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 and the stakeholder reference group for providing background information.

Front Cover: View of 4ZO.3 from the Trans Pennine Trail, National Cycle Route 62 and Longdendale Trail above the eastern entrance to the Woodhead Tunnel at the head of the Longdendale Valley.
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>
1.6 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.

1.7 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.

1.8 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).

1.9 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 (West) Project

1.10 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. Subsections 4ZO.3 and 4ZO.4 run westwards from a sealing end compound (SEC) near to the western entrance of the Woodhead Tunnel and down the Longendale Valley past Torside Reservoir to Tintwistle. The combined length of these two identified subsections of line is 9.2km, and they are shown in the context of the National Park in **Figure 1.1**.

1.11 This report draws on the National Grid’s 2012 long term future study for this overhead line\(^1\) (‘the 2012 Report’). This is available on VIP section of National Grid’s website for reference. The 2012

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\(^1\) Stalybridge to Woodhead (4ZO) 400kV Line Long Term Future Study, Draft Final Report National Grid, June 2012
Report was prepared to present options to secure the long term future of the line. The output of the report is discussed further in Section 5 and has informed the options discussed in this study.
Figure 1.1: Subsections 4ZO.3 & 4ZO.4 within Peak District National Park

Source: Natural England, National Grid
Peak District National Park

1.12 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”

1.13 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.

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2 http://www.nationalparks.gov.uk/learningabout/whatisanationalpark/aimsandpurposesofnationalparks
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 landscape and visual impact assessment Technical Report\(^4\). The summary sections relating to the 4ZO.3 and 4ZO.4 subsections are reproduced below.

**4ZO.3** is judged to have landscape impacts of a very high level of importance on the Dark Peak reservoir valleys with woodland, and adjacent Dark Peak moorland slopes and cloughs, landscape character areas. The line is poorly accommodated in this landscape which has a distinctive sense of place and is highly valued, partly for its scenic quality and the fact that it displays a number of the special qualities of the Peak District, but also because it is has high conservation and recreational value. The interaction between the landform of the valley floor and moorlands slopes and cloughs is complex and has required the use of a relatively high number of heavier angle pylons which serves to increase the impact of the line along the entire upper Longdendale Valley.

This subsection is also judged to have visual impacts that are of a very high level of importance. The impact of the pylon line on views is mostly experienced by recreational users of the Trans-Pennine Trail, National Cycle Route 62 and Longdendale Trail regional trail as the line runs very close to and broadly parallel with these routes along the entire length of the upper Longdendale Valley. The terminal pylon, associated SEC and concrete cable cover are particularly intrusive and have a very high scale of impact on views from nearby locations, which are experienced by high numbers of trail users. It is also recognised that the A628 is popular as a driving route. After crossing the high Pennine moorland, road users travelling westwards follow the narrow valley of the River Etherow around Ironbower Moss and are suddenly presented with dramatic westerly views down the Longdendale Valley with its chain of reservoirs. On clear days, the skyline of Greater Manchester is visible in the distance. The line zig-zags down the valley which creates a ‘stacking’ effect and increases the visibility and impact of the pylons, even though they are mainly backclothed. There are also judged to be visual impacts of high importance on people using open access land and local rights of way in the area.

**4ZO.4** runs through the Dark Peak reservoir valleys with woodland landscape character area, and partially through the Dark Peak Western Fringe riverside meadows and Dark Peak Western Fringe valley pastures with industry landscape character areas. This landscape is attractive and unsettled with areas of remoteness and tranquillity found up on the moors and in sheltered, well-wooded areas. The landscape has a distinctive sense of place and is highly valued, partly for its scenic quality and the fact that it displays a number of the special qualities of the Peak District, but also because it has high conservation and recreational value. The complex landform along the valley floor has required the use of a relatively high number of heavier angle pylons, which serves to increase the impact of the line on the landscape of the lower Longdendale Valley. This subsection is judged to have landscape impacts of high importance.

The majority of people affected by visual impacts are the large numbers of walkers and cyclists on the Trans-Pennine Trail National Cycle Route 62 as the line runs very close and broadly parallel with this route along the entire length of the lower Longdendale Valley. There are judged to be visual impacts of very high importance on these trails and cycleways. There are also judged to be visual impacts of high importance on people using open access land and local rights of way in the area.

