This report has been prepared by Gillespies on behalf of National Grid. Detailed engineering and technical information was provided by National Grid. Stakeholder engagement inputs were provided by Camargue. We are also grateful to the Peak District National Park Authority, Barnsley Metropolitan Borough Council and the stakeholder reference group for providing background information.

Front Cover: 400kV Sealing End Compound at Dunford Bridge
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1 Introduction

Visual Impact Provision

1.1 Ofgem and National Grid have agreed a new set of price controls and incentives for the period from April 2013 to March 2021. This includes a provision of £500 million for electricity transmission owners to mitigate the visual impact of existing electricity infrastructure in nationally protected landscapes in Great Britain. For National Grid, which is the transmission owner in England and Wales, this means considering the effects of existing infrastructure on the visual amenity and landscapes of National Parks and Areas of Outstanding Natural Beauty (AONBs). National Grid have referred to this as the Visual Impact Provision (VIP).

1.2 In 2012-13 National Grid prepared a Visual Impact Provision policy setting out how the fund would be used and how stakeholders would be engaged in identifying opportunities for maximising benefits from it. After a public consultation on the draft between July and September 2013 the policy statement was presented to Ofgem for review. The policy statement made it clear that National Grid’s objective:

"is to achieve the maximum enhancement to the landscape from the available funds whilst ensuring that no significant adverse impacts arise as a result”.

1.3 The policy document included a set of guiding principles and a commitment to the creation of a Stakeholder Advisory Group consisting of stakeholders with national remits for England and Wales, and ways of engaging other stakeholders. National Grid is committed to using the VIP in a collaborative and transparent way.

1.4 In 2014 National Grid commissioned a landscape and visual impact assessment project to provide evidence, both to itself and its Stakeholder Advisory Group about the relative impacts of the different transmission lines and to inform the decision making process. The purpose of the landscape and visual impact assessment project was to identify those sections of electricity transmission lines within in England and Wales that have the most important impacts on the landscape and visual amenity of these designated landscapes. The emphasis was on undertaking a comparative assessment of the landscape and visual impacts of the sections of transmission lines that lie within the designated areas in order to identify a possible shortlist of candidate schemes for consideration by the Stakeholder Advisory Group and to decide which sections should be taken forward for more detailed technical assessment.

1.5 The landscape and visual impact assessment Technical Report was published in October 2014, and included a suggested shortlist of twelve subsections of overhead line which emerged as having the highest level of combined landscape and visual impacts, and therefore merited further investigation. The twelve subsections (listed in order of combined landscape and visual impact score and by alphabetical order where scores are the same) are presented in Table 1.1:

Table 1.1: Twelve Shortlisted Sections of Overhead Line

<table>
<thead>
<tr>
<th>Designated Area</th>
<th>Subsection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamar Valley AONB</td>
<td>YF.1</td>
</tr>
<tr>
<td>Peak District NP</td>
<td>4ZO.4</td>
</tr>
<tr>
<td>Dorset AONB</td>
<td>4YA.7</td>
</tr>
<tr>
<td>Peak District NP</td>
<td>4ZO.2</td>
</tr>
<tr>
<td>Peak District NP</td>
<td>4ZO.3</td>
</tr>
</tbody>
</table>
The Stakeholder Advisory Group accepted all 12 of these subsections as worthy of progression to the next stage of the work. The Tamar Valley AONB was used to pilot an approach to the appraisal of the different mitigation options that might be feasible. The approach was then rolled out to all of the shortlisted subsections of line. The aim of this work was to define one or at most two preferred options for mitigation in the form of ‘mitigation projects’ for each shortlisted subsection of line.

Since undergrounding is likely to emerge in many cases as a preferred approach, a prime consideration in defining the projects in each case was the potential location of sealing end compounds (SECs) where the transition from overhead to underground lines takes place. In identifying suitable locations it has often been the case that the most suitable place for the SECs will lie outside the extent of the line subsection on the shortlist. This means that the projects may include an adjacent part of a line subsection not assessed as having the highest level of landscape and visual impact but which must be included for practical purposes.

Conversely, in some cases not all of the shortlisted subsection is included within the study area. Reasons for this, where applicable, are highlighted in the individual reports but include; changes as a result of subsequent stakeholder discussions, and further appraisal from site visits (the divisions between subsections were originally determined based on changes in landscape character, as presented in published documents, prior to field surveys being carried out, rather than on the basis of scale of impact).

Following approval from the Stakeholder Advisory Group, National Grid, is also developing an initiative which will use part of the £500 million allocation for smaller localised visual improvement projects which can be accessed by all AONBs and National Parks with existing National Grid electricity infrastructure. This landscape enhancement initiative (LEI) has an ambition to provide up to £24 million over six years (2015 to March 2021) with the aim of reducing the visual impact of National Grid’s existing infrastructure and improve the related visual quality of the landscape.

### The Peak District National Park (East) Project

Following the acceptance of the findings of the Technical Report by the Stakeholder Advisory Group, National Grid decided to progress all of the other 11 sections to the same stage. The identified section of line runs from a SEC near to the eastern entrance of the Woodhead Tunnel at Dunford Bridge eastwards along the Upper Don River before it crosses the National Park boundary. This section of line is 2.37km in length, and is shown in the context of the National Park in **Figure 1.1**.
Figure 1.1: Subsection 4Z0.2 within Peak District National Park
Peak District National Park

1.11 In 1951 the Peak District was the first area in England and Wales to be designated as a National Park. The aims and purposes of National Parks are laid out by law as follows:

"The 1949 National Parks and Access to the Countryside Act, was a law made by parliament that set out what our National Parks would be like. The Environment Act 1995 revised the original legislation and set out two statutory purposes for National Parks in England and Wales:

1 Conserve and enhance the natural beauty, wildlife and cultural heritage
2 Promote opportunities for the understanding and enjoyment of the special qualities of National Parks by the Public

When National Parks carry out these purposes they also have the duty to:

- Seek to foster the economic and social well being of local communities within the National Parks

1.12 Special Qualities of the National Park are defined in the Peak District National Park Management Plan as follows:

- Natural beauty, natural heritage, landscape character and landscapes.
- Sense of wildness and remoteness.
- Clean air, earth and water.
- Importance of wildlife and the area’s unique biodiversity.
- Thousands of years of human influence which can be traced through the landscape.
- Distinctive character of hamlets, villages and towns.
- Trees, woodlands, hedgerows, stone walls, field barns and other landscape features.
- Significant geological features.
- Wealth of historic buildings, parks and gardens.
- Opportunities to experience tranquillity and quiet enjoyment.
- Easy access for visitors and surrounding urban areas.
- Opportunities to experience dark night skies.
- Vibrancy and a sense of community.
- Cultural heritage of history, archaeology, customs, traditions, legends, arts, and literary associations.
- Opportunities for outdoor recreation and adventure.
- Environmentally friendly methods of farming and working the land.
- Craft and cottage industries.
- Opportunities to improve physical and emotional well-being.
- Special values attached to the national park by surrounding urban communities.
- The flow of landscape character across and beyond the national park boundary.  

1 http://www.nationalparks.gov.uk/learningabout/whatisanationalpark/aimsandpurposesofnationalparks
1.13 The focus of the VIP project is on the mitigation of landscape and visual impacts, and the assessment of these impacts is set out in the landscape and visual impact assessment Technical Report\(^3\). The summary sections relating to the 4ZO.2 subsection are reproduced below.

