINE**

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Table 5.1: Overview of Tadcaster CSEC Siting Areas

Siting Area	Overview
XC1	Siting Area XC1 is located directly north of the A64 and spans across the south eastern corner of an arable field and a recently planted area of woodland. Brick House Farm is located approximately 100m west of the Siting Area. An angle/ tension pylon sits in the northern section of the Siting Area.
XC2	Siting Area XC2, located to the north of the A64 and Garnet Lane, is wholly located within a medium-scale, arable field which sits at a slightly elevated level in relation to surrounding fields. The field is enclosed in part by fragmented hedgerow, with some hedgerow loss to the north east. The site is bounded to the south east and south west by Garnet Lane and roadside hedgerows. Tree cover nearby is within the grounds of Brick House Farm and the adjacent property which are located immediately to the south. The XC 275kV overhead line runs along the north western boundary of Siting Area XC2.
XC3	Siting Area XC3 is north of the A64 and straddles two medium-scale, arable fields with a field boundary formed by a drainage ditch. The north west boundary is formed by the A659. The pattern of arable fields extends out to nearby blocks and belts of trees. These partially enclose the landscape, which is more open to the north west. The XC 275kV overhead line runs along the north boundary of the site.
XD1	Siting Area XD1 is located north of the A64 within two medium-scale, arable fields and spans a field boundary formed by a drainage ditch. Landform slopes gently down to the south to the A64. The north west boundary is formed by the A659. The pattern of arable fields extends out to nearby blocks and belts of trees. These partially enclose the landscape, which is more open to the north west. The XD 275kV overhead line runs along the north boundary of the site.
XD2	Siting Area XD2 is located to the east of the A659 and spans two, small to medium-scale arable fields enclosed and separated by well-maintained hedgerows with few boundary trees. Landform slopes gently down to the west. The XD 275kV overhead line runs along the north boundary of Siting Area XD2.
XD3	The site spans over two medium-scale, flat, arable fields which are separated by a hedgerow. Landform slopes gently down to the north east. The XC 275kV overhead line runs along the north western boundary of the site. With the exception of the XC overhead line there are no tangible features which define the site.
XD4	Siting Area XD4 is set within an area of regular, small to medium-scale arable fields enclosed by well-maintained hedgerows with few boundary trees. Landform is generally flat. The site is located primarily within one medium-scale field but also includes a small area of the field adjacent to the north. Two overhead lines cross the site. Warren Lane forms the western boundary.
XD5	Siting Area XD5 is set within a small-scale pastoral field located to the north east of an existing substation. The field is enclosed by a mix of hedgerow and belts of woodland adjacent to the substation. The eastern boundary is form by Warren Lane. Landform is generally flat. The XD 275kV overhead line is located to the northern boundary.
XD6	Siting Area XD6 located within a narrow, small scale pastoral field located directly to the north of the existing Braham substation. The field is enclosed by a mix of hedgerow and trees and includes scattered trees and a small block of woodland. Siting Area XC6 also includes the north west part of the woodland located around Braham substation. The XD 275kV overhead line is located to the northern boundary.
XD7	Siting Area XD7 is located within the eastern corner of a largely flat, medium-scale arable field which also contains a rectangular area of trees planted in a grid. The field lies to the

Siting Area	Overview
	west of the substation and is enclosed by fragmented hedgerow. The XD 275kV overhead line is located to the northern boundary.

- 5.2.2 From a planning perspective, all Siting Areas are located in land designated as Green Belt and within a Mineral Safeguarding Area as defined in the draft Minerals and Waste Joint Plan.
- 5.2.3 While there are several residential properties located both between Siting Area XD1 and Siting Area XC1 as well as within the wider area, there are no clusters of five or more residential properties, which is the focus of the settlement and population appraisal. The only difference between the Siting Areas from a settlement and population perspective is the potential use of the field where Siting Area XD4 and Siting Area XD5 are located, which is used for educational purposes by the University of Leeds.
- 5.2.4 None of the Siting Areas are in proximity to any water courses or situated in areas of flood zone. Except for Siting Area XC2, all the Siting Areas are within a Source Protection Zone III area (the percentage of land covered varies from 46% to 100%).
- 5.2.5 All XC and XD Siting Areas provide sufficient space to accommodate the CSEC, with the key differentiator being the length of underground cabling required to connect the two CSECs. Siting Area XC1 also has the advantage over the other XC Siting Areas as the existing pylon can be reused limited the construction and cost. The shortest underground cabling section was identified for Siting Area XC1 to connect with Siting Area XD1 with a total approximate length of 0.4km. The longest underground cabling section would be to connect Siting Area XC3 with Siting Area XD7, which would require an approximate length of 2.5km.