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Figure 1.2 View of 4ZO.3 from the Trans Pennine Trail, National Cycle Route 62 and Longdendale Trail above the western entrance to the Woodhead Tunnel at the head of the Longdendale Valley.

Figure 1.3 View of 4ZO.4 from a section of the Pennine Way National Trail on Torside Reservoir Dam.
2 Methodology

2.1 This study identifies potentially feasible ways of mitigating the identified impacts of the 4ZO.3/4ZO.4 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 the sub-topics shown 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 issues</td>
<td>Ecology</td>
<td>Aviation and defence</td>
</tr>
<tr>
<td>Suitability of technology</td>
<td>Historic environment</td>
<td>Traffic and transport</td>
</tr>
<tr>
<td>Network capacity</td>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Network efficiencies/benefits</td>
<td>Local air quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Noise and vibration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soils and geology</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 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.
3 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 4ZO route is an integral part of the National Electricity infrastructure and any potential options as part of this project would need to be designed to meet the capability of the existing infrastructure.

Study Area

3.3 The study area has been defined based on the extent of subsections 4ZO.3 and 4ZO.4, which were assessed as having the greatest impacts on landscape and visual amenity. For the purpose of this report subsections 4ZO.3 and 4ZO.4 are assessed as one long subsection which runs down the Longdendale Valley from the Woodhead Pass in the east to Tintwistle in the west; as shown in Figure 1.1. Subsection 4ZO.5 takes the line out of the Longdendale Valley to the north past Tintwistle before leaving the National Park boundary, though 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:
   - Hadfield to the west;
   - The upper slopes of the Longdendale Valley and Arnfield Moor to the north (approximately 1km from subsections 4ZO.3 and 4ZO.4);
   - 500m from the eastern end of subsection 4ZO.3; and
   - The slopes of the Longdendale Valley to the south (circa. 500m from subsection 4ZO.3 and part of 4ZO.4 to Torside Reservoir and circa. 1km from the rest of 4ZO.4).

3.5 The resulting study area is shown in Figure 3.1. The rest of this section outlines features 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

3.6 The environmental baseline described below has been informed by the 2012 Report together with up to date desk and site based research and analysis. More detailed background information can be found in the 2012 Report which is available on the VIP section of National Grid’s website.

Landscape and visual

3.7 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.\(^5\)

3.8 The 400kV OHL runs from a SEC near to the western entrance of the Woodhead Tunnel, then along the Longdendale Valley to Tintwistle.

Landscape Character

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

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). Much of the line lies within the *Dark Peak Reservoir Valleys with Woodland* LCT with small parts fringing along the *Dark Peak Moorland Slopes & Cloughs* LCT. The far western tip of the subsection lies just within the *Dark Peak Western Fringe Riverside Meadows* and *Dark Peak Western Fringe Valley Pastures with Industry* LCTs. LCTs are illustrated on Figure 3.2.

3.11 The landscape of the study area consists of a steep sided valley dominated by large reservoirs. The steeply sloping and undulating valley sides are dissected by narrow stream valleys (cloughs) and some of the valley sides have been planted with interlocking blocks of coniferous and mixed plantation woodland while others support acid grassland and clough woodlands. To the north and south, the steeper slopes and cloughs rise to open moorland on the high plateaux above. Landcover within the valley also comprises pastoral fields bounded by gritstone walls. With the exception of the small settlement of Tintwistle to the west (and other larger settlements which are located outside the National Park) the Longdendale Valley is sparsely settled. The valley has a strong and distinctive sense of place and is valued for its scenic qualities and high conservation and low key recreational value. The scenic quality and tranquillity of the valley is interrupted by the presence of pylons and also traffic on the A628 Woodhead Pass (a main road which also runs along the length of the valley); although pockets of tranquillity remain up on the moors and within sheltered, well-wooded areas.