4ZO.2 is judged to have **landscape impacts of a high level of importance** on the *Dark Peak moorland slopes & cloughs* and *Dark Peak Yorkshire Fringe slopes & valleys with woodland*, landscape character areas. This landscape is transitional in character with some of the special qualities of the National Park being displayed. Strong localised topographical variety around Dunford Bridge, together with the proximity of nearby areas of high conservation interest, recreational value and relative tranquillity, all serve to increase the value of the landscape. Although the impact of the line is geographically contained, the scale of impact is high with the terminal pylon and sealing end compound being locally dominant man-made features.

This subsection is also judged to have **visual impacts of a high level of importance**. Dunford Bridge serves as a local gateway for visitors to the Pennine Moors. The pylons are skylined in views from visitors to the promoted Trans Pennine Trail car park, picnic area and walkers and cyclists on the Trans Pennine Trail National Cycle Route 62. The scale of visual impacts on the local community in and around Dunford Bridge is also considered to be high due to the proximity of the line and its elevated situation in relation to this settlement.

1.14 Engagement events (‘Stakeholder Reference Group’ workshop and public ‘drop in’) were undertaken in April 2015 (see **Section 4**). The western part of section 4ZO.2 was identified as having the greatest visual impacts whilst the line to the east along the Upper Don Valley had fewer impacts on visual amenity in terms of receptor groups and numbers; with views from the Trans Pennine Trail often being screened by vegetation.

1.15 A number of potential solutions may help mitigate the landscape and visual impact of the 400kV overhead (transmission) line (400kV OHL) on the National Park. The purpose of this Options Appraisal Study is to identify these and determine which, if any, will deliver the necessary mitigation without giving rise to adverse impacts that would be greater than those being mitigated.

Figure 1.2 View of sealing end compound at Dunford Bridge
2 Methodology

2.1 This study identifies potentially feasible ways of mitigating the identified impacts of the 4ZO.2 route on the Peak District National Park. The appraisal of the identified options follows the general approach set out in National Grid’s document *Our Approach to Options Appraisal* (2012). It covers the three main topic areas (Technical, Environmental and Socio-Economic) which can be broken down into sub-topics as identified in Table 2.1 below. Sub-topics are only considered where they may influence the choice of option.

**Table 2.1: Appraisal Topics**

<table>
<thead>
<tr>
<th>Technical</th>
<th>Environmental</th>
<th>Socio-economic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical complexity</td>
<td>Landscape and visual</td>
<td>Local economic impact</td>
</tr>
<tr>
<td>Construction/project delivery</td>
<td>Ecology</td>
<td>Aviation and defence</td>
</tr>
<tr>
<td>issues</td>
<td>Historic environment</td>
<td>Traffic and transport</td>
</tr>
<tr>
<td>Suitability of technology</td>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Network capacity</td>
<td>Local air quality</td>
<td></td>
</tr>
<tr>
<td>Network efficiencies/ benefits</td>
<td>Noise and vibration</td>
<td></td>
</tr>
<tr>
<td>Soils and geology</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 The methodology for this study comprises the following key stages:

- Establish a study area and gather baseline information, including information assembled for the landscape and visual impact assessment (see Section 3);
- Undertake local stakeholder engagement to gather information, organised by National Grid in association with the National Park authority (see Section 4);
- Identify options which would mitigate the identified impacts without giving rise to other significant adverse impacts (see Section 5); and
- Undertake an appraisal of these options and report on their potential impacts, and make a recommendation to the Stakeholder Advisory Group on the favourable option (see Section 6).

2.3 In addition, the table in Appendix 1 provides a preliminary overview of the likely primary consents associated with each option. It should be noted that that this is an initial view based on the draft options and has not been the subject of discussions with stakeholders. The purpose at this stage is to assist in understanding the complexity of the options, in consenting terms and to provide an indication of the associated timescale for achieving consent. Any option chosen would also need agreement from the landowner. If an option is selected to be taken forward to the next stage of development a detailed Consents and Land Strategy will be produced.

**Environmental Statement**

2.4 If this area is selected to be taken forward to the next stage whereby a detailed scheme will be developed, regardless of whether the proposal requires an Environmental Impact Assessment...
under the terms of the *Town and Country Planning (Environmental Impact Assessment) Regulations*, National Grid would undertake an Environmental Impact Assessment and produce a detailed Environmental Statement to accompany the planning application.
Study Area and Baseline

Route History

3.1 The 4ZO 400kV overhead line connects Stalybridge 400kV substation, Stocksbridge 400kV and Thorpe Marsh 400kV substations. The line was constructed between 1966 and 1967 with L6 standard lattice pylon design and strung with twin and quad conductor bundles along various sections. There is a high voltage cable section installed in the Woodhead Tunnel between Dunford Bridge and Woodhead connecting the eastern and western section of the overhead line.

3.2 The substations at Stalybridge serve as a connection point for the local distribution network for the Manchester area. Any potential solution would be designed to meet the potential capability of the existing infrastructure.

Study Area

3.3 The study area has been defined based on the extent of subsection 4ZO.2, which was assessed as having some of the greatest impacts on landscape and visual amenity. 4ZO.2 is shown in Figure 1.1, and runs from Dunford Bridge in the west and then beyond the National Park boundary along the Upper Don Valley to Castle Hill. The most notable landscape and visual impacts of subsection 4ZO.2 are associated with the western part of the line, in particular the SEC at Dunford Bridge and first few pylons which are in elevated locations above and around the settlement, these are highly visible on the local skyline and conflict with landform. The impacts of the eastern half of this subsection are much less significant due to reduced visibility from the Park resulting from the location of the line along the lower slopes of the Upper Don Valley. 4ZO.1 takes the line back into the National Park for a short section to the east; this subsection was found to have lesser impacts on the National Park.

3.4 The outer limits of the study area have been defined as:

- Winscar Reservoir to the west;
- Tinker Hill to the north;
- The A616 in the east; and
- Thurlston Moors to the south.

3.5 The resulting study area is shown in Figure 3.1. The rest of this section outlines features and potential constraints of the study area and its immediate surroundings which are likely to influence a decision on which mitigation solution to pursue for Peak District National Park, with reference to the environmental topics listed in Table 2.1.
Figure 3.1: Study Area
Environmental Baseline

Landscape and Visual

3.6 Landscape and visual impacts are defined in the third edition of *Guidelines for Landscape and Visual Impact Assessment* (GLVIA3), as follows:

- Landscape impacts means effects on the landscape as a resource in its own right; and
- Visual impacts means effects on specific views and on the general visual amenity experienced by people.\(^4\)

3.7 The 400kV OHL runs from a SEC near to the eastern entrance of the Woodhead Tunnel at Dunford Bridge. The line runs eastwards around Dunford Bridge before leaving the National Park boundary. The SEC, terminal pylon subsequent three angle pylons to the east are particularly prominent on the local skyline and lie close to residential properties in Dunford Bridge.

Landscape Character

3.8 This section presents an overview of the landscape baseline including landscape character, current landscape condition and any designation attached to the landscape.

3.9 Dunford Bridge SEC is located immediately south west of the small hamlet of Dunford Bridge at the eastern end of the Woodhead Tunnel. The landscape here is characterised by reservoirs, moorland and pastoral river valleys. The line diverts slightly to the south from the SEC (around the small settlement of Dunford Bridge) and exits the National Park before continuing along the boundary of the Park following the lower slopes of the Upper Don Valley to the east.