5.3 Tadcaster Preferred Option

- 5.3.1 For biodiversity, the Siting Areas XD4, XD6 and XD7 were considered least preferable on the XD 275kV overhead line due to the presence of existing woodland that would be subject to either potential removal or impact. The Siting Areas on the XC overhead line were broadly considered as equal, however, an option that required the shortest underground cabling section would be considered most preferred to limit the loss of existing vegetation and potential impact to unrecorded archaeology.
- 5.3.2 Siting Areas XC2 and XC3 were least preferred from a landscape and visual perspective on the XC overhead line due to open views from Tadcaster and slightly elevated level in relation to surrounding landscape with Siting Area XC1 considered the most preferred. On the XD overhead line, Siting Area XD1 was most preferred from a landscape perspective due to the proximity to the A64.
- 5.3.3 Access to the Siting Areas varied, with Siting Area XC3 considered the least preferred on the XC overhead line due to limited access and the likely requirement of a new road. For Siting Area XC1 and Siting Area XC2, access is possible via existing tracks, although some unavoidable upgrade work may be required. On the XD overhead line, Siting Area XD7 and Siting Area XD3 were considered least preferred with access limitation also noted for Siting Area XD4, Siting Area XD5 and Siting Area XD6.

- 5.3.4 For all other technical disciplines there was no key preference of the location, but it was acknowledged, similar to biodiversity, that limiting the length of underground cabling would reduce the potential disturbance to unrecorded archaeology. From an engineering perspective Siting Area XC1 is preferred as the existing pylon can be reused and there will be no need for a replacement.
- 5.3.5 Siting Areas XC1 and XD1 have been selected as the preferred option for the CSECs. The close proximity of the Siting Areas to each other, limited environmental and socio-economic constraints and good access means the potential impacts to the environment and local community are limited. In addition, the underground cabling is expected to be limited to approximately 0.5km, minimising environmental impact and cost.

6. MONK FRYSTON OPTIONS APPRAISAL

6.1 Substation and Associated Infrastructure Siting Factors

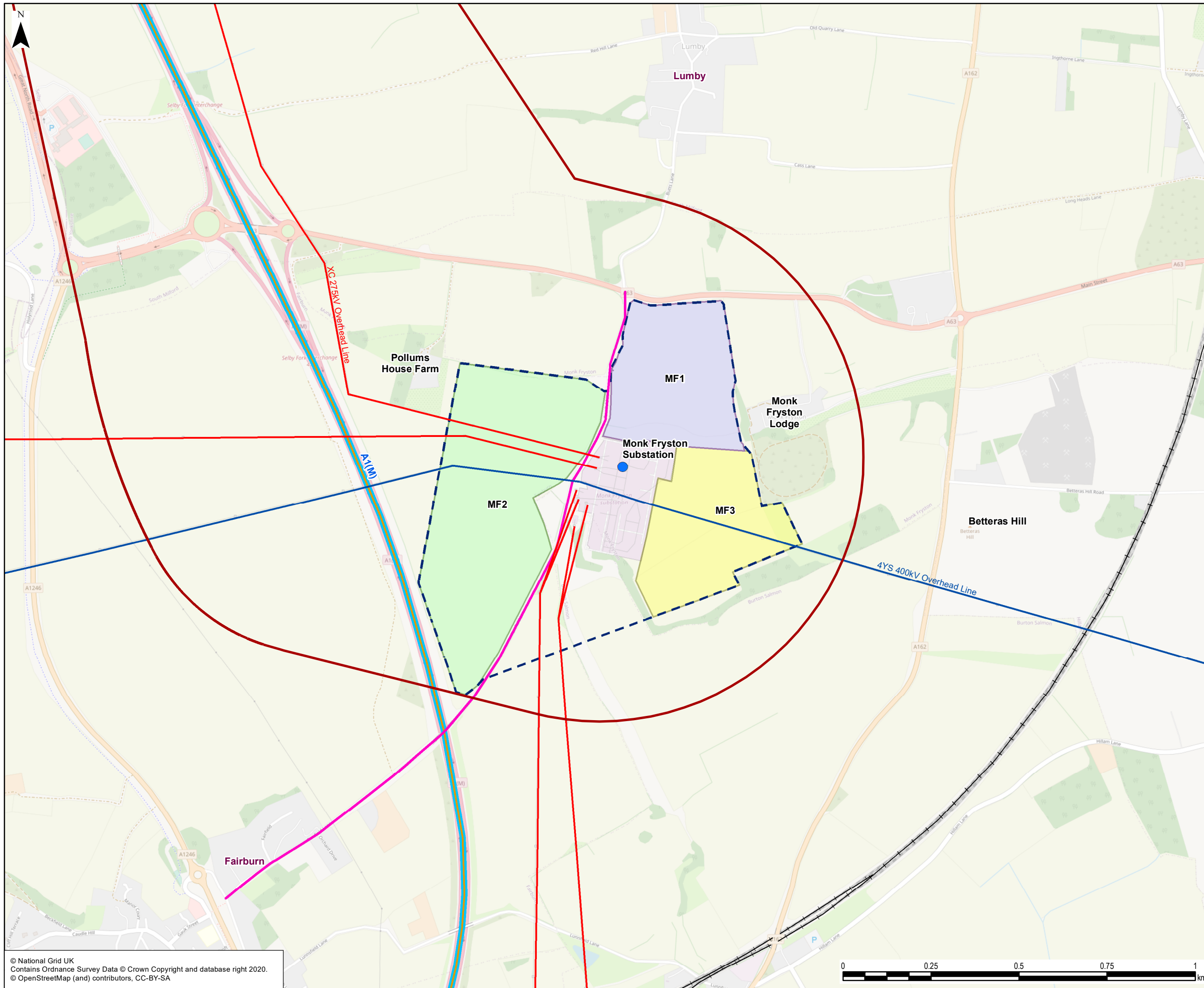
6.1.1 The following factors were considered when identifying potential Siting Areas for the substation and associated infrastructure:

- Proximity to existing infrastructure: A key driver for identifying the location of Siting Areas for the substation was proximity to the existing Monk Fryston substation.
- Land take: The site requires sufficient space to accommodate both the substation (approximately 350m x 210m) and CSEC (approximately 50m x 40m) footprint.
- Existing environment: The Siting Area locations sought to avoid known environmental and socio-economic constraints, where possible; and
- Guidelines, as adopted by National Grid, on the Siting and Design of Substations (the Horlock Rules).

6.2 Overview of Monk Fryston Substation and Associated Infrastructure Siting Areas

6.2.1 The location of each of the three Substation Siting Areas necessitates a different solution for the associated infrastructure, including location and type (i.e. realignment of existing infrastructure, new overhead line and/or underground cabling etc.). To facilitate a meaningful options appraisal the Project Team defined high level solutions for each Substation Siting Area. It is the combination of each Substation Siting Area (MF1, MF2 and MF3) and the bespoke associated infrastructure (located within the Associated Infrastructure Siting Area), which form the basis of the options appraisal.

6.2.2 **Figure 6.1** presents the three Monk Fryston Substation and the Associated Infrastructure Siting Areas which are summarised in **Table 6.1**.



LEGEND

- Study Area
- Substation
- 400 kV Overhead Line
- 275 kV Overhead Line

Monk Fryston Substation Extension Siting Zones

- MF1
- MF2
- MF3

Associated Infrastructure Siting Area

Constraints

- Rawfield Lane
- Trunk Road
- Motorway
- Railway Track

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Rev	Date	Description	GIS	Chk	App

nationalgrid

Scheme: YORKSHIRE GREEN PROJECT

Document Title: **FIGURE 6.1
LOCATION OF SITING AREAS FOR THE
NEW MONK FRYSTON SUBSTATION**

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Figure 6.2: Overview of Monk Fryston Substation and CSEC Siting Areas

Siting Area	Overview
MF1	Siting Area MF1 is situated immediately north of the existing Monk Fryston substation. The A63 defines the northern boundary of the Siting Area and Rawfield Lane defines the western boundary. The majority of the site is located within a medium-scale arable field but also contains a fragmented hedgerow and part of an adjacent arable field. To the east is Monk Fryston Lodge (a Grade II listed building) with associated buildings. Fields/ paddock to the south of the grounds extend into a pastoral field and is then partially bounded by an existing substation.
MF2	Siting Area MF2 is bounded to the north by two smaller scale arable fields. To the west there is no defined boundary to the site; the field continues north west to Pollums House Farm and west to the A1(M) road corridor. To the east is Rawfield Lane and to the south the bridge over which Rawfield Lane passes over the A1(M). The existing Monk Fryston substation is located on the opposite side of Rawfield Lane to the east.
MF3	Siting Area MF3 is located immediately east of the existing Monk Fryston substation and spans across a small to medium-scale pastoral and arable field and contains a young, fragmented hedgerow. The northern boundary of the site stops short of a hedgerow field boundary and arable field beyond. To the east is a small area of maturing woodland associated with Monk Fryston Lodge and a medium-scale arable field and to the south a mature belt of deciduous trees and understory.

