Yorkshire GREEN Project

Environmental Impact Assessment

Preliminary Environmental Information Report
Volume two: Chapter 2 Project Need and Alternatives

October 2021

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2. Project Need and Alternatives

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2. Project Need and Alternatives

2.1 Need for the Project

2.1.1 Currently Great Britain is home to the largest operating offshore wind capacity in the world. The updated Offshore Wind Sector Deal[1] seeks to increase energy delivery by up to 40GW by 2030. In June 2019, legislation requiring the UK Government to reduce the UK's net emissions of greenhouse gases by 100% relative to 1990 levels by 2050 was implemented[2]. The increase in renewable energy generation, in line with the Government's Net Zero targets, is driving a need to expand the capacity of National Grid's transmission system.

2.1.2 With power flows set to double within the next ten years as a result of offshore wind developments, other sources of clean energy and expanding interconnection capacity in both Scotland and north-east England, the Project would contribute towards strengthening the National electricity transmission network so that it can accommodate this growth. Reinforcement would ensure that the network is not overwhelmed, and that potential future pressures on the network are relieved in the north and north-east of England, whilst balancing supply and demand.

2.1.3 Without additional reinforcement, the existing transmission system would become overloaded. To stop these overloads from happening, National Grid ESO would need to constrain power generation. This would involve paying generator(s) not to produce power in one area to reduce congestion around a particular point of the transmission network. Such action could result in significant costs to consumers.

2.1.4 As a result, it is necessary and economical to invest in network reinforcement in the long term, and critically to ensure that the Project is operational by 2027. This would enable an increase in clean energy transfers, relieving network congestion and avoiding constraint costs which are likely to occur at the end of 2027 from projects connecting to the network at that time.

2.1.5 The following customers are reliant on the Project:

- Scotland England Green Link (SEGL1) - 2GW offshore link from Torness in East Lothian to Hawthorn Pit in County Durham;
- Continental Link Multi-Purpose Interconnector- 1.8GW interconnector (with Norway);
- Atlantic Superconnection - 1GW interconnector (with Iceland) at Creyke Beck near Hull; and
- Hornsea P4 – 2.6GW offshore wind farm at Creyke Beck near Hull.

[1] Department for Business, Energy & Industrial Strategy (2019). Industrial Strategy: Offshore Wind Sector Deal. [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/790950/BEIS_Offshore_Wind_Single_Pages_web_optimised.pdf

[2] UK Government (2019). The Climate Change Act 2008 (2050 Target Amendment) Order 2019

2.2 Project development process

2.2.1 Regulation 14(2)(d) of the EIA Regulations requires that an Environmental Statement (ES) should include at least, '*a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment'*. The approach to the design and routeing of new electricity transmission lines including the consideration of alternatives to the Project, such as alternative routes, has followed National Grid guidance[3]. The key stages in this process are outlined below with a brief explanation as to what work is undertaken at each stage.

- **Strategic proposal**: At this stage National Grid explores whether new infrastructure needs to be built. A Project Need Case document is prepared, summarising the requirements at this early stage, and explaining the technical network modelling undertaken to determine the scope of the Project and its underlying assumptions and parameters. Different technologies and geographical connection points are considered to identify strategic options which are appraised in relation to high-level environmental, socio-economic and technical issues as well as capital and lifetime costs. The outcomes of the process at this early stage are presented in a Strategic Options Report (SOR) (**Section 2.3**).
- **Options identification and selection**: At this second stage, National Grid identifies a broad study area, within which potential route corridor options are identified using the outline engineering design (from the Strategic Proposal phase) taking into account a variety of environmental and other constraints. Within each potential route corridor a Preliminary Route is identified in accordance with a mitigation hierarchy which avoids constraints and incorporates mitigation measures where constraints cannot be avoided. Preliminary Routes are indicated by a graduated 'swathe', darker towards the centre, to indicate the preferred route within the corridor. For non-linear infrastructure, such as electricity substations, a similar process is followed, with 'siting studies' used to identify suitable locations (known as 'siting areas'), again based upon a combination of design requirements and the need to avoid major constraints. The Preferred Corridor and Preliminary Route, as well as any potential siting areas for non-linear infrastructure are consulted on with the public. The swathes and siting areas allow flexibility such that feedback can be considered and the design developed accordingly. The key outputs from this stage are a Corridor and Preliminary Routeing and Siting Study and an Interim Consultation Feedback Report (**Section 2.4**).
- **Defined proposal and statutory consultation**: The Preliminary Route and siting areas for non-linear infrastructure design are developed further using the feedback from the non-statutory consultation as well as additional environmental baseline information gathered since the Preliminary Route was identified. The defined proposal is described in this PEIR (**Section 2.5** and **Chapter 3: Description of the Project**) and will be subject to statutory consultation in accordance with Sections 42, 47 and 48 of the Planning Act 2008 and Regulation 12 of the EIA Regulations. An Interim Consultation Report will set out the feedback received and how National Grid has responded to this in finalising the Project which is taken forward in the application for development consent.

[3] National Grid (2021). Our Approach to Consenting.

- **Assessment and land rights**: Feedback from statutory consultation informs further refinement of the Project design. The Preliminary Route is developed further to form the detailed route alignment and/or site proposal for which National Grid will submit an application for development consent, including a draft Development Consent Order (DCO). The results of the EIA will be reported in the ES which will be submitted in support of the application. Agreements to acquire land and rights in land through voluntary negotiation will also be sought with affected landowners.

2.2.2 The following sections provide a summary of the work undertaken to date for the above stages completed so far for the Project. This part of the PEIR does not seek to provide a full chronological summary of the various assessments and work that has been undertaken over a number of years. Information relating to the development of the Project will be published as part of the statutory consultation stage.