3.10 The line passes through areas characterised in the Peak District National Park Landscape Strategy and Action Plan 2009 – 2019 as landscape character types (LCT). Within the Park the line runs along the boundary of *Dark Peak Moorland Slopes & Cloughs and Dark Peak Yorkshire Fringe Slopes & Valleys with Woodland* LCTs. Outside the Park the line lies fully within *Dark Peak Yorkshire Fringe Slopes & Valleys with Woodland* LCT. LCTs are illustrated on *Figure 3.2*.

3.11 The landscape of the study area consists of a relatively small-scale river valley with steeply sloping and undulating valley sides punctuated by incised streams and flushes. To the north and south, steeper slopes and cloughs rise to open moorland on the high plateaux above. Land cover within the valley is generally small-scale pastoral fields enclosed by dry stone walls with intermittent trees. Deciduous tree cover is most notably associated with the Upper Don Valley and a disused railway line (now the route of the Trans Pennine Trail and National Cycle Route 62). Medium sized blocks of coniferous plantation lie to the east near to Winscar Reservoir. There are also small isolated settlements (primarily Dunford Bridge), as well as dispersed farmsteads and properties. The enclosed and intimate nature of the valley creates a sense of tranquillity. This tranquillity is interrupted by the presence of pylons.

Visual Amenity

3.12 This section identifies the visual amenity and availability of views as currently experienced by people (visual receptors). Visual receptors include local communities, residents in scattered houses, visitors to the area, recreational users including users of the Public Rights of Way network, motorists on the local road network and people working within the area.

3.13 General visibility within the valley is restricted to views along the valley corridor (west - east) and across the valley (north - south). Views are attractive where the character is more open and especially from elevated vantage points. Views are often foreshortened and visibility is further restricted by undulating landform and trees and blocks of woodland within and around the valley.

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Figure 3.2: Landscape Character

Peak District LCAs
- DP3 - Dark Peak Moorland slopes & cloughs
- DP4 - Dark Peak Open moors
- YF2 - Dark Peak Yorkshire Fringe Enclosed gritstone upland
- YF3 - Dark Peak Yorkshire Fringe Slopes & valleys with woodland

Source: Natural England, National Grid, LCA - Peak District NP

3.14 People within the National Park who experience these views include residents of Dunford Bridge as well as people living in the scattered farmsteads and properties within the area, many of which are outside the Park. The presence of pylons also affects the experience of visitors who park at Dunford Bridge and come to walk and enjoy the scenery or participate in watersports at Winscar Reservoir. People using the local lanes and users of the Trans Pennine Trail (part of European Long Distance Footpath E8), National Cycle Route 62, National Cycle Route 68, Kinder Loop long distance bridleway, Barnsley Boundary Walk and the Upper Don Valley Trail often have clear foreground views of pylons.

**Ecology**

3.15 This section of 400kV OHL does not cross any international or national designations.

3.16 The moorland to the far west of the study area is designated at an international level as South Pennine Moors Special Area of Conservation (SAC) and Peak District Moors (South Pennine Moors Phase 1) Special Protection Area (SPA). At a national level it is designated as the Dark Peak Site of Special Scientific Interest (SSSI). These designations are shown on Figure 3.3.

3.17 South Pennine Moors SAC has been designated for its extensive areas of European dry heaths, blanket bogs and old sessile oak woods with holly (Ilex) and fern (Blechnum) species in the British Isles and also northern Atlantic wet heaths with Erica tetralix and transition mires and quaking bogs. These are all Annex I habitats which are protected under Council Directive 92/43/EEC Habitats Directive, with the aim to maintain or restore natural habitats and wild species listed on the Annexes to the Directive.

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5 South Pennine Moors SAC, JNCC. http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=UK0030280
3.18 Peak District Moors (South Pennine Moors Phase 1) SPA is designated because of its bird populations of European importance which include merlin (*Falco columbaris*), golden plover (*Pluvialis apricaria*) and short-eared owl (*Asio flammeus*).\(^6\)

3.19 The Dark Peak SSSI is protected because it is an extensive tract of semi-natural upland vegetation typical of and including the full range of moorland vegetation of the South Pennines. Several vegetation types, plants and animals are at either the southern or northern limits of their distribution in this country. The Dark Peak moorlands support the full range of breeding birds found in the South Pennines, some of which are represented at their southern most viable English locations and which are of great regional and national importance. Many physical features of the Dark Peak are of geological interest\(^7\)

3.20 The Upper Don Valley around Dunford Bridge is not recognised as being internationally or nationally important in ecological terms but is of local importance for wildlife and habitats. Wogden Foot is a Local Wildlife Site, is on the site of former railway sidings where limestone ballast was dumped after closure of the Woodhead Line. It displays an unusual mix of acidic, neutral and calcareous grassland habitats\(^8\) including lowland heath which is a UK BAP priority habitat\(^9\). Over 86 plant species have been identified including the rare Jacob’s ladder, which is normally found in limestone dales, other notable species include wild mignonette and common spotted orchid. To maintain species-richness, the site is managed by conservation grazing using native breed sheep and cattle.

3.21 The undesignated parts of the study area comprise areas of moorland and pastoral farmland, with dry stone walls and small areas of woodland along watercourses. Searches for protected species data and ecological surveys will be undertaken to inform detailed routeing.

**Historic Environment**

3.22 There are no internationally or nationally designated features in the study area. There are however several Grade II listed buildings along Brook Hill Lane to the north of the line (Brook Hill Lane runs from Dunford Bridge to Carlecotes and beyond) and a Grade II listed barn at Softly Farm to the north east. These listed buildings are shown on Figure 3.4. There is a high possibility that unrecorded industrial archaeology exists under the old railway line and that unrecorded prehistoric archaeology exists under historical field systems to the north of the Upper Don River.

3.23 The Historic Environment Record (HER) may identify further historic features. This work is ongoing and will be included in the final information submitted to the Stakeholder Advisory Group.

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\(^6\) Peak District Moors (South Pennine Moors Phase 1) SPZ Citation
http://publications.naturalengland.org.uk/publication/614589668169728
\(^7\) http://www.sssi.naturalengland.org.uk/citation/citation_photo/1003028.pdf
\(^8\) http://www.barnsleybiodiversity.org.uk/sites.html
\(^9\) http://www.barnsleybiodiversity.org.uk/lowlandheath.html
Water

3.24 The Environment Agency’s Flood Map shows several narrow zones along the Upper Don River which have a ‘High’ risk of flooding; areas with a ‘Medium’ risk of flooding to the east of Windle Edge road adjacent to Don View road in Dunford Bridge and immediately north of the river near Upper Townhead Farm. Elsewhere along the river the risk of flooding is indicated as ‘Low’.\(^{10}\)

3.25 Several minor watercourses feed into the Upper Don River. Railway culverts still exist under the Trans Pennine Trail including a culvert for the watercourse which flows to the Upper Don River from Lower Windleden Reservoir.

3.26 More detailed assessment of water quality and potential impacts is likely to be required for construction and operational activities as part of the supporting documentation to accompany a planning application(s).