- 6.2.3 From a planning perspective, all Siting Areas are located in land designated as Green Belt and within a Mineral Safeguarding Area as defined in the draft Minerals and Waste Joint Plan.
- 6.2.4 There are a number of residential properties located within the vicinity of the Siting Areas, namely Monk Fryston Lodge to the east of Siting Areas MF1 and MF3 which includes several residential properties within its grounds and Pollums House Farm to the north west of Siting Area MF2. As these properties do not represent a cluster of five or more residential properties they are not considered from a settlement and population perspective.
- 6.2.5 None of the Siting Areas are located within proximity to any water courses, situated in areas of flood zone or within source protection zones. All Siting Areas would result in the permanent loss of Grade 2 Agricultural Land, which covers the entire area of all Siting Areas.

6.3 Monk Fryston Preferred Option

- 6.3.1 Following detailed discussions on all three potential Substation Siting Areas (and associated infrastructure) at Monk Fryston as part of the Preferred Option Workshop, Substation Siting Area MF3 was selected as the preferred option. Given the need to site the new Monk Fryston 400kV substation adjacent to the existing substation, the siting decision was steered by the technical feasibility of the Project taking into account potential environmental and socio-economic impacts.
- 6.3.2 Potential impacts associated with physical environment, tourism and recreation, settlement and population and land use were considered to be indiscernible across all three Siting Areas.
- 6.3.3 All three Siting Areas comprise largely pasture and arable land and are located within the Fairburn and Newton Ings SSSI Impact Risk Zone. There are two ponds in the

area, one adjacent to the tower located at Beterras Hill which has the potential to be impacted by all options. An additional pond located to the south east of the existing substation may be indirectly impacted by Siting Areas MF2 and MF3. The presence of GCN in the ponds is unknown and should be established through surveys.

- 6.3.4 For traffic and access, while it was acknowledged that access arrangements would vary for each Substation Siting Area, all were considered feasible with access from Rawfield Lane. For Substation Siting Area MF3 access would be required adjacent or through the existing Monk Fryston 275kV/400kV substation, but given this area is owned by National Grid this was not perceived as an issue.
- 6.3.5 There is one planning application associated with Substation Siting Area MF3 (2020/0594/FULM), within which associated infrastructure for Substation Siting Areas MF1 and MF2 will be located. It is understood that National Grid's requirements for the area will take preference and there will be an opportunity to work collectively with the proponent. As such, planning it is not considered to be a constraint to all Substation Siting Areas.
- 6.3.6 With regards to heritage, Siting Area MF3 was not considered the preferred option given that Siting Area MF1 has a lower potential to impact on assets. The key constraint for heritage is the Monk Fryston Lodge, a Grade II listed building and associated gate piers at the entrance to the property. The lodge is located on the eastern boundary of Siting Areas MF1 and MF3. While the installation of the substation and associated infrastructure is not expected to result in physical impacts to the lodge, the setting may be compromised. However, it is considered with appropriate planting and landscaping this could be mitigated to limit significant effects.
- 6.3.7 For landscape and visual all three Substation Siting Areas were considered broadly within the same degree of impact with the potential for locally significant visual effects. The proximity of the substation and associated infrastructure with respect to Monk Fryston Lodge was of concern as it may limit the ability to screen and plant around the substation and associated infrastructure from a landscape and visual perspective with the necessary offset.
- 6.3.8 Substation Siting Area MF3 provides a location where a less complex and more cost-effective solution to connect with existing infrastructure can be realised. From an engineering perspective Substation Siting Area MF3 was considered the preferred option.
- 6.3.9 Taking on board input from all the environmental, socio-economic and technical specialists and considering the potential impact and possible mitigation required it was considered, on balance, that Substation Siting Area MF3 provided the optimal location when compared against Substation Siting Areas MF1 and MF2. As stated above, the technical feasibility was considered to be a decisive aspect of the siting appraisal.

7. GRADUATED PRELIMINARY ROUTE SWATHE AND GRADUATED PRELIMINARY LOCATIONS

- 7.1.1 Following the selection of the preferred options, two graduated preliminary route swathes were developed for the overhead line route at York North and graduated preliminary locations for the CSECs, substations and associated infrastructure (refer to **Figure 7.1**, **Figure 7.2**, **Figure 7.3** and **Figure 7.3**). The darker area indicates the preferred location of the infrastructure with the final location to be determined following potential modifications based on public and stakeholder feedback.
- 7.1.2 Two options are provided at this stage for the two proposed 275kV overhead line routes in York North as further investigation and analysis is required. In Option 1 one of the new 275kV overhead lines from the proposed substation would cross the River Ouse with the other running parallel to the northern side of the ECM railway line. This option would enable the dismantling of up to 2.5km of the existing XCP 275kV overhead line, which would bring benefits to the landscape and visual amenity. For Option 2 the two new 275kV overhead lines would broadly run parallel with the ECM railway line; one would be located to the northern side of the ECM railway and the other to the south. This option would limit any potential ecological impacts on the River Ouse, however it would only enable the dismantling of up to 700m of the existing XCP 275kV overhead line, limiting the potential beneficial impacts to landscape and visual amenity.
- 7.1.3 Option 1 will be subject to further investigation and analysis of the potential ecological impacts associated with crossing of the River Ouse through further data collection and consultation with Natural England.