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, 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

Source: Natural England, National Grid, LCA - Peak District NP
3.14 People within the National Park who experience these views primarily include residents of Tintwistle as well as the few people living in the scattered farmsteads and properties within the Longdendale Valley. Residents of built up areas outside the National Park to the west, including people living in and around Hadfield, also have views of the line. The presence of pylons also affects the experience of visitors who participate in watersports on the reservoirs. Motorists on the busy A628 Woodhead Pass, few local lanes and users of the Trans Pennine Trail National Cycle Route 62, European Long Distance Footpath E8, The Longdendale Trail and also the Pennine Way National Trail often have clear foreground views of pylons.

**Ecology**

3.15 The moorland within 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.

3.16 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 heather (*Erica tetralix*) and transition mires and quaking bogs. These are all Annex I habitats which are protected under the EU 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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6 South Pennine Moors SAC, JNCC. http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=UK0030280
3.17 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*).\(^7\)

3.18 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.\(^8\)

3.19 There are areas of Ancient Woodland within the study area (much of which is found to the north of Rhodeswood Reservoir).

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

**Historic Environment**

3.21 One Scheduled Ancient Monument (SAM) lies within the study area SAM (1019061) which is the site of the earthwork and buried remains of Hightones Roman fortlet on the gentle south facing slope to the north of Torside Reservoir. There are 21 Grade II listed buildings within the study area concentrated around Crowden, Tintwistle and Hadfield. Much of Tintwistle is also locally designated as a Conservation Area. There is a high possibility that unrecorded industrial archaeology exists under the old railway line. The SAM and listed buildings are shown on Figure 3.4.

3.22 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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\(^7\) Peak District Moors (South Pennine Moors Phase 1) SPZ Citation
http://publications.naturalengland.org.uk/publication/614589668169728

\(^8\) http://www.sssi.naturalengland.org.uk/citation/citation_photo/1003028.pdf
Figure 3.4: Historic Environment

- Study area
- Peak District NP
- National Grid Woodhead Tunnel SEC
- Assessed National Grid 400kV overhead line subsections
- Underground cable route
- Other National Grid 400kV overhead line
- 4ZO.3 & 4ZO.4 Pylon
- Other OHL Pylon

Historic Environment
- Scheduled Monument (SAM)
- Registered Parks & Gardens
- Listed Building

Source: Natural England, Historic England, National Grid
Water

3.23 The Environment Agency’s Flood Map shows zones which have a ‘Medium’ or ‘High’ risk of flooding (‘Risk of Flooding from Rivers and Sea’) along the River Etherow and around the following reservoirs: Woodhead Reservoir; Torside Reservoir; Rhodeswood Reservoir; Valehouse Reservoir and, Bottoms Reservoir.9

Soils and Geology

3.24 The bedrock underlying most of the area comprises Millstone Grit of the Hebden Formation (mudstone and siltstone), Shale Grit (sandstone) and Lower Kinderscout Grit (sandstone). There are superficial deposits of Alluvium (clay, silty), Alluvial Fan Deposits (clay, sand and gravel) and Head (diamicton) and also superficial deposits of peat on the moorland.

Other Environmental Issues

3.25 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

3.26 Socio-economic activity is mainly restricted to farming activities with the land being used for grazing. Farmland around subsections 4ZO.3/ 4ZO.4 is classified as low grade 4 or 510.

3.27 There is a camping/ caravan site at Crowden. The Old House B&B and tearoom is located on Woodhead Road, Torside to the south of Rhodeswood Reservoir. The YHA hostel at Crowden was closed in 2014 and is now managed by Rotherham Metropolitan Council for group bookings only.

3.28 There is a pub in Tintwistle (The Bulls Head). A road side/ truck stop cafe is located in layby/ parking area just off the A628 at the head of the Longdendale Valley.

3.29 The Boar Clay Shooting Ground is located adjacent to Torside Reservoir.

3.30 The Glossop and District Sailing Club is based at Torside Reservoir, is a community amateur sports club, run on a not-for-profit basis by its members.

Traffic and Transport

3.31 With the exception of the A628 Woodhead Pass, which is a well-used single carriageway road, the road network in the study area is limited to just a few lanes/ unclassified roads which link the scattered individual farmsteads and properties.

3.32 Impacts of construction activity on the restricted road network are likely to be a concern if extensive mitigation works were undertaken.