Soils and Geology

3.27 The bedrock underlying most of the area comprises Millstone Grit of the Rossendale Formation (Mudstone and Siltstone), Marsden formation (Mudstone and Siltstone) and Huddersfield White Rock (Sandstone). There are superficial deposits of alluvium (clay, silty) on the south side of the Upper Don Valley and superficial deposits of peat on the moorland.

3.28 At Wogden Foot there is limestone railway ballast that was dumped on the site after the closure of the railway line.

Other Environmental Issues

3.29 At this stage of the appraisal process it is considered that certain environmental topics, for example local air quality, noise and vibration would not influence the choice of a preferred option and hence have not been included. More detailed assessment of a wide range of topics (including air quality, noise and vibration) is likely to be required for construction and operational activities as part of the supporting documentation to accompany a planning application(s).

Socio-Economic Baseline

Local Economic Activity

3.30 Socio-economic activity is mainly restricted to farming activities with the land being used for sheep and cattle grazing. Farmland around subsection 4ZO.2 is classified as low grade 4 or 5\(^{11}\).

3.31 The Pennine Sailing Club is based at Winscar Reservoir and has a growing membership of some 200 sailors and windsurfers from the surrounding areas of Sheffield, Huddersfield, Barnsley and Glossop.

3.32 Up until early 2000 there was one public house in Dunford Bridge, this has now closed down and is to be converted into two dwellings.

Traffic and Transport

3.33 The road network immediately around Dunford Bridge is limited to lanes/ unclassified roads which link the scattered settlements and individual farmsteads and properties; however, the A628 and A616 main roads provide adequate road links to the west and east.

Access and Recreation

3.34 The Trans Pennine Trail and National Cycle Route 62 largely follow the route of the old railway line and the Upper Don Valley Trail from west to east. The Trans Pennine Trail also forms part of European Long Distance Footpath E8.

\(^{10}\) http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=floodmap&scale=9&ep=map&layerGroups=default&lang=_e&y=63336&x=242219#x=415501&y=402537&scale=11

\(^{11}\) http://publications.naturalengland.org.uk/publication/6172638548328448
3.35 National Cycle Route 68 (Pennine Cycleway) runs from north to south skirting around Winscar Reservoir and along the same route as the Barnsley Boundary Walk.

3.36 There are relatively few Public Rights of Way in the area; however, there are vast tracts of Open Access Land up on the moorlands.

3.37 There is a car park and picnic area next to the road bridge at Dunford Bridge and further car parking and picnic areas to the east of Winscar Reservoir off Dunford Road and also to the south west of the reservoir off Windle Edge.

3.38 As noted previously Winscar Reservoir is well used for recreational boating By Pennine Sailing club

3.39 Access and recreation features are shown on Figure 3.5.
4 **Stakeholder Engagement**

**Introduction**

4.1 Having identified a shortlist of 12 subsections of line in eight designated areas using the landscape assessment methodology, the Stakeholder Advisory Group asked National Grid to carry out early stage engagement with stakeholders and the public at a local level.

4.2 The aim of this early engagement was to gather information and intelligence on the areas to inform the options assessments and to gauge local attitudes and opinions on the work. It was also felt that involving local groups and individuals at the outset would not only help to identify any potential problems and challenges but also to give the local community a sense of ownership. It should be a requirement of any scheme taken forward to major engineering work that it has the support and involvement of local people.

4.3 It was also agreed at the Stakeholder Advisory Group that National Grid should work with the Peak District National Park Authority to present a collaborative, inclusive partnership approach to the local community.

**Stakeholder Meeting**

4.4 Following an independently facilitated workshop involving a broad range of stakeholders to discuss the options for the shortlisted section of line to the west of the Woodhead Tunnel (held in March 2015), it was agreed that it would be necessary to adopt a similar approach to stakeholder engagement for the shortlisted section to the east of the Woodhead Tunnel as had been adopted in the other locations. It was agreed therefore that:

- Stakeholder engagement would take place as soon as practically possible.
- The engagement event would take place on the same day with a workshop for selected, relevant individuals / organisations followed by a drop in event for the public (afternoon and evening).
- This initial stakeholder engagement would inform the landscape and technical work.
- The workshop would be a closed session, focused on a smaller group and technical in nature. Attendees would comprise primarily key representatives from the National Park Authority (NPA) and other key statutory bodies identified by the NPA and agreed with National Grid.
- Personal invites would be issued to the workshop. Personal invites would also be issued to the drop in sessions to selected groups / individuals (as advised by the NPA).
- General invites would be sent to other relevant groups / local affected communities primarily using the NPA’s’ networks / databases. National Grid would work with the NPA’s communications officers to ensure that the message was delivered to relevant audiences.
- Drop in events would need to take place at a convenient location for members of the community as advised by local stakeholders.
Engagement Events

4.5 On the advice of local stakeholders, the events were held as follows. Both workshop and drop in event took place on Thursday 30th April 2015. The workshop was held at The Core building in Barnsley. The drop in event was held at The Parish Community Centre in Holmfirth, a venue close to the community of Dunford Bridge.

4.6 The workshop ran from 10.00am until 12.30pm and was attended by nine representatives from local stakeholders including Peak District NPA officers and representatives from Barnsley Metropolitan Borough Council, Dunford Bridge Parish Council, Natural England and the Trans Pennine Trail. Representatives from National Grid, Gillespies and Camargue were also in attendance.

4.7 The drop in event ran from 2.00pm until 8.00pm and were staffed by representatives from National Grid (VIP project team) along with Camargue. They were attended by a broad cross section of the local community with a number of local residents from Dunford Bridge represented. In total, 19 people attended the event.

4.8 The events were publicised as agreed with the NPA with direct invitations sent to the NPA’s mailing list of key stakeholders. The event was also promoted via the NPA’s website, a piece on its Facebook page and regular Tweets by its communications officer. National Grid worked closely with the NPA’s communications officer and provided material for use in publicity proactively and on demand.

4.9 A press release was produced and issued to local print and broadcast media. BBC Radio Leeds interviewed National Grid’s press officer Jeanette Unsworth who explained the VIP process to the listeners and promoted the drop in event in Holmfirth.

Stakeholder feedback

First Technical Workshop

4.10 The section of overhead line (east of Woodhead Tunnel) that scored as one of the highest in the 2014 appraisal was sub-section 4ZO.2 (2.37km long) which runs in an east – west direction towards the north of the National Park.

The following key issues were discussed at the Technical Workshop:

4.11 Overview of the Area

- There was general agreement among all stakeholders present that the SEC in Dunford Bridge is visually intrusive and had a negative impact on the local community (particularly residents of Dunford Bridge) and on the Trans Pennine Trail.

- A number of stakeholders were keen to point out the potential for local regeneration that the removal of the SEC and section of transmission line could have on the local community. Dunford Bridge had recently seen its village pub close and the area in general was under-utilised when compared to other nearby areas of the Peak Park.

- It was pointed out that much hard work and effort had been put into landscaping the Trans Pennine Trail by enthusiastic local volunteers.

4.12 Landscape and Visual

- The SEC at Dunford Bridge is visually intrusive. When the SEC was originally proposed (pre-VIP project), Dunford Bridge Parish Council requested that this line section was placed underground (thereby removing the need for a SEC in Dunford Bridge) but it was deemed uneconomical.