2.3 Strategic proposal

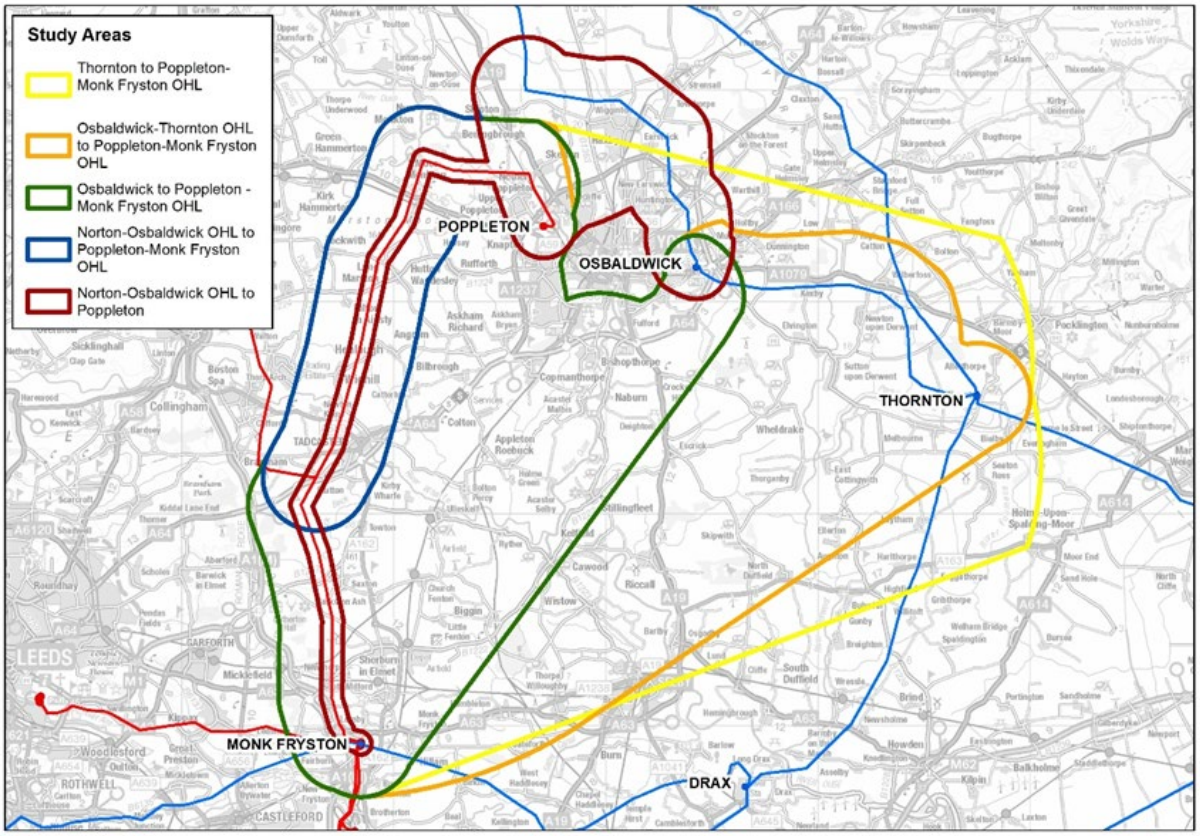
2.3.1 In 2019, several strategic options were identified which were deemed to meet National Grid's need ('the Project Need Case'[4]) to reinforce the electricity transmission network in Yorkshire, as well as to enable National Grid to meet its statutory duties. Initially a 'long list' of over 300 options was identified connecting a number of potential 'start' and 'end' points comprising both substations and existing overhead lines. Both overhead lines and underground cable connections were considered. During the appraisal process the use of gas insulted line was discounted as this would have a potentially greater climate change impact than alternative technologies. In addition, National Grid has a commitment not to implement new Sulphur hexafluoride (SF6) into its transmission system. Sulphur hexafluoride (SF6) is a highly effective electrical insulator used in high-voltage electrical applications. It is a greenhouse gas that has a global warming impact of 22,800 times that of carbon dioxide. The strategic options were subject to a strategic options appraisal to identify a short list of 105 options and a Strategic Proposal was then identified for the Project.

2.3.2 In identifying the Strategic Proposal options which allowed the use of existing infrastructure in order minimise environmental effects and cost and take account of National Grid's statutory duty to have regard to amenity under section 38 of the Electricity Act were preferred. Wholly new infrastructure is only considered where existing infrastructure cannot be technically or economically upgraded to meet system security standards and regulatory obligations. Therefore, a number of the strategic short list options requiring entirely new infrastructure and longer routes were discounted on this basis.

2.3.3 Five main strategic options which included a combination of new infrastructure and upgrades to existing infrastructure were identified. These comprised new routes connecting between 'start' points (the existing Norton-Osbaldwick overhead line, Thornton Substation or Osbaldwick-Thornton overhead line) and either Poppleton Substation or the existing overhead line between Poppleton and Monk Fryston. All options would require works to the existing overhead line between Poppleton and Monk Fryston. **Figure 2.1** below illustrates these potential strategic options.

[4] National Grid (2020) Central Yorkshire Reinforcement Need Case.

Figure 2.1: 2019 Strategic Options connecting to Poppleton Substation or the Poppleton to Monk Fryston overhead line