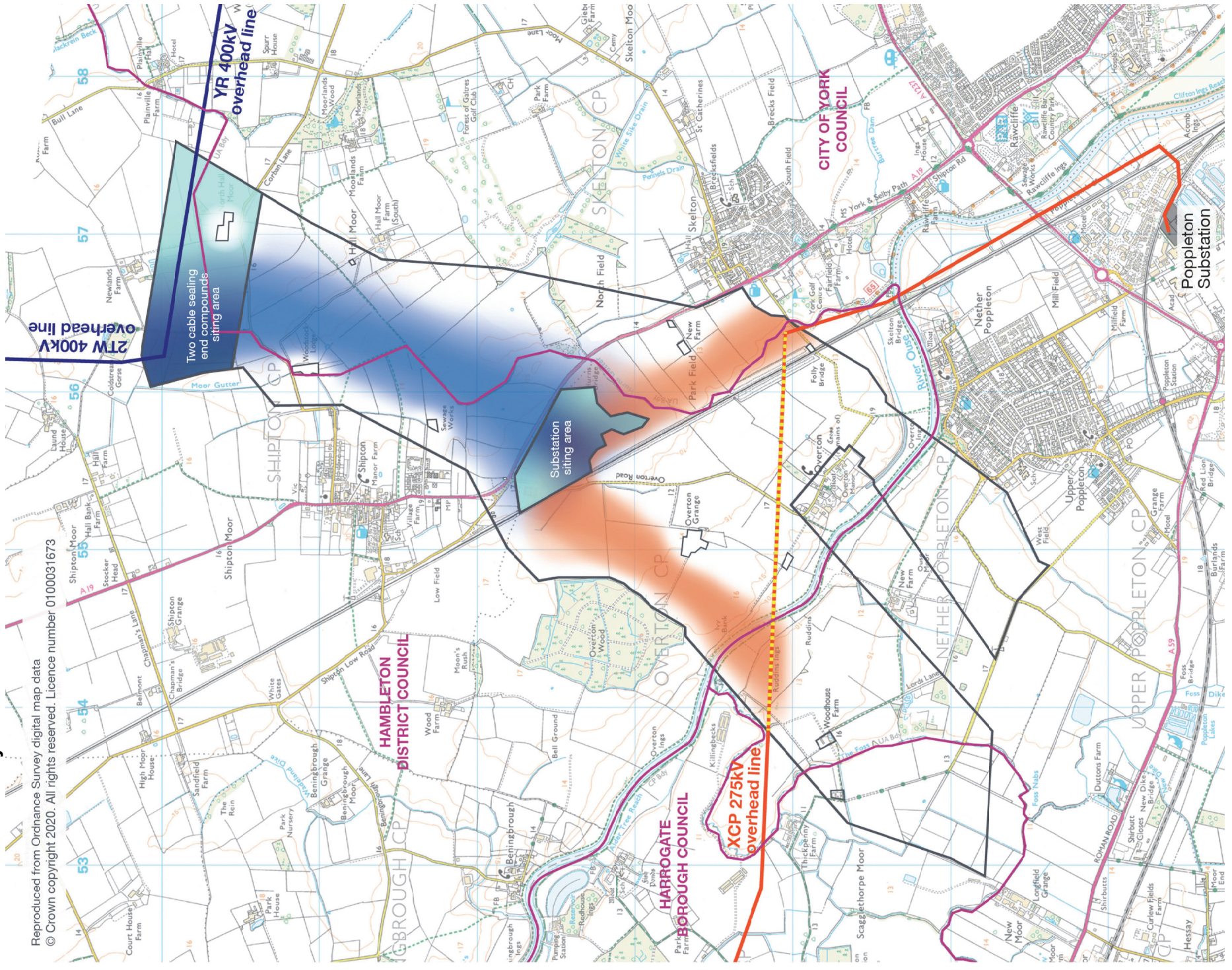
Figure 7.1: Option 1 - Graduated Preliminary Route Swathe and Substation Locations of CSEC and Substation at York North