- Stakeholders would like to see the line removed as far as Hazlehead but it was recognised that the section of line that runs to Hazlehead was not on the shortlist and its consideration could not be justified. A more likely end location for any mitigation work would be at Castle Hill. Stakeholders would be happy with this.
• Although it was felt that there was no easy location for the SEC, it was felt that Castle Hill might be a suitable location.

• An alternative would be in the valley below Wogden Foot where trees would potentially be able to screen the SEC. It would also be hidden from Carlecoats and there would be less distance from the road in from the Trans Pennine Trail than Castle Hill – making maintenance / access easier.

• The group felt that placing the cables underground or in cable troughs would provide the best solution to mitigate the impact of the existing line. The best location for doing this was the subject of much debate. Options for burying the cable under the Trans Pennine Trail (in a mixture of cable troughs and direct bury) or in agricultural land to the north of the line (direct bury) were considered to be the best options worthy of further investigation.

• Concerns were also raised about the visual impact of any access road to the SEC and it was agreed that this would need careful consideration.

4.13 Ecology / Environment

• Wogden Foot is a local wildlife site managed by the South Yorkshire Wildlife Trust. It is unusual because ballast that was dumped there has acted as limestone and created an enclave with unique limestone flora within an area of largely gritstone.

• Wogden Foot boasts a number of rare plants, wildflower meadows and orchids as well as two types of bat colonies and two badger setts.

• There is also believed to be a glow worm colony at Wogden Foot (only the second in south Yorkshire). A survey will be undertaken into this during the summer.

• Conservation volunteers have worked hard to establish wildflower meadows and other features along this stretch of the Trans Pennine Trail.

• Hazlehead is an important area for breeding waders.

• Actions to prevent the ballast being washed on the Upper Don River near Wogden Foot has effectively protected this stretch of the river – which is the only grade one water supply in south Yorkshire. It may be possible to attract salmon to this stretch of the river and local environmentalists are looking at this option currently.

• Some stakeholders wondered whether it would be possible to improve the wetland environment in the area as a result of the work.

• Stakeholders were keen to understand what constitutes deep-rooted plants and requested guidance from National Grid. Is heather considered deep root for example?

4.14 Archaeology

• Stakeholders representing archaeological interests set out what they would like to see from National Grid in the event of intrusive works taking place either along the Trans Pennine Trail or in its vicinity. This would include desk-based research with walk overs and an evaluation of the particular areas of interest.

• It was stated that although the Trans Pennine Trail offers much from a cultural heritage perspective there is likely to be little of interest in terms of archaeology.

• There is however a high potential for archaeology in the agricultural land to the north of the line particularly in relation to field systems, etc.
• It was requested that National Grid open up a dialogue with archaeologists from both the South Yorkshire Archaeology Service and the Peak District National Park Authority.

• If the option of burying in the agricultural land was taken, a fund would be required for investigating the archaeology – especially the old field patterns – and for restoring them once construction work was complete.

4.15 Land Ownership

• The land for the Trans Pennine Trail (and a 30m/40m corridor around it) is owned by Barnsley Metropolitan Borough Council. Beyond that the land (both agricultural – to the north) and moorland – to the south) is in private ownership.

• It was agreed that there were probably around three landowners of the agricultural land to the north and west.

4.16 Tourism

• Stakeholders were in unanimous agreement that the removal of the shortlisted line could have a major impact on the regeneration of the area and in generating tourism in the Dunford Bridge area.

• Currently the village is blighted by the SEC. It is also the gateway to the National Park and more could be made of this if the line and SEC were removed.

• Although the pub has closed, it was felt that more could be made of Dunford Bridge’s gateway to the National Park status and that there would be scope for cycle hire and / or a cafe.

• Currently the Dunford Bridge car park is severely under-used. On busy days, the car parks at Langsett and Crowden are full to overflowing whereas there are few cars at Dunford Bridge. This could change and the removal of the line would be the catalyst for this change.

• Nearby sailing at Winscar also has the potential to bring economic growth into the area.

• Dunford Bridge is also crossed by a number of key cycle routes including the West Yorkshire Cycle route which is designed to get people from Sheffield out into the National Park.

• The local authority and parish council were extremely positive about the potential positive impacts on tourism and the local economy of removing the SEC and shortlisted line. They reported that there was also significant local support for this.

4.17 Public Rights of Way and Access

• Clearly if the Trans Pennine Trail was used as the location to bury the line in cable troughs, there would be significant disruption to the route and an alternative would need to be found.

• The interests of all user groups – walkers, cyclists and horse riders – will need to be taken into consideration.

• Rights of Way officers from Barnsley MBC identified an alternative route (marked on an OS map) and this was given to the National Grid project team. Although not much longer in distance, the route runs to the south of the existing trail and work would be needed to make good the path particularly in some very wet areas. The temporary diversion would also involve potentially three crossings of the A628 which would have safety issues particularly for horse riders.

• The footpath at Town Head Road needs upgrading. It is currently too difficult for horses.
• There have been complaints from horse riders that there is insufficient grass on the Trans Pennine Trail. However, some stakeholders felt that horses were damaging the trail and that proper provision needs to be made on the Trail for horse riders.

4.18 Potential Solutions / Construction Issues

• Cutting a 9m swathe through sections of the Trans Pennine Trail might prove difficult due to the narrowness of the trail and the steep nature of the valley on either side.

• The SEC would require permanent access for maintenance while the access for any horizontal directional drilling under the Upper Don River (if required) would only need to be temporary.

• Vehicle access may be challenging – both in construction and maintenance of the SEC – as the valley sides are steep when off the Trans Pennine Trail. An access road to the Trail was built to enable resurfacing for the Tour de France in 2014. This may be an option but it was not designed for heavy construction traffic.

• Culverts would need to be checked and potentially replaced.

• Underground cable is low maintenance and people are unlikely to drill into them. Stakeholders felt it would be even less likely if the cables were in troughs under the Trans Pennine Trail.

• Cable troughs are air cooled and only a limited amount of material can be placed on top. There is a possibility of growing grass on top of a cable trough but it is limited.

• Stakeholders asked National Grid to investigate alternative coverings / materials for the cable troughs. National Grid confirmed that it would not be possible to stack the cables in the troughs as this would create hot spots.

• Troughs are very near the surface to enable the cable to be air cooled (and therefore closer together than in a direct bury situation).

• If cable trenching along the Trans Pennine Trail, it would not be possible to bring HGVs along the top road. They would need to come along the valley from Town Head.

• Given the comparative ease of restoring agricultural land after direct burial, stakeholders were keen that National Grid investigate the possibility of burying the cable in agricultural land to the north of the Trail as well as in cable troughs under the Trans Pennine Trail.

Feedback from the Drop-in Event

4.19 Eight feedback forms were completed at the Peak District East event. Comments are summarised below:

• The local residents were interested in the VIP project and spent time discussing the project with the members of the VIP Team.

• Feedback received was predominantly from people living around the SEC at Dunford Bridge and they were generally supportive of the project.

• Over half of the comments on the forms were positive about the removal of overhead line to help visually improve the landscape. It was felt that the disruption to remove the pylons would be a short term inconvenience as it would ensure the area benefitted in the longer term.

• Tourism was an important issue for two residents and they voiced their support for the removal of the pylons, stating that it would encourage more people to visit the area.
particularly to walk and cycle. Dunford Bridge does not attract the same level of tourism compared to other higher profile areas within the National Park.