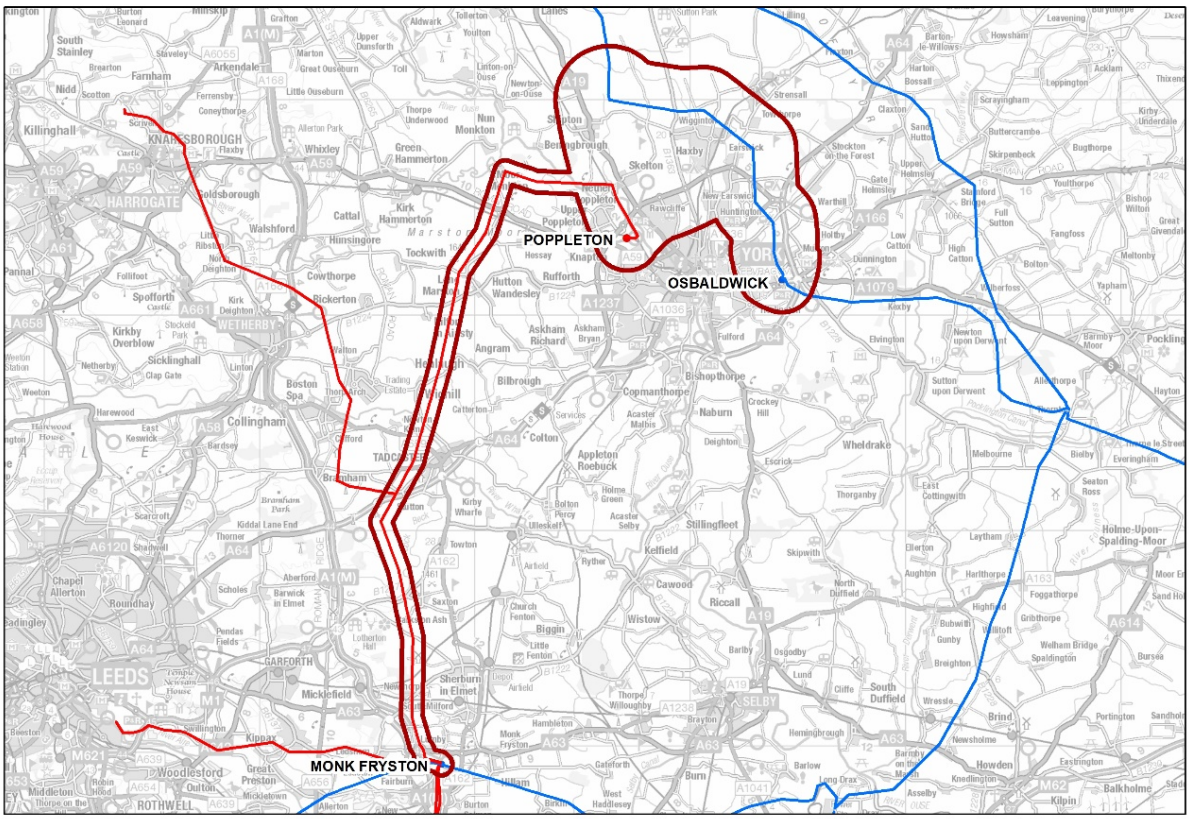


2.3.4 A number of the strategic options had 'start' points located to the east of Poppleton and York which would have required longer new build routes around the south of York resulting in the potential for greater environmental impacts, in particular landscape and visual impacts, as well as increased cost. Therefore, to minimise such effects options with 'start' points to the north or west of York were preferred.

- construction of a new 400kV double circuit overhead line approximately 6km in length connecting from a point on the existing Norton-Osbaldwick overhead line (2TW/YR 400kV) to Poppleton substation. This was considered to be the most economical, technically preferred option and in relation to environmental and socio-economic effects, having comparatively less impact than alternatives with longer routes; and
- reconductoring the existing 275kV overhead line from Poppleton to Monk Fryston (XC/XCP route) to increase the capacity of the existing route.

2.3.6 It should be noted that in appraising the short listed options no major environmental or socio-economic constraints were identified which would rule out a route. Consequently, the key differentiator resulting in the selection of the Strategic Proposal was the significantly shorter length of new route.

Figure 2.2 2019 Strategic Proposal



2.3.7 Further details of this process and the options which were discounted is provided in the Yorkshire GREEN Project Strategic Proposal Report (2019)[5].

[6]. It also found that the 2019 Strategic Proposal would not be able to be accommodate these additional customers, as the equipment at Poppleton and Monk Fryston Substations was not rated high enough for the additional capacity the customer connections required. Therefore a 'back check and review' process was undertaken to ascertain whether the 2019 Strategic Proposal remained the overall best option for the Project, resulting in six new variant strategic options being subject to options appraisal.

- Variant strategic option 1A: New 275kV or 400kV substation north of York, and a new 275kV substation at Monk Fryston.
- Variant strategic option 1B: New 275kV or 400kV substation north of York, and a new 400kV substation at Monk Fryston.
- Variant strategic option 2A: New 275kV or 400kV substation at 'Poppleton South', and a new 275kV substation at Monk Fryston.
- Variant strategic option 2B: New 275kV or 400kV substation at 'Poppleton South', and a new 400kV substation at Monk Fryston.

[5] National Grid (2019). Yorkshire Green Energy Enablement (GREEN) project: Strategic Proposal Report
[6] Future Energy Scenarios are produced annually by National Grid ESO in consultation with industry stakeholders to identify what 'credible futures' might exist, when considering the rate at which the UK may decarbonise, the impact of de-carbonisation of supply and how consumer behaviour will impact demand. National Grid (2019). Future Energy Scenarios. [Online] Available at: https://www.nationalgrideso.com/future-energy/future-energy-scenarios/fes-2019-documents

- Variant strategic option 3A: New 275kV or 400kV substation at 'Poppleton South', the partial realignment of the existing XC/XCP overhead line, and a new 275kV substation at Monk Fryston.
- Variant strategic option 3B: New 275kV or 400kV substation at 'Poppleton South', the partial realignment of the existing XC/XCP overhead line, and a new 400kV substation at Monk Fryston.

2.3.9 Of the six options, options 1A or 1B were preferred from an environmental perspective. Although these options would involve the construction a new substation in greenfield (and in the Green Belt) land to the north of York, the potential effects from this were considered to be outweighed by the potential for a shorter 400kV connection (compared to Options 2A, 2B, 3A, and 3B) as well as significantly greater certainty that a 400kV connection could be physically and technically achieved to the new substation (compared to Option 2A/2B). In addition local plan allocations and planning applications for new housing on land immediately south of the existing Poppleton 275kV substation would also constrain options 2A, 2B, 3A and 3B. Options 3A and 3B were least preferred as these options would result in new infrastructure in an area where there is currently none.

2.3.10 Taking into account technical requirements, a new Strategic Proposal (option 1B) was identified which would still construct a new 400kV double circuit overhead line from a point on the Norton–Osbaldwick overhead line, but would also include the following elements:

- construction of a new substation to the north of York which the new 400kV overhead line would connect into from the north;
- construction of a new substation at Monk Fryston to connect into the existing 275kV substation at this location; and
- reconducting and changes to the existing pylons and 275kV XC/XCP overhead line between Monk Fryston and Poppleton substations so that this overhead line would also connect to the new substation to the north of York.

2.3.11 Further details of the back check and review process and the options which were discounted are provided in the Yorkshire GREEN Strategic Proposal Back Check and Review (2020).[7] The Strategic Proposal was then taken forward to the Options Identification and Selection stage.

2.4 Options identification and selection

2.4.1 A Corridor and Preliminary Routeing and Siting Study ('the CPRS Study') was undertaken to further define the location of the proposed Project infrastructure within a defined Study Area[8]. An Options Appraisal was undertaken for proposed new infrastructure comprising substations, Cable Sealing End Compounds (CSECs) and overhead lines.