Access and Recreation

3.33 The Trans Pennine Trail National Cycle Route 62 largely follows the route of the old railway line and the Longdendale Trail (regional trail) from west to east. The Trans Pennine Trail also forms part of European Long Distance Footpath E8.

3.34 The Pennine Way National Trail crosses the Longdendale Valley, descending from Black Hill in the north and ascending Bleaklow in the south.

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9 http://watermaps.environment-agency.gov.uk/wiwy/wiwy.aspx?lang=_e&topic=floodmap&layer=default&scale=8&x=404259&y=397322#x=405509&y=396352&scale=8
10 http://publications.naturalengland.org.uk/publication/6172638548328448
3.35 The Pennine Bridleway National Trail skirts along and inside the National Park boundary to the west of Tintwistle Low Moor; it passes through Tintwistle and along Bottoms Reservoir Dam.

3.36 The Etherow – Goyt Valley Way regional trail links Stockport to Longdendale and enters the National Park in the west near Bottoms Reservoir. This trail links with the Trans Pennine Trail and Longdendale Trail.

3.37 There are a number of local Public Rights of Way in the area and large tracts of Open Access Land along the upper valley slopes and up on the moorlands.

3.38 There is caravan/ campsite, public toilets, car park and picnic area at Crowden (north of Torside Reservoir) and a B&B/ tearoom to the south of Rhodeswood Reservoir.

3.39 There is a sailing club (Glossop and District Sailing Club) and picnic area at Torside Reservoir.

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

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 National Grid has undertaken a significant amount of technical work in the Longdendale Valley over the last 10 years and a number of potential options for the transmission line have been thoroughly assessed in consultation with local stakeholders and communities.

4.5 Following discussion with the Peak District National Park Authority, it was decided that an independently facilitated workshop would be arranged to review and consider the options for the shortlisted section of line to the west of the Woodhead Tunnel. The aim of the workshop would be to reach consensus among the assembled stakeholders based on these potential options.

4.6 The workshop was held on 24 March 2015 at Halifax Hall in Sheffield and was independently facilitated by The Good Partnership.

4.7 The workshop ran from 9.00am until 4.00pm and was attended by local stakeholders including Peak District NPA officers and representatives from Trans Pennine Trail, Friends of the Peak District, CPRE, Place, Natural England and United Utilities. Representatives from National Grid and Camargue were also in attendance. Chris Baines, Chairman of the Stakeholder Advisory Group, and Neil Sinden, CPRE’s representative on the Group were invited to observe the meeting.

4.8 The full report is available on the VIP section of National Grid’s website. The following key issues were discussed:

- The stakeholders reached consensus, prioritising the removal of the pylons to the west of the Woodhead Tunnel through direct burial and cable troughs, followed by exploring the potential for removing the pylons to the east of the Woodhead Tunnel.

- The group wanted National Grid to consider the line of pylons beyond the shortlisted line which are situated across the reservoir and towards the boundary of the National Park to help mitigate the visual impact of the potential sealing end compound to the west of the Woodhead Tunnel. This would require a solution that crossed Bottoms Reservoir.

- As part of any undergrounding solution from the end of Woodhead Tunnel to Bottoms Reservoir, the group made it clear that Trans Pennine Trail would need to be adequately restored.
A number of stakeholders suggested an alternative route for National Grid to consider. For example, a route along the A628 corridor (along the north coast of reservoir) to Crowden Crossing and crossing the moor.

A public drop in event for residents living near the section of line to the west of the Woodhead Tunnel would take place as soon as practically possible.

Engagement events for Peak District East would take place 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

4.9 On the advice of local stakeholders, the drop in event took place on Wednesday 29th March 2015. The drop in event was held at Christ Church in Tintwistle, a venue close to the community who live near the shortlisted section of line to the west of the Woodhead Tunnel.

4.10 The drop in event ran from 2.00pm until 8.00pm and was staffed by representatives from National Grid (VIP project team) along with Camargue. It was attended by a small number of people from the local community including residents from Tintwistle. In total, 16 people attended the event.

4.11 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.

4.12 A press release was produced and issued to local print and broadcast media.

Feedback from the Drop-in Event

4.13 Only two feedback forms were completed at this 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.
- One respondent felt that the disruption caused by the construction traffic would be worthwhile for improving the landscape.
• Some respondents felt that locally there was the support for the removal of the pylons but National Grid would need to consider the potential environmental damage should the section of line be undergrounded.