- Referring to the SEC in Dunford Bridge as an “eyesore”, one resident was supportive of undergrounding the cables, especially over other options such as lower height pylons.

- One local landowner gave his support towards the project but shared his experience of working with National Grid on another project in the area. At the event, the project team talked to him and heard about his concerns.

- Another resident was keen to learn more about the proposals as he had reservations about the impact of the major engineering works on his daily life.

4.20 According to one resident, the pylons make a constant humming sound and their removal would be welcomed to restore peace and tranquillity to the area.

**Second Technical Workshop**

4.21 A second meeting of technical stakeholders took place at The Core in Barnsley on 12 August 2015. Prior to the meeting each attendee was sent a copy of the Options Appraisal report. The aim of the session was to obtain their feedback on the report and to provide attendees with a forum in which they could raise any issues before the report is formally presented to the project’s Stakeholder Advisory Group in September 2015.

Attendees were asked by National Grid to highlight any issues or inaccuracies in the report.

The meeting discussed the options for the section of line, 4ZO.2 and the following key points:

4.22 Transport during construction and access to the SEC during operations was a major consideration for the SRG.

Careful consideration will need to be given for the location of access roads both during construction and operation. The sides of the valley are steep sided.

If access is along the Trans Pennine Trail (TPT) then a large section of the trail will need to be closed during construction and alternative routes identified and agreed. Approval from Highways England for crossings on the A616 and associated signage will need to be factored into the programme and secured well in advance of the temporary diversion of the TPT.

4.23 The SRG requested that search area B is extended to the west to include Castle Hill. The SRG felt that the SEC could be accommodated better in search area B provided Castle Hill was included. This was balanced however by the narrow width of the TPT in this section and the likely need to take land from Wogden Foot nature reserve.

4.24 The SRG commented that the report needs to state that Wogden Foot nature reserve would be affected if option B is selected due to the narrow width of the TPT at this point.

4.25 The SRG requested that a section on public rights of way which states that an alternative for the TPT suitable for all users must be provided before any construction work begins is included in section 6.

4.26 The SRG welcomed the report and considered both options. Although it asked for the area of search for option B to be extended to the west to include Castle Hill, the overall consensus was the option A was preferred.

It was felt that this option removed the section of line where it had the greatest impact (including the SEC at Dunford Bridge). It also had no impact on Wogden Foot nature reserve and means that less of the TPT would need to be re-directed during construction.
5 Potential Mitigation Solutions

Introduction

5.1 A number of alternative solutions exist which could mitigate the impact of the 400kV OHL on the National Park. The following section discusses each of these in turn. All routes shown are entirely indicative, and will be subject to detailed route design if shown to be feasible. Construction and operational impacts have been included in the consideration of these potential solutions. Decommissioning of the existing 400kV OHL has not been factored in at this appraisal stage as it is unlikely to influence between the mitigation options. However, the following paragraph outlines the envisaged decommissioning process of the redundant infrastructure once the new connection is operational.

5.2 Decommissioning would involve many of the activities associated with the construction phase, for example provision of access points and haul roads and associated traffic movements for the removal of equipment. Upon removal much of the material would be taken for reuse or recycling. Pylon fittings, such as dampers and spacers, would be removed from the conductors. The conductors would be cut into manageable lengths or would be winched onto drums. Each pylon may be dismantled by crane, with sections cut and lowered to the ground for further dismantling and removal from site. If space is particularly restricted, the pylon can act as the scaffold and be dismantled from the inside. Conversely, in large areas it may be possible to cut the pylon at the base and then pull the pylon to the ground using a tractor and then cut into sections. A decision as to whether pylon foundations would be left in the ground would be made at such time in the future and would also take account of land owner wishes and environmental issues.

5.3 For the mitigation options identified it may be necessary for the erection of temporary structures whilst cable sealing end and / or overhead line works are undertaken. These temporary structures would require new designated access routes, however, these access routes and structures would be removed once the new connection becomes operational.

Option 1: Alternative Pylon Design

5.4 Under Option 1, the route of the current overhead line would be maintained, as shown in Figure 1.1, but alternative pylon designs would be deployed from the SEC to the area around Castle Hill. This could include either of the following designs, which are illustrated in Figure 5.1, together with a conventional lattice pylon, which is included for comparison purposes:

- The new T-pylon design; or
- Low height pylon design (L12/LH).
5.5 The T-pylon design was introduced by National Grid following a competition, as it was considered to be an attractive, innovative and simple design while still offering the required structural performance. It is around 10m shorter than the typical lattice pylon. Operational T-pylons have not yet been deployed in the UK, though prototypes have been erected. An artist’s impression of a T-Pylon is shown in Figure 5.2.

5.6 Low-height pylons are variations on the lattice pylon design, which carry the conductors in a different arrangement. They are around 10m shorter than the typical lattice pylon, though significantly wider with more substantial cross-arms. An example is shown in Figure 5.3.

5.7 In order to maintain the current route alignment, the existing line would have to be temporarily diverted during construction work. This temporary diversion would require the construction of a new overhead line route which would in turn require consent.

5.8 Discussion of this option with the project team, together with the feedback from the stakeholder engagement, indicates that this option would not sufficiently mitigate the landscape and visual impacts of the line in, and adjacent to, the National Park. Although lower, these alternative structures would still be highly visible in the landscape and would not negate the need for a SEC; indeed it is the SEC which has some of the greatest impacts on visual receptors. The development of alternative pylon designs was therefore considered not to offer sufficient mitigation of the landscape and visual effects, particularly in relation to Dunford Bridge; hence this option was not investigated further.
Option 2: Overhead Line on Alternative Route Alignment

5.9 Option 2 would involve re-routeing the 400kV OHL along an alternative alignment (either using conventional lattice or alternative pylon design).

5.10 The greatest impact of 4ZO.2 is associated with the SEC and the first few pylons around Dunford Bridge. An alternative route alignment would not remove the need for the SEC and would also have to negotiate around Dunford Bridge. The likely landscape and visual effects on Dunford Bridge would therefore remain significant due to the proximity of SEC and pylons (whether they be standard or alternative design). Additionally, as the existing route is relatively straight, any re-
routeing of the line would necessarily involve a net increase in the number of pylons, so is therefore likely to have increased visual impact. Hence this option was not investigated further.

**Option 3: Underground Cable – Direct Burial/ Cable Troughs**

5.11 An underground cable connection would replace all or part of the 4ZO.2 subsection of overhead line which would be removed following installation and commissioning of the cable.

5.12 Direct burial of an underground cable would require a construction corridor typically 30-50m wide along the length of the cable route. This width is to accommodate the cable trenches, haul road, storage areas for stripped topsoil and sub soil from the cable trench excavation and inclusion of any temporary & permanent land drainage requirements. This is based on the assumption that direct burial is using twelve cables to maintain circuit capacity. Following completion of the cable installation, the ground would be returned to its previous use. Hedgerows and other field boundaries would be reinstated. Trees felled would not be replanted over the buried cable but would be replaced elsewhere. Figure 5.4 shows a typical cross section for underground cable construction.

5.13 An alternative to direct burial is the use of cable troughs which may be able to reduce the number of cables required to six in total. This method is generally used where the width of the cable corridor is restricted or where vegetative reinstatement is not required (for example along cycle trails or canal tow paths).