nationalgrid

Yorkshire GREEN Works

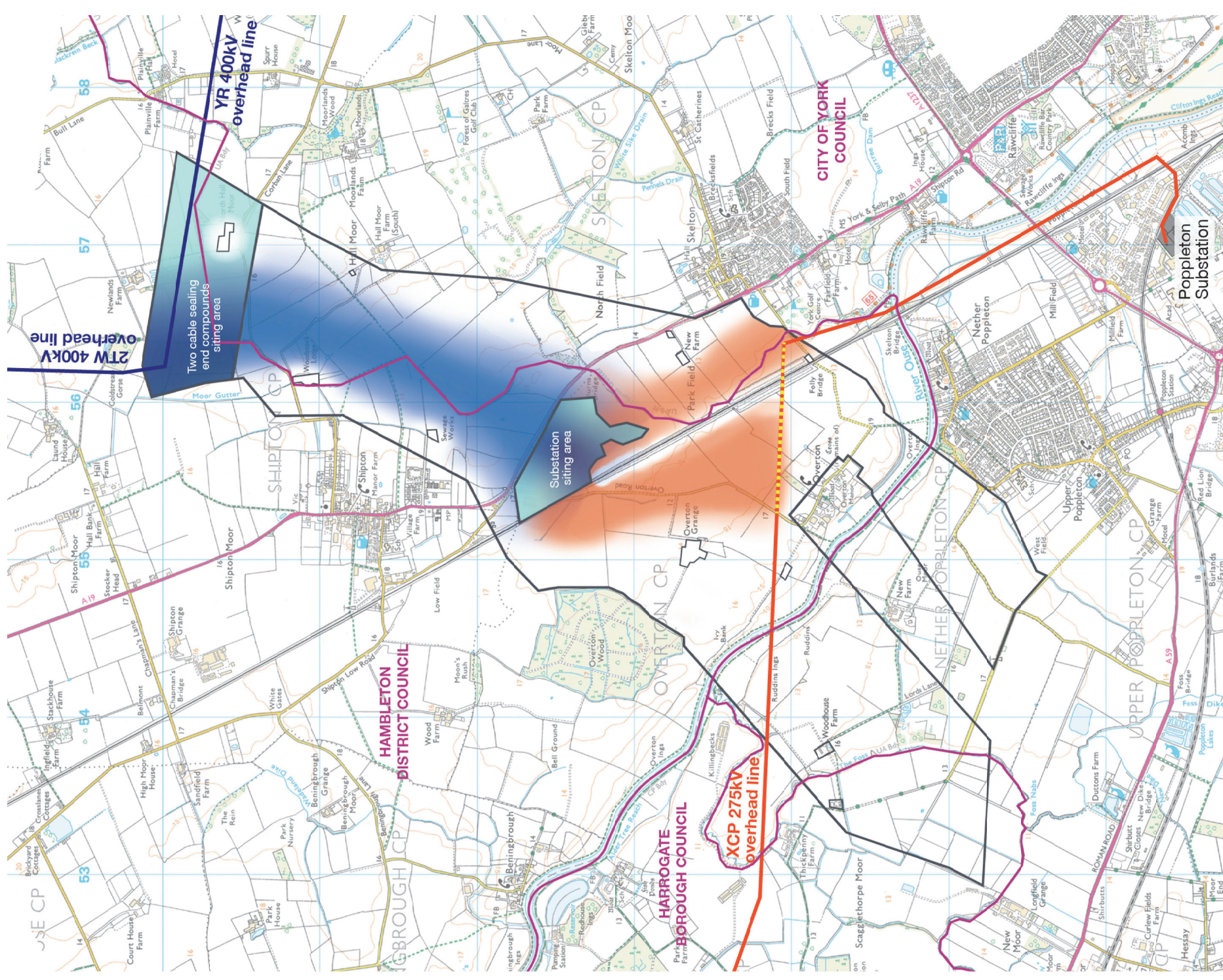
North west of York graduated swathe - option 1

Key	
	Potential alignment of new 400kV overhead line
	Potential alignment of the two new 275kV overhead lines
	Preliminary location of infrastructure, including the substation and cable sealing end compounds
	Existing properties
	Existing 400kV overhead line
	Existing 275kV overhead line
	Partial removal of the existing 275kV Poppleton to Monk Fryston overhead line
	District boundary
	North west of York corridor boundary



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Figure 7.2: Option 2 - Graduated Preliminary Route Swathe and Graded Preliminary Locations of CSEC and Substation at York North