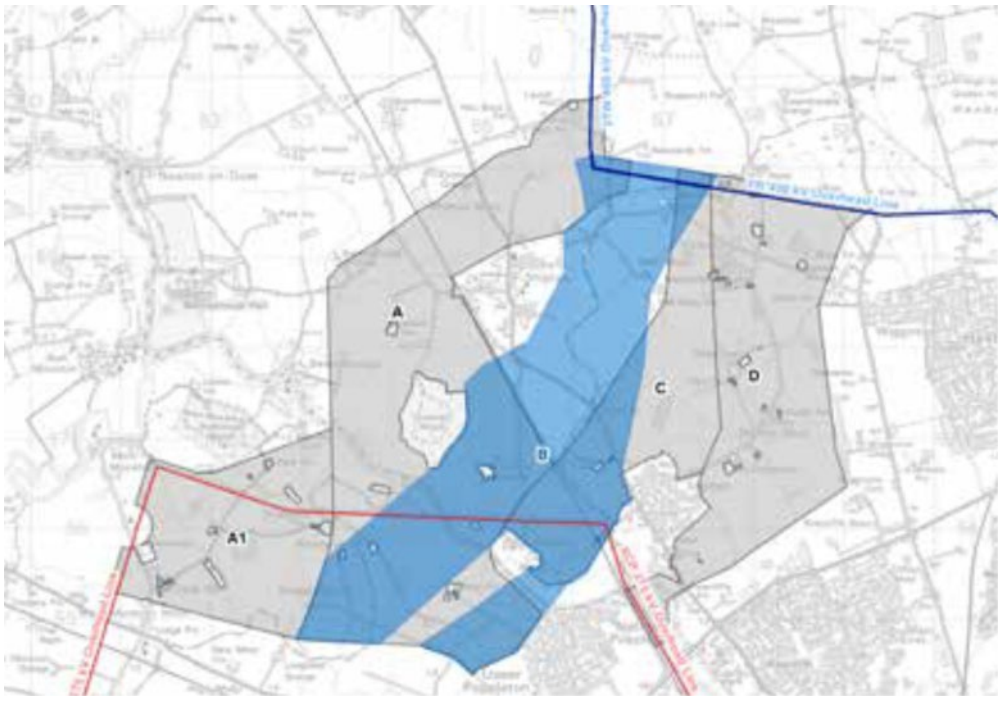
2.4.2 The CPRS Study focused on the routeing of new overhead lines and siting of the new infrastructure at three locations: north of York ('York North'), Tadcaster and Monk Fryston.

[7] National Grid (2020). Yorkshire Green Energy Enablement (GREEN) Project: Strategic Proposal Back Check and Review
[8] National Grid (2021). Corridor and Preliminary Routing and Siting Study. [Online] Available at: https://www.nationalgrid.com/uk/electricity-transmission/document/136186/download

2.4.3 A staged approach, undertaken in line with National Grid's Option Appraisal Guidance[3], comprised:

- Stage 1-Identify and Define Corridor and Siting Area Options: At York North, four corridors (A to D) were identified within which new overhead lines and CSECs would be located. Twelve substation siting areas for the York North Substation were identified within these four corridors. York North Substation has now been renamed and for the remainder of this report is referred to as Overton Substation. **Figure 2.3** illustrates the locations of the four route corridors (with the preferred corridor (B) shown in blue). Ten siting areas for two new CSECs at Tadcaster and three siting areas for a new substation at Monk Fryston were also identified. Further information on how these were identified can be found in Section 11 of the CPRS Study.

Figure 2.3 Potential route corridors



- Stage 2-Undertake Options Appraisal and Selection of Preferred Options: All options were appraised taking into account potential effects on the environment, the local community, relevant planning policy, including the National Policy Statements (NPS) for Energy (EN-1) and Electricity Network Infrastructure (EN-5), other existing and proposed developments as well as technical and engineering design information to agree a preferred corridor and siting areas.

[9] and Horlock Rules[10] and technical considerations. The 'graduated swathes' in the York North area indicated the broad areas where the preliminary overhead line route, locations for the CSECs and the

[9] National Grid (2021). The Holford Rules. [Online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf
[10] National Grid (2021). The Horlock Rules. [Online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf

Overton substation were likely to be located. The darker areas of the graduated swathe indicated a greater preference for the location of the required infrastructure. Similarly, graduated siting areas were also prepared for the proposed infrastructure at Tadcaster and Monk Fryston.

2.4.4 At stage 2 a preferred siting area was identified south of Shipton by Beningborough and adjacent to the East Coast Mainline (ECML) railway line as the preferred option for a new substation (Overton Substation) north of York, with Corridor B **(Figure 2.3**) selected as the preferred route corridor to connect the new 400kV and 275kV overhead lines (**Figures 2.4 and 2.5**).

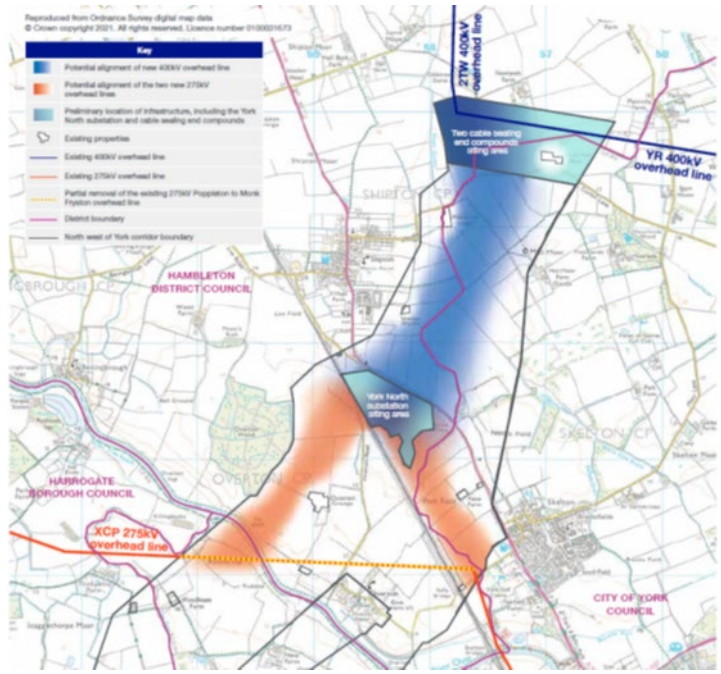
2.4.5 The preferred substation siting area was selected as it is located at least 800m from the nearest residential properties (Overton Grange Farm 800m south), is close to the A19, minimizing the need for traffic to route along minor roads and could be sited to avoid effects on the flood plain. The site itself comprises open arable fields and few valued landscape elements (such as mature trees) would need to be removed. Ponds are present within the siting area however it was considered that any effects from the loss of these ponds and any species, such as great crested newt that they may support could be mitigated through further survey and compensation measures.