• One respondent suggested building a bridge to carry the cables across the Bottoms Reservoir.
5 Potential Mitigation Solutions

Introduction

5.1 'The 2012 Report' considered a range of possible options that could provide a long term replacement electricity transmission route for the existing line along the 4ZO route. Nine alternative options were identified for the purposes of consultation and inclusion in the study. The theoretical options that were evaluated are as follows:

- Option 1: Replacement of existing pylons in situ;
- Option 2: Temporary direct overhead line from Woodhead Tunnel to the boundary of the National Park and then replace the line in situ;
- Option 3: Permanent replacement overhead line from Woodhead Tunnel to the boundary of the National Park;
- Option 4: Direct buried underground cable installation;
- Option 5: Surface mounted trough cable installation;
- Option 6: Combined submarine (via public water supply reservoirs)/terrestrial underground cable);
- Option 7: Direct deep tunnel from Woodhead Tunnel to the boundary of the National Park;
- Option 8: Overhead line north around the National Park; and
- Option 9: Rising bore from Woodhead then direct burial across the moor (10km).

5.2 Alternative route options for underground cable were also initially explored but rejected. These included: cable burial within the A628 (discounted because of closure disruption to the heavily used A628); cable burial between the A628 and the reservoirs (discounted because of reservoir control systems and potential pollution risk) and cable burial north of the A628 (discounted because of the steep gradients/technical feasibility and site designations).

5.3 Following the initial assessment of all options, Options 2, 3, 6, 7, 8 and 9 above were discounted in the report due to a number of factors (refer Section 5.2 of the 2012 Report). The remaining three options were considered to be more suitable for further evaluation and are elaborated as follows:

- Option 1 Replace existing L6 overhead line in situ;
- Option 4 Construct predominantly direct buried cable route, in a two cables per phase configuration; and
- Option 5 Construct surface mounted cable trough route, in a single cable per phase configuration.

5.4 The report recognised that Option 1 (replacement of existing pylons in situ) would not mitigate the landscape and visual impacts of the line on the Peak District National Park. Whilst this 'like-for-like' replacement obviously would not satisfy the current VIP remit, it is also considered that the replacement of standard lattice pylons with alternative pylon designs would also not achieve sufficient mitigation of the landscape and visual effects, hence this option is not considered further.

5.5 This Options Appraisal Study therefore considers just one option comprising an underground solution which may be achieved by either Option 4 or Option 5 of the 2012 Report, or a combination of both.

5.6 Discussions with United Utilities and initial site investigations in July 2015 have highlighted significant technical challenges with crossing the reservoirs. The reservoirs are the primary source
of drinking water to east side of Manchester and surrounding area and, as such, any works in this catchment would be need to ensure that there was no adverse effect on either the quantity or quality of the water. Potential methods of crossing the reservoirs would be via a cable bridge or a cable tunnel.

5.7 Due to the weight of the cables, the topography of the area and the span length, the cable bridge design would be required to be robust in its nature. To avoid any central pillars, a relatively long deck would be required with supporting arch. For this reason, crossing the reservoirs using a cable bridge is not thought to be an appropriate method of crossing the reservoirs while reducing the visual impact.

5.8 A cable tunnel is a technical solution for crossing the reservoirs. Due to the land form and topography, the access/ reception shafts may be required to be in excess of 100m deep to negate any impact on either the reservoirs or the dam structures. Head houses and a cable sealing end would also be required.

5.9 A number of suggestions have been made to cross from the south of the valley to the north by installing cables in the dam structures, or on the land close to Crowden. While these are technical solutions, further discussions would be needed with United Utilities to ascertain the impacts on their infrastructure assets in this area. Previous work noted in 2012 report identified serious concerns held by United Utilities. In particular the report says that the dam structures consist of a clay core and extend deep into the adjacent valley. Installing cables within the structure would not be feasible or acceptable. It is noted that to the land between the reservoirs and the A628 contains the safety by-wash channels for the reservoirs, and crossing them would prove a serious impediment to the periodic cleaning (e.g silt removal). On the basis of the above points, options that cross the dam structures have not been considered further.