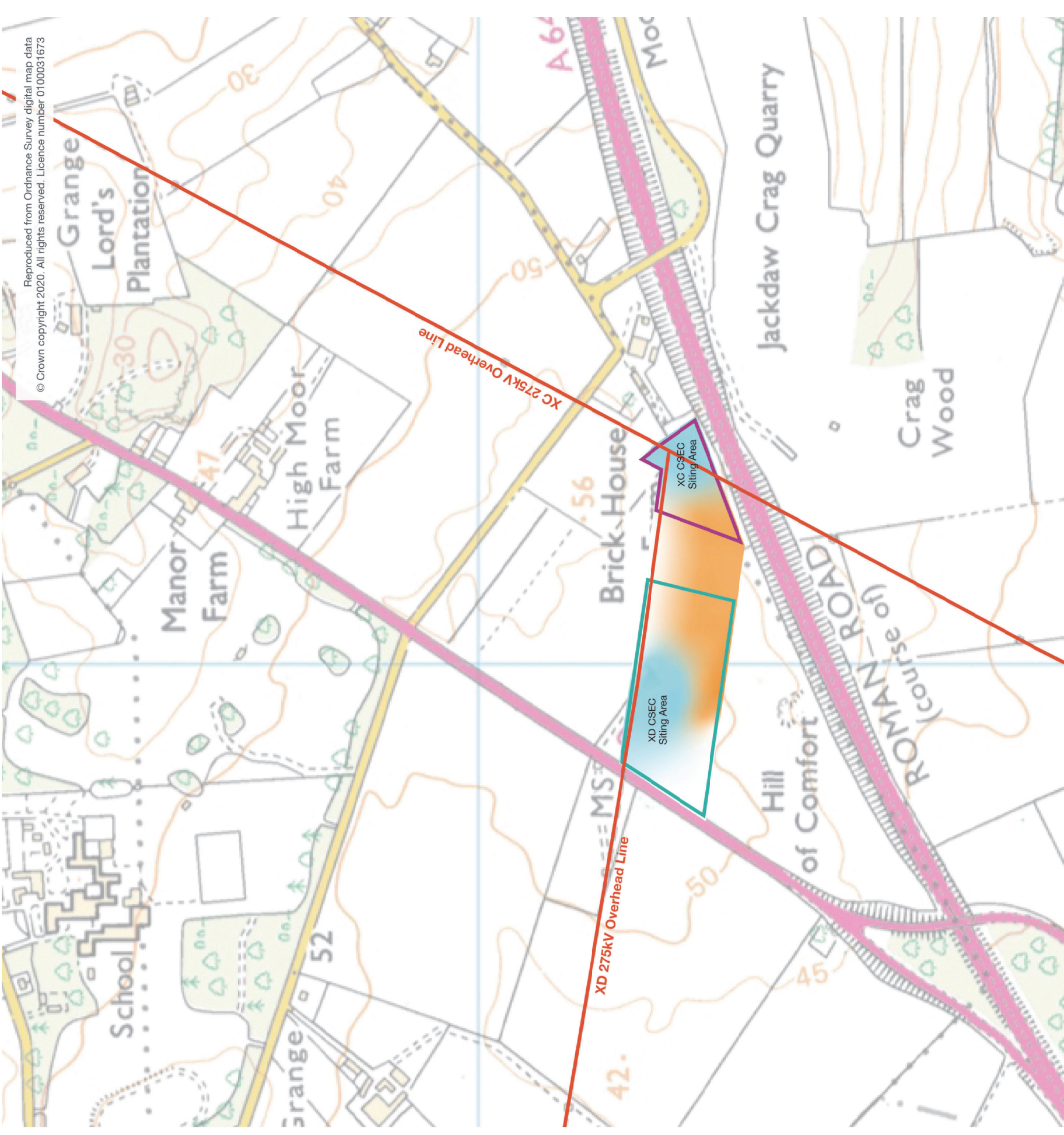
nationalgrid

Yorkshire GREEN Works

North west of York graduated swathe - option 2

Key	
	Potential alignment of new 400kV overhead line
	Potential alignment of the two new 275kV overhead lines
	Preliminary location of infrastructure, including the substation and cable sealing end compounds
	Existing properties
	Existing 400kV overhead line
	Existing 275kV overhead line
	Partial removal of the existing 275kV Poppleton to Monk Fryston overhead line
	District boundary
	North west of York corridor boundary