2.4.6 Finally, whilst this siting area was not considered to best align with the aims of the Horlock Rules in isolation when compared with the alternative substation siting areas, the overall combination of the siting area and Corridor B was considered to provide the preferred option with respect to both the Horlock and Holford Rules as well as technical feasibility. Corridor B was best aligned with the Holford Rules as it would offer the potential for one of the shortest and most direct routes from the 2TW 400kV overhead line. Measures, such as planting would be needed to mitigate the visual effects of the substation but compared with other siting areas this location lies furthest away from the River Ouse and the Ouse Valley Landscape Character Type which has high landscape sensitivity.

2.4.7 For the proposed 275kV connections south from Overton substation to the existing 275kV XC/XCP overhead line between Monk Fryston and Poppleton, two options were identified and subject to consultation.

- Option 1 (**Figure 2.4**): This option would comprise a new section of 275kV overhead line running south-west from the proposed Overton Substation, east of Overton Wood and across the River Ouse with a second new section running approximately parallel to the eastern side of the ECML railway line. This option would enable the dismantling of up to 2.5km of the existing XCP 275kV overhead line.
- Option 2 (**Figure 2.5**): This option would comprise two new sections of 275kV overhead lines broadly parallel with the ECML railway line; one would be located to the eastern side of the ECML and the other to the west. This would enable the dismantling of up to 700m of the existing XCP 275kV overhead line.

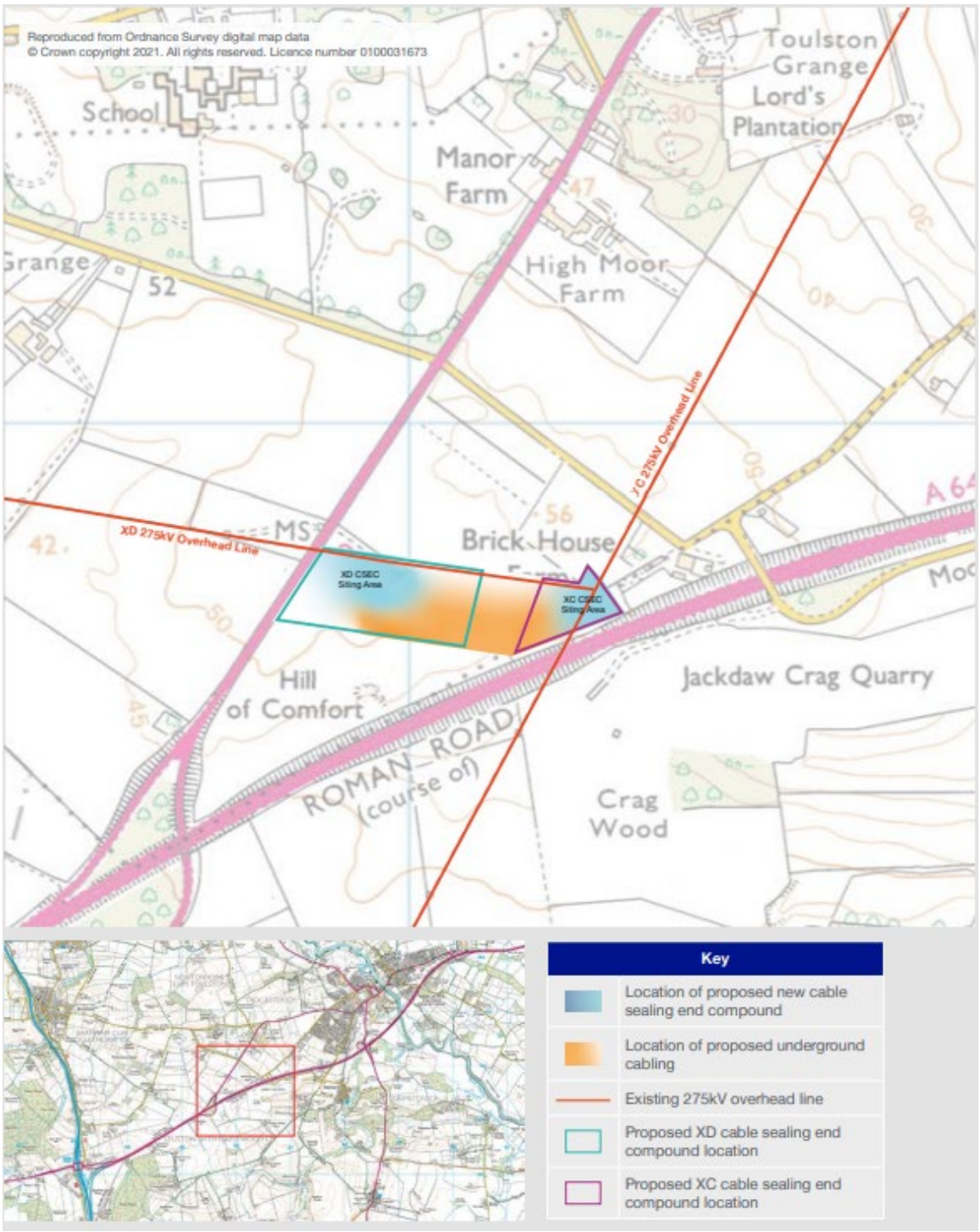
Figure 2.4 Preferred corridor: Option 1



2.4.8 Locations to the north of the A64 and east of the A659 were selected as the preferred locations for new CSECs at Tadcaster (**Figure 2.6**). Some alternative siting areas for the CSECs at Tadcaster were discounted as they would require the removal of or have impacts on existing woodland. The selected siting areas were also more preferred than some of the alternative siting areas in relation to landscape and visual impacts as some siting areas were in a slightly more elevated position in relation to the surrounding landscape with open views from Tadcaster. The preferred siting areas were also in

closer proximity to the A64 and therefore potentially less sensitive to change. In terms of access, the preferred siting areas were also considered more preferable within fewer constraints or need to implement new access. Finally, the preferred siting areas would require shorter lengths of underground cabling and were considered most preferred in this respect as this would limit the loss of existing vegetation and potential impact to unrecorded archaeology.