5.14 Each cable would be installed in an individual concrete trough; with a total single circuit trough width of typically 2m (a double circuit installation would require two of these). The trough is laid at a depth of approximately 1m and the achievable electrical rating is critically dependent on maintaining a constant minimum burial depth. As such any points/obstacles along a route normally necessitating deeper burial, such as under watercourses and roads, would require special design considerations. A cable trough construction swathe would be less than that of direct burial largely because there is less of a requirement for material storage on site.

5.15 In conjunction with direct burial and cable troughs, National Grid can use horizontal directional drilling (HDD) technology to negotiate steep topography and sensitive terrain. The directional drilling provides a bore beneath the sensitive /difficult area that the cable is then sleeved into using a biodegradable lubricant. There is no space available to accommodate a cable joint within the HDD bore. The maximum length that can be achieved with HDD techniques will be determined by the length of suitably rated cable that can be delivered to site on a single cable drum.

5.16 Where a river crossing may be required this could be either be achieved by HDD or, where steep gradients or lack of space render this technically unfeasible, a cable bridge could be installed.

5.17 The cable route would start where existing cables emerge from the eastern end of the Woodhead Tunnel. The existing SEC would be removed and a new SEC would need be located at the other end of the cable route, to achieve the transition from an overhead to an underground cable. A terminal pylon would form the end of the overhead line, with a fenced compound approximately 80m by 40m. A diagram of a typical SEC is shown in Figure 5.5, with a photograph of an existing compound in Figure 5.6. It is important to note that the designs for SECs do vary, and normally each compound is slightly different, the SEC is likely to be similar to the examples shown; however, the pylon is often contained within the compound.

**Figure 5.4 Typical underground cable construction swathe drawing**
Two indicative route options have been identified for an underground cable connection. These are described below and shown in Figure 5.7.

SEC Search Area A (for Option 3a) is located to the south of Townhead along the lower slopes of the Upper Don Valley. SEC Search Area B (for Option 3b) is also located towards the bottom of
the valley, to the south and east of Castle Hill (south of Carlecotes). These search areas have been defined to allow for a degree of flexibility and to minimise impacts on Wogden Foot, local wildlife site. They are also located outside the National Park boundary.

**Option 3a: Underground Cable - Direct burial/ cable trough (50% of subsection 4ZO.2)**

5.20 The underground cable connection would run broadly east from the eastern end of the Woodhead Tunnel. The new cable would be jointed to the existing cable which runs through the Woodhead Tunnel. The existing SEC (at Dunford Bridge) would be removed and replaced with a much smaller ‘jointing compound’. The cable would then potentially run either in troughs along the Trans Pennine Trail to the south of the river and/or small track to the north of the river, or, be directly buried under the fields to the north, emerging on the southern or northern banks of the Upper Don River. A river crossing may be required to connect to a new SEC in Search Area A (the precise location of the crossing would be chosen to reduce the visual impact of the compound and would avoid directly impacting on Wogden Foot Local Wildlife Site). This route is approximately 850m long.

**Option 3b: Underground Cable - Direct burial/ cable trough (100% of subsection 4ZO.2)**

5.21 As option 3a except that the cable would continue further east along the Trans Pennine Trail corridor emerging south of the river (in an area to the south of Castle Hill), before reconnecting with the overhead line. A new SEC would be sited in this area (the precise location would be chosen to reduce the visual impact of the compound from the National Park and surrounding visual receptors and would look to avoid directly impacting on Wogden Foot Local Wildlife Site). It should be noted that due to the restricted width of the Trans Pennine Trail at this location, it may not be possible to avoid direct impacts on Wogden Foot nature reserve. There may be a requirement for a river crossing dependant on where the SEC is sited. This route is approximately 2.6km long.

5.22 It is considered that both Options 3a and 3b have the potential to mitigate the impacts on the National Park sufficiently to be investigated further and this option is appraised in Section 6.
Figure 5.7: Potential Direct Burial Routes

- Study area
- Peak District NP
- Assessed National Grid 400kV overhead line subsection
- Other National Grid 400kV overhead line
- National Grid Dunford Bridge SEC
- Underground cable route
- 4Z0.2 Pylon
- Other OHL Pylon
- Potential route corridor option 3A
- Potential route corridor option 3B
- Sealing end search area

Source: Natural England, National Grid

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6 Appraisal of Preferred Options and Conclusion

Option 3: Underground Cable – Direct Burial/ Cable Trenches

6.1 Discussions between Gillespies and National Grid, informed by site visits in July 2015 and by the stakeholder engagement (Section 4), led to a decision on which solutions to pursue for subsection 4ZO.2 in the Peak District National Park. Sub-topics are only considered where they may influence the choice of option.

6.2 An underground cable connection was considered to be the most effective means of mitigating the landscape and visual impacts of this subsection of overhead line on the National Park. The remainder of this section describes the alternative means of achieving this. All routes shown are entirely indicative, and will be subject to detailed routeing and design if shown to be feasible.

Corridors and Search Areas

6.3 Two alternative corridors have been identified:

- Option 3a seeks to mitigate the highest impacts of subsection 4ZO.2 which are experienced in and immediately around Dunford Bridge. This corridor runs from the existing SEC to an area south of Townhead and encompasses a relatively wide corridor to allow for exploration of routes to the north and south of the Upper Don River; and
- Option 3b is a longer option which seeks to mitigate the full length of subsection 4ZO.2.

6.4 Two search areas for SECs have been identified in relation to the above as follows:

- Search Area A identified for Option 3a is located to the south of Townhead; and
- Search Area B identified for Option 3b is located to the south of Castle Hill.

6.5 The corridors and search areas are shown in Figure 5.7.

Appraisal

Landscape and Visual

6.6 The longer Option 3b is likely to have greater benefits on the landscape and setting of the National Park. This option would result in the removal of the existing SEC at Dunford Bridge, up to ten pylons, and 2.6km of overhead line from the sensitive Dark Peak Moorland Slopes & Cloughs and Dark Peak Yorkshire Fringe Slopes & Valleys with Woodland LCTs. Visual amenity benefits on receptors in the National Park would not vary greatly from those of the shorter Option 3a which would mitigate impacts on views from the community and visitors to Dunford Bridge and users of trails and cycle ways including Trans Pennine Trail and National Cycle Route 62, National Cycle Route 68, the Barnsley Boundary Walk and the Upper Don Valley Trail. The shorter option (3a) would remove the existing SEC at Dunford Bridge, up to five pylons, and approximately 850m of overhead line from the sensitive Dark Peak Moorland Slopes & Cloughs and Dark Peak Yorkshire Fringe Slopes & Valleys with Woodland LCTs.

6.7 Although sited low in the valley the presence of a SEC in Search Area A could have some effects on views from several farmsteads to the north (around Townhead) and would be visible from a small section of Brook Hill Lane. Dependant on the requirements for vegetation removal, existing vegetation along the Trans Pennine Trail would potentially screen most views from users of the trail. A SEC to the south of Castle Hill (Search Area B) would be located at a greater distance from residential properties; however, it would be visible from the southern edge of Carlecotes and surrounding isolated properties and there may be more potential for views from less vegetated sections along the Trans Pennine Trail in the short term (until mitigation planting matures). Access to construct a SEC in either search area may be an issue as the valley sides are relatively steep and existing access limited. Access to SEC search area A may be slightly easier as there is
a small unsurfaced access track to the north of the river; however, this may prove too narrow for construction vehicles.