5.10 With reference to the Crowden crossing option, further more detailed geotechnical assessment would be required to ascertain if this is technically achievable to maintain the required cable rating. This option would require crossing the by-wash channels, then run parallel to them in very close proximity. This option would then require installation of cables across relatively steep side slopes that would increase the civil engineering work for the length of the remaining section. Utilising horizontal directional drills (HDD) and/or cable bridges would be required to overcome these challenges. On the basis of these significant technical challenges, utilising the Crowden crossing is not thought to be an appropriate method to cross the valley.

5.11 Following discussions between Gillespies and National Grid and a joint site visit, SEC search areas have been identified for this option (Option 4/5 of the 2012 report). The potential route corridor and SEC search areas for Option 4/5 are illustrated in Figure 5.4.

5.12 The route and SEC search areas shown are entirely indicative, and will be subject to detailed route design if shown to be feasible. Construction and operational impacts were included in the consideration of these potential solutions in the 2012 Report. Decommissioning of the existing line has not been factored in at this appraisal stage as it is unlikely to be a determining factor when comparatively appraising mitigation options. However, the following paragraph outlines the envisaged decommissioning process of the redundant infrastructure once the new connection is operational.

5.13 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 more open areas it may be possible to cut the pylon at the base and then pull the pylon to the ground using a tractor before cutting it into sections. A decision as to whether pylon foundations would be left in the ground would have to be made based on full consideration of all the issues, including stakeholder, landowner and environmental concerns.

5.14 For the mitigation options identified it may be necessary for the erection of temporary structures whilst the SEC 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 4/5: Underground Cable – Direct Burial/ Cable Troughs**

5.15 In this option an underground cable connection would replace all or part of the 4ZO.3 and 4ZO.4 subsections of overhead line.

5.16 Direct burial of an underground cable would require a construction corridor typically 30-50m wide along the length of the cable trench. This width is required to accommodate the cable trench, haul road, storage areas for stripped topsoil and subsoil from the cable trench excavation and inclusion of any temporary and permanent land drainage requirements. Where necessary (for example, where the cable corridor is specifically restricted) this cable width could be reduced. 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 5.1** shows a typical cross section for underground cable construction.

5.17 An alternative to direct burial is the use of cable troughs. This method is generally used where the width of the cable corridor is restricted or where reinstatement of vegetation is not required (for example along cycle trails or canal tow paths).

5.18 Each cable would be installed in an individual concrete trough; with a total single circuit trough width of typically 2m for a 6 cable option (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 dependant 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 narrower than that of direct burial largely because there is less of a requirement for material storage on site.

5.19 The cable route would start where existing cables emerge from the western end of the Woodhead Tunnel. The existing SEC would be removed. A new SEC would need to be located at the western 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 5.2**, with a photograph of an existing compound in **Figure 5.3**. 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; and the pylon is often contained within the compound.

**Figure 5.1 Typical underground cable construction swathe drawing**
Figure 5.2 Diagram of a typical sealing end compound

Example sealing end compound

- We will use land form and planting to help limit visual impact
- Security fence approx 2.8m high
- Steel gantry supports ‘down-droppers’ and connection to underground cable sealing ends
- Surge diverters provide electrical protection for underground cables
- Sealing end compounds for the Visual Impact Provision project are likely to have a footprint of approximately 80m x 40m and include 12 cables
- Overhead line terminates at pylon and ‘down-droppers’ connect to steel gantry

Figure 5.3 An operational sealing end compound
Option 4/5a: Underground Cable - Direct burial/ cable trough (to south of Bottoms Reservoir)

5.20 The underground cable connection would run broadly west from the western end of the Woodhead Tunnel. The new cables would be jointed to the existing cables which run through the Woodhead Tunnel. The existing SEC (at the head of the valley) would be removed and replaced with a smaller jointing compound structure. The cable would then run in either troughs or be directly buried alongside/ under the Trans Pennine Trail, emerging on the southern banks of Valehouse Reservoir/ Bottoms Reservoir to SEC Search Area A as illustrated in Figure 5.4. The precise location of the SEC would be chosen to reduce the landscape visual impact of the compound. This route is between approximately 8.9km long.