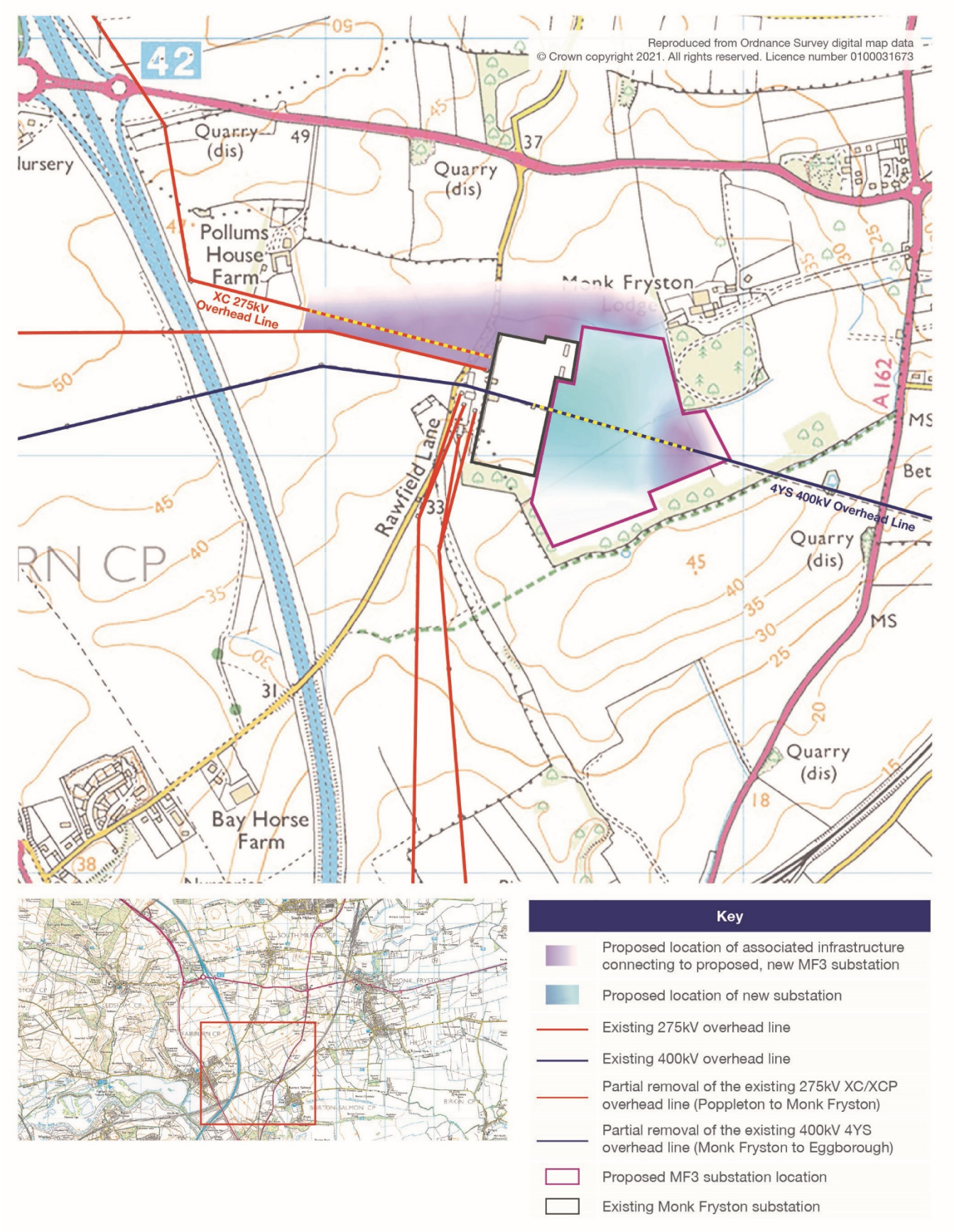
Figure 2.6 Preferred locations for CSECs at Tadcaster



2.4.9 A location to the east of the existing Monk Fryston substation was selected as the preferred siting area for the new substation at Monk Fryston (**Figure 2.7**). All potential siting areas considered were located within largely pasture and arable land and would

be likely to have similar impacts in terms of biodiversity and were considered to have broadly similar effects in relation to landscape and visual impacts. In relation to traffic and access all the siting areas considered could be accessed from Rawfields Lane although the selected siting area would require additional access adjacent or through the existing substation. The selected siting area was not the most preferred option in relation to impacts on the historic environment due to its proximity to, and potential effects on the setting of Monk Fryston Lodge, a Grade II listed building located to the east. However, it was considered with appropriate planting and landscaping these effects could be mitigated. From an engineering perspective the preferred siting area was considered the most preferred option due to its location adjacent to the existing substation and therefore located a substation in this location would require a less complex and more cost-effective engineering design.

Figure 2.7 Preferred location for Monk Fryston substation



2.4.10 Further information on the justification behind the selection of these preferred locations is provided in the CPRS Study[11].

2.5 Defined proposal and statutory consultation

2.5.1 Feedback from the non-statutory consultation events has been considered in the development of the new overhead line routes. With regards to Option 1 (**Figure 2.4**) and 2 (**Figure 2.5**) for the proposed 275kV connections south from Overton substation, more respondents supported Option 1 than Option 2, although both options faced some objections.

2.5.2 Consultation feedback in support of Option 1 referenced the decommissioning of the existing overhead line and removal of infrastructure close to Overton, although some feedback identified concerns about potential effects on Overton Wood and the wildlife it supports (an ancient woodland and Site of Importance for Nature Conservation), landscape and visual effects on the Green Belt and open countryside and effects on farm operations.

2.5.3 With regards to Option 2, some feedback highlighted concerns about the increase in the total number and concentration of pylons and wires in the area running parallel to ECML railway and how this could impact views from Overton. There were also comments that increasing the number of wires in a concentrated area, as would occur under Option 2, would increase the risk of bird collision. However, some feedback considered that locating all the infrastructure along one corridor either side of the railway could limit visual impacts as views from Overton village would be affected by new overhead line infrastructure running to the east of the railway under either option.