**Ecology**

6.8 The longer Option 3b would give rise to a greater level of disturbance to habitats along the cable corridor, including impacts on Wogden Foot Local Wildlife Site as the trail narrows at this point. Option 3b may also cause disturbance to wildflower meadow areas created by local volunteers along the Trans Pennine Trail (between Hazlehead Station and Wogden Foot) depending on access requirements along the Trail. Both options are circa 250m from South Pennine Moors SAC, Peak District Moors (South Pennine Moors Phase 1) SPA and Dark Peak SSSI to the west, which are unlikely to be directly affected.

6.9 Search Areas A and B are located within pasture land, the construction of a SEC would be unlikely to impact on important habitats; although the siting of a SEC to the west of search area B may impact on Wodgden Foot due to the need to get cables from the Trans Pennine Trail down to the SEC. Further investigation of the areas would be needed to identify species and habitats in detail.

**Historic Environment**

6.10 The corridors and search areas avoid the listed buildings in the area, and therefore direct impacts on these are not anticipated. Detailed siting and design would look to minimise impacts on the setting of any listed buildings.

6.11 Both options have potential to adversely impact undesignated archaeology in the area. Options 3a and 3b both have potential to impact industrial archaeology under the old railway line and in addition to this Option 3a also has potential to impact on unrecorded prehistoric archaeology and historical field systems to the north.

6.12 Further research would indicate the potential for undiscovered archaeology along the corridors.

**Other Environmental Topics**

6.13 Disruption to the limestone ballast at Wogden Foot and other areas adjacent to the river may have adverse impacts on the water quality of the Upper Don River. Further detailed investigation would be needed to identify the risks.

**Socio-Economic Appraisal**

6.14 Option 3a has greater potential to impact on agriculture in the area as it encompasses several grazing fields. Both routes would have impacts on the Trans Pennine Trail and would result in the requirement for a temporary diversion of a section of the Trail. A potential diversion has been identified but may require remedial/upgrading of existing trails/footpaths and must be suitable for all users of the Trans Pennine Trail; improvement works would need to be carried out well in advance of the temporary diversion and construction works to the line. Both options have the potential to significantly benefit tourism in the area, in particular around Dunford Bridge which has tourism potential (there are several existing car parks, access and links to numerous national and regional trails).

**Technical Appraisal**

6.15 The extension of the existing cables installed in the Woodhead Tunnel to a location further east is technically achievable and would result in the removal of the current cable SEC. Twelve HV cables would need to be installed to ensure there are no restrictions on the capacity of the existing line. The use of cable technology is suitable to achieve this option, but further detailed assessment would be required to ensure that network capacity isn’t unduly affected. Shunt reactors may be required on the electricity network in order to compensate for the electrical properties of the cable.

6.16 During the construction period, access for heavy vehicles and plant would be required along the proposed cable route. This would necessitate the temporary closure of the Trans Pennine Trail at this location for the duration of the construction activities. Access to the location is not considered to be a concern with adequate road links to the A628 to the west and the A616 in the east.

6.17 The route of the existing cables would need to be diverted out of the tunnel, and can be laid within the route of the former railway line, now the Trans Pennine Trail. This routing would reduce the width in which the cables could be installed and this may necessitate the use of a cable
troughs. Utilising routes in agricultural land remain an option, however it may pose greater challenges with respect to gradients and side slopes.

6.18 For Options 3a and 3b the cables may need to cross the Upper Don River and this would need to be subject to more detailed technical assessment and may require a cable bridge or HDD technology depending on space and gradients.

6.19 For both options a permanent access track would need to be constructed. It may be possible to utilise the Trans Pennine Trail to access the SEC for both options, however if this is not possible, then an alternative route would need to be identified.

6.20 On completion of the construction activities, up to five pylons would be removed in option 3a and up to ten pylons would be removed in option 3b. The ground would be reinstated.

Overall Conclusion

6.21 This section of the report has presented the options which seems to be the most feasible for addressing the visual impact of this existing subsection of National Grid overhead line.

6.22 Option 3b is approximately three times longer than shorter Option 3a. Although this longer option would remove the entire length of the subsection it is not considered to provide proportionately more mitigation benefits than Option 3a. As described previously, the greatest landscape and visual impacts occur in the west around Dunford Bridge; and these impacts could be mitigated by Option 3a. As Option 3a is much shorter it is anticipated to be preferable on economic and efficiency grounds; in particular due to the fact that Option 3b provides only marginally more landscape and visual benefits.

6.23 It is proposed that, should the VIP Stakeholder Advisory Group recommend to National Grid that 4ZO.2 be taken forward into the next stage of the VIP process, National Grid would work closely with the local stakeholders in identifying a specific route alignment and location for the SEC within the search areas. In order to do this, it would be necessary to undertake physical site investigations (such as borehole surveys). The provision of this information would inform further decision making, again through the Stakeholder Advisory Group, for progressing this project under VIP.
### Appendix 1:-Summary of Potential Primary Consenting Requirements

<table>
<thead>
<tr>
<th>Consent</th>
<th>1: OHL (Alternative Pylon Design) along <strong>Existing Alignment</strong></th>
<th>2: OHL (Alternative Pylon / Conventional Lattice Design) along <strong>Alternative Alignment</strong></th>
<th>3a: <strong>Underground cables</strong> (direct burial) 50% of 4ZO.2</th>
<th>3b: <strong>Underground cables</strong> (direct burial) 100% of 4ZO.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Consent Order (DCO) under the Planning Act 2008 (as amended)</td>
<td>Required if new line is &gt;2km (i.e. extends to Castle Hill) and defined as a Nationally Significant Infrastructure Project (NSIP).</td>
<td>Required if new line is &gt;2km</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Town and Country Planning Act (T&amp;CPA) 1990 (as amended)</td>
<td>n/a</td>
<td>n/a</td>
<td>Required for sealing end compounds (SECs)</td>
<td>Required for sealing end compounds (SECs)</td>
</tr>
<tr>
<td>Section 37 (S37) Electricity Act 1989 (as amended)</td>
<td>May be required if new line &lt;2km long (i.e. stops west of Castle Hill)</td>
<td>May be required if new line &lt;2km long</td>
<td>Potentially if diversion to new SEC required</td>
<td>Potentially if diversion to new SEC required</td>
</tr>
<tr>
<td>Environmental Impact Assessment (EIA) Regulations (various) Development</td>
<td>Likely, due to sensitivity of environment (Schedule 3 criteria)</td>
<td>Likely, due to sensitivity of environment (Schedule 3 criteria)</td>
<td>Likely, due to sensitivity of environment (Schedule 3 criteria)</td>
<td>Likely, due to sensitivity of environment (Schedule 3 criteria)</td>
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<tr>
<td>‘Appropriate Assessment’ under Habitat Regulations 2010</td>
<td>Unlikely, but subject to screening</td>
<td>Unlikely, but subject to screening</td>
<td>Unlikely, but subject to screening</td>
<td>Unlikely, but subject to screening</td>
</tr>
<tr>
<td>Permitted Development (PD) Rights under T&amp;CP (General Permitted Development) Order 1995</td>
<td>n/a</td>
<td>n/a</td>
<td>Screening of PD rights for cable (subject to restrictions and conditions).</td>
<td>Screening of PD rights for cable (subject to restrictions and conditions).</td>
</tr>
</tbody>
</table>