Figure 7.3: Graduated Preliminary Locations of the CSECs and Underground Cabling at Tadcaster



nationalgrid

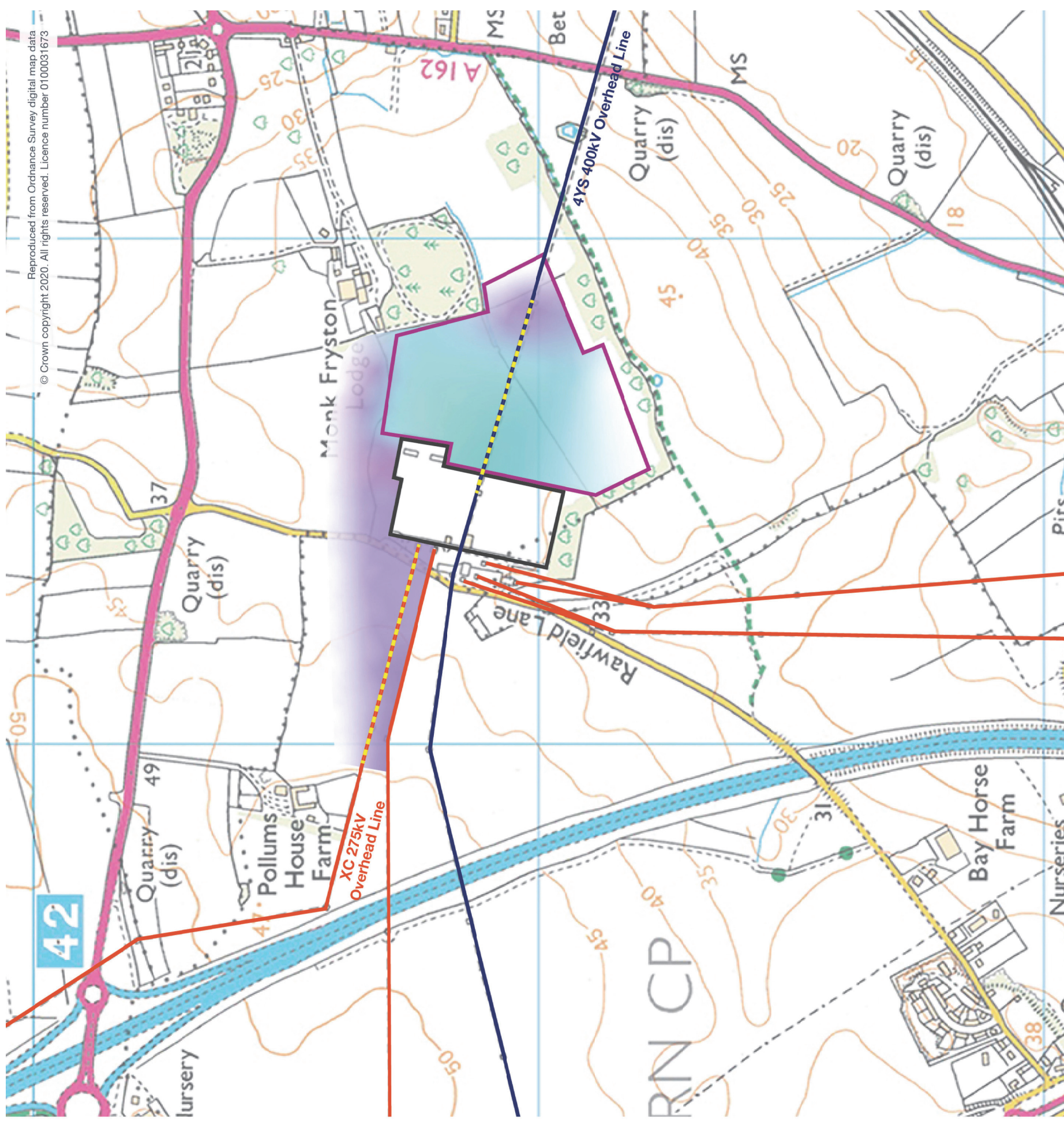
**Yorkshire GREEN Works
Tadcaster area**

Key	
	Location of proposed new cable sealing end compound
	Location of proposed underground cabling
	Existing 275kV overhead line
	Proposed XD cable sealing end compound location
	Proposed XC cable sealing end compound location



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Figure 7.4: Graduated Preliminary Locations for a Proposed Substation and Associated Infrastructure at Monk Fryston



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nationalgrid
Yorkshire GREEN Works
Monk Fryston
substation area

Key	
	Proposed location of associated infrastructure connecting to proposed, new MF3 substation
	Proposed location of new substation
	Existing 275kV overhead line
	Existing 400kV overhead line
	Partial removal of the existing 275kV XC/XCP overhead line (Poppleton to Monk Fryston)
	Partial removal of the existing 400kV 4YS overhead line (Monk Fryston to Eggborough)
	Proposed MF3 substation location
	Existing Monk Fryston substation



8. NEXT STEPS

- 8.1.1 The preferred Corridor and Siting Areas identified in this report, in conjunction with the other elements of the Options Identification and Selection process, will be kept under review throughout the development of the Project. Surveys will be undertaken to obtain baseline data, which will be used to inform the further development of the Project. Public consultation and engagement with key stakeholders, including landowners, will be undertaken and the feedback from consultation used to further inform the design.