2.5.4 Following non-statutory consultation feedback, options were developed within the graduated swathes for the new overhead lines (**Figures 2.4** and **2.5**). Two overhead line options for the 400kV and 275kV overhead lines located within graduated swathes for preferred corridor options 1 and 2 were identified as follows.

- 400kV overhead line option 400-01: A 2.6km route running south from the 400kV Norton to Osbaldwick (2TW/YR) overhead line, including indicative CSEC locations, comprising nine new pylons and connecting to Overton Substation. This overhead line route would connect to the existing 2TW/YR overhead line from an existing pylon approximately 240m south of Coldstream Gorse woodland.
- 400kV overhead line option 400-02: A 2.6km route with nine new pylons connecting the 400kV Norton to Osbaldwick (2TW/YR) overhead line, including indicative CSEC locations, with Overton substation. One of the new pylons would replace an existing pylon and connect to the existing 2TW/YR overhead line from an existing pylon 210m south-west of Newlands Farm.
- 275kV overhead lines option 200-01 (within Option 2 graduated swathe, **Figure 2.5**): Two separate routes connecting from Overton Substation in the north and running parallel east and west of the ECML. The western route (1.5km) would comprise six new pylons connecting into the existing 275kV XC/XCP overhead line between Monk Fryston and Poppleton substations approximately 300m north of Overton village. The eastern route (1.3km) would comprise four new pylons connecting at an existing pylon 90m north of Stripe Lane and east of the ECML. Two pylons (and

[11] National Grid (2021). Yorkshire GREEN Project: Corridor and Preliminary Routeing and Siting Study. [Online]. Available at: https://www.nationalgrid.com/uk/electricity-transmission/document/136186/download

associated overhead conductors) on the existing XC/XCP route north and north-east of Overton would be removed.

- 275kV overhead lines option 200-12 (within Option 1 graduated swathe, **Figure 2.4**): Two separate routes would connect from Overton Substation in the north. The western route (2km) would comprise seven new pylons and connect into the existing 275kV XC/XCP overhead line between Monk Fryston and Poppleton substations at an existing pylon approximately 370m north of Woodhouse Farm. The eastern route (1.3km) would comprise four new pylons and connect to the existing overhead line at an existing pylon 90m north of Stripe Lane and east of the ECML. Under this option a section of the existing 275kV XC/XCP (Poppleton to Monk Fryston) overhead line, including seven pylons, would be removed from east of the ECML to north of Woodhouse Farm.

2.5.5 An Options Appraisal of the above was undertaken in accordance with National Grid's Option Appraisal Guidance[3] to identify a preferred alignment.

2.5.6 For the 400kV overhead line, the Options Appraisal identified that option 400-02 was the preferred overhead line alignment as, compared to option 400-01, it minimised landscape and visual effects and was more compliant with the National Policy Statement for Electricity Networks Infrastructure (EN-5) and the Holford Rules due to it maximising distance to residential properties and being straighter and more direct. Whilst this option would have greater landtake and require more construction work than option 400-01, and have slightly greater costs, it would be more compliant with policy, reduce effects on Woodstock Lodge (a wedding venue) and involved less sharp changes of direction for the angle pylon that was included in both options (Holford Rule 3: *Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers*).

2.5.7 Of the two options for the 275kV connections, the Options Appraisal identified option 200-12 as the preferred overhead line alignment.

2.5.8 Option 200-12, would be likely to have fewer landscape effects and fewer visual effects on properties in Overton compared with Option 200-01, as it would result in the removal of a greater length of existing overhead line infrastructure to the north of Overton. In addition, it would minimise effects on the National Cycle Network (NCN) Route 65 (on Overton Road) compared to 200-1 by avoiding a concentration of wirescape parallel to the railway. Option 200-01 would also result in the creation of 'wirescape' (i.e. the presence of several overhead wires or lines in views and across the landscape) as a result of the two new overhead lines running parallel and either side the ECML railway.

2.5.9 Option 200-12 has the potential for slightly worse ecological effects compared to option 200-01 as option 200-12 would cross the River Ouse (which is a candidate Site of Interest for Nature Conservation (SINC)). Effects could also result from the presence of Tansy Beetle, increased risk of bird collision during construction (when two overhead lines crossing the River Ouse would be present) and increased risk of hydrological and pollution impact. However, these effects could be minimised by locating pylons away from the River Ouse to minimise effects on any habitat along the river which may support aquatic species such as the Tansy Beetle. Fitting bird flight diverters would minimise effects on bird species. Pollution best practice management measures would also minimise the risk of pollution and contamination effects on the river during construction.

2.5.10 Historic environment effects would be very similar for both options with effects from option 200-12 being slightly greater because of increased risk of impacting buried

archaeological remains south of the River Ouse. Such effects could be minimised through further investigation of baseline conditions, using existing access tracks and roads to access the works and micro-siting of intrusive works.

2.5.11 Option 200-12 was also the preferred option from a technical and engineering perspective as it would enable the removal of a greater number of pylons that would have required upgrading or replacement if 200-1 had been taken forward.

Design review process

Change control process

2.5.12 With the initial preferred alignments identified, a change control process was implemented to refine the design and develop a preferred Project design to take forward for statutory consultation. These refinements were identified through stakeholder feedback, on-going discussions with landowners and reviews by the engineering and environmental team as additional baseline information was collated. The process was developed to ensure that each identified design change was effectively assessed by National Grid's specialist teams covering environment, design and construction and land rights.

2.5.13 The procedure was applied to all relevant design refinements associated with the Project. Design changes were raised in relation to the overhead line route, individual pylon locations, substation and CSEC locations and access routes.

2.5.14 Broadly the process comprised the following stages.

- Preliminary assessment: Each design refinement was initially reviewed by the National Grid to identify if there were valid reasons to consider the request. In order to be considered each design change request needed to be specific and locatable. If so, the design refinement was passed on to the next stage of the process. Some identified refinements were rejected at this stage if for example they were a duplication of another request already in the system being considered under the change control process or had been addressed at a previous stage (i.e. at the CPRSS or Strategic option stage).
- Engineering study: This examined the technical feasibility of the proposed change and if the change was considered feasible a revised engineering design was developed for consideration in the next stage of the process.
- Full assessment: The technical specialists reviewed all the relevant information, including the revised engineering design and independently came to a view as to whether the refinement should be made. For some changes additional information was provided if needed to inform the decision. For example, in some cases a more detailed assessment was undertaken by environmental specialists where there were concerns about the potential environmental implications of the change.

Assessment of identified design refinements

2.5.15 With the initial preferred design identified (option 400-02 and option 200-12), a number of refinements were made to develop the design in more detail to ensure the Project could be constructed and operated safely, to minimise the area of temporary and/or permanent land take and to avoid environmental effects wherever feasible which could then be used for the basis of optioneering to develop the design. Such refinements included:

- inclusion of construction compounds, construction working areas and permanent and temporary access routes;
- ensuring the Project boundary, the draft Order Limits, (**section 3.3**) included sufficient land to construct the Project but that this was minimised where feasible, for example, ensuring property boundaries were followed wherever possible;
- ensuring safe access, for example avoiding the routing of access beneath scaffolding where access routes join the public highway;
- minimising or re-orientating construction working areas to avoid effects on potential receptors where feasible, for example ensuring a minimum clearance of 9m to watercourses as required by the Internal Drainage Boards, moving working areas around pylons to avoid the need to divert or close a PRoW, or remove ponds;
- movement of the proposed construction compounds and access routes adjacent to Overton Substation to minimise loss of hedgerow;
- siting pylons to ensure safe clearances between features such as the ECML railway, River Ouse and the proposed overhead line; and
- refining a temporary diversion on the existing the 275kV Monk Fryston to Poppleton (XC/XCP) overhead line west of Monk Fryston Substation so that the temporary diversion could be routed to the south of Pollums House Farm locating all infrastructure to the south of this property.

2.5.16 For some aspects of the Project design alternative options were developed and appraised as part of the design review process. These are summarised as follows. For information on pylon locations see the figures provided to accompany **Chapter 3: Description of the Project**.

Pylon locations (connection of the YN overhead line with the existing Norton to Osbaldwick (2TW/YR) overhead line)

2.5.17 Further assessment identified the potential to improve the initial engineering design where the proposed 400kV YN overhead line connects to the existing 400kV Norton to Osbaldwick (2TW/YR) overhead line to allow the conductors to align correctly. Three options were identified:

- Option 1: Move YR040 east 15m and YN002 30m north.
- Option 2: Move YN001 west by 15m and YN002 slightly further north and
- Option 3: Move YR040 east 15m, YN001 east by 8m and YN002 north by 100m.

2.5.18 Option 2 was selected as the preferred option. Although for all three options landscape and visual effects were similar, Option 2 would result in no increase in pylon height and would be more compliant with the Holford Rules due to option 2 being a straight route. This option would also have the least impact on agricultural operations.

Alternative location for Overton Substation

2.5.19 A proposal for an alternative site located north of the village of Shipton for Overton substation, was suggested in consultation feedback. The alternative site suggested would not be large enough for the substation to be constructed and therefore this change was not made. Furthermore, siting the substation at the alternative location would require changes to the routeing of the overhead lines which would pass close to

surrounding villages, including Skelton which would be less compliant with the Holford and Horlock Rules than the current Project proposals. The proposed Overton Substation location offers the potential for one of the shortest and most direct routes (in line with the Holford and Horlock rules) from the 2TW 400kV overhead line; benefits from being sited away from settlements and individual residential properties and 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 the Substation. Although there are three ponds at the Overton Substation site the presence of Great Crested Newts is yet to be confirmed, and further survey work should be undertaken to confirm this. Mitigation measures will be put in place if there are any GCNs present in the ponds, including the provision of replacement terrestrial habitat to replace any lost.

Realignment of the 275kV Monk Fryston to Poppleton (XC/XCP) overhead line, east of Moor Monkton

2.5.20 Analysis of the pylons along this section of overhead line to the east of Moor Monkton identified that several pylons would need replacing due to the pylons being overloaded from the additional set of new conductors required to achieve the Project rating. Two options were identified. Both options involved moving the section of existing overhead line closest to Moor Monkton further to the south, with option 2 moving this section of overhead line further from the village than option 1. Option 2 would allow the pylon closest to Moor Monkton (existing pylon XC428T) to be removed completely.

2.5.21 Option 2 was selected, primarily as it allowed for the removal of existing pylon XC428T. This option would also have some benefit to views for some residents of Moor Monkton with pylons noticeably further from village and only a small increase in height, as the replacement pylons would need to comply with new standards.

Access to pylon XC472 near Newton Kyme

2.5.22 Alternative options for access to this pylon, which is located south of the River Wharfe, 1.4km north-west of Tadcaster, were considered as the existing access is in close proximity to Newton Kyme village which includes several listed buildings (including scheduled Kyme Castle, Grade II* listed Newton Kyme Hall and Grade I listed St Andrew's church) and historic environment receptors (Newton Kyme conservation area, medieval ridge and furrow). There was the potential for direct effects on the Grade II* listed Newton Kyme Hall as the proposed access route could result in direct effects on gates and other features which could form part of the curtilage of this listed building.

2.5.23 Four options were put forward; Option 1 was an amendment to the existing access route; Option 2 left the public highway to the south of Newton Kyme using an existing double width gate and Options 3 and 4 provided direct access from the A659 south of the pylon.

2.5.24 Option 1 was rejected due to effects on the historic environment receptors at Newton Kyme and a PRoW (Ebor Way long distance footpath route), the need to route construction traffic through Newton Kyme along a minor road, potential effects on flood defences, greater engineering cost (due to a longer section of route) and inability to accommodate construction traffic due to the width of the gate (also potentially part of Newton Kyme Hall) for the access point. Option 4 was rejected as it would not be possible for larger construction machinery to gain access to the pylon via this route and the route could impact flood defences. Options 2 and 3 were taken forward into the design but would need measures to minimise effects on crossing of watercourses and

to protect ground conditions (use of panels rather than stone access roads) to minimise historic environment effects.

Design evolution and next steps

2.5.25 Consultation on the information provided in this PEIR and the feedback received will be used to review and refine the design of the Project, where appropriate. This will then form the basis of the DCO application documents. The current Project design which is being consulted on is described in further detail in **Chapter 3: Description of the Project**.

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