This option has been considered further in chapter 6.

Option 4/5b: Underground Cable - Direct burial/ cable trough (to north of Bottoms Reservoir)

5.21 Option 4/5b would follow the same corridor set out in option 4/5a from the Woodhead SEC in the east but would extend the underground cable connection under Bottoms Reservoir to Search Area B near to Arnfield reservoir (which lies to the west of Tintwistle). The cable would cross the reservoir in a north westerly direction before diverting around the east of Tintwistle and then turning west towards an appropriately chosen SEC location. This route is up to 11.6km depending on where the SEC is sited.

Due to the complexity of crossing the reservoir for the reasons stated in paragraphs 5.7, 5.8 and 5.9 above, this option has not been considered further.
6 Appraisal of Preferred Options and Conclusion

Option 4/5a: Underground Cable – Direct Burial/ Cable Troughs

6.1 An underground cable connection was considered to be the most effective means of mitigating the landscape and visual impacts of these subsections of overhead line on the National Park. The remainder of this section describes the means of achieving this. The route shown is entirely indicative, and will be subject to detailed routeing and design if shown to be feasible.

Corridors and Search Areas

6.2 Option 4/5a has been identified as the preferred option to mitigate the landscape and visual impacts of subsections 4ZO.3 and 4ZO.4 (4ZO.3/4) on the National Park. This option involves direct burial/ cable troughs largely within the same corridor as the Trans Pennine Trail (along the former railway line). It runs from the existing Woodhead SEC down the Longdendale Valley to an area south of Valehouse Reservoir/ Bottoms Reservoir.

6.3 SEC Search Area A is located to the south of Valehouse Reservoir/ Bottoms Reservoir.

6.4 The corridor and search area are shown in Figure 5.4.

Appraisal

Landscape and Visual

6.5 Undergrounding along a similar corridor as the Trans Pennine Trail would remove up to 29 pylons and 8.9km of overhead line from the National Park and the Dark Peak Moorland Slopes & Cloughs and Dark Peak Reservoir Valleys with Woodland LCTs. It would also mitigate impacts on views from the following: users of trails, cycle ways and other rights of way and Open Access Land (most notably including the Trans Pennine Trail, National Cycle Route 62, the Longdendale Trail and the Pennine Way National Trail); recreational users such as those sailing on Torside Reservoir; and the local community (albeit a relatively sparsely settled landscape).

6.6 Although sited lower down the sides of the valley the presence of a SEC in Search Area A could have effects on views from several isolated properties to the south of the reservoirs, on views from properties within and around Tintwistle to the north and on views from users of the Pennine Bridleway National Trail and other rights of way and areas of Open Access Land. Dependant on the requirements for vegetation removal views from users of the Trans Pennine Trail/ Longdendale Trail may be partially screened by existing vegetation and/ or by mitigation planting as it matures. Any localised long term impacts arising from the SEC may be reduced through sensitive design, siting and screening; however, there is no readily obvious location for such a compound to the west of 4ZO.4. Although closer to the outer urban fringes of the National Park the western half of the search area comprises open sloping pastoral fields bounded by stone walls which are highly visible from surrounding areas. There is greater potential to screen a SEC in the eastern half of the search area; however, this area is considered relatively tranquil and also comprises scattered/ isolated properties. Localised short term landscape and visual effects may arise from the removal of the existing line as vegetation removal may be required for access.

Ecology

6.7 The 2012 Report acknowledges that there may be some direct impacts on the South Pennine Moors SAC; Peak District Moors (South Pennine Moors Phase 1) SPA and Dark Peak SSSI as well as impacts on local habitats and protected species (refer Section 6.3 of the 2012 Report).

6.8 Search Area A is located within pasture land, the construction of the SEC would be less likely to impact on the SAC, SPA or SSSI; however further investigation of the areas would be needed to identify species and habitats in detail.
**Historic Environment**

6.9 The 2012 Report identifies that this option has potential to adversely impact undesignated archaeology in the area in particular in relation to industrial archaeology associated with the old railway line. It is recognised however that the removal of this section of line would have a positive impact on some archaeological and cultural heritage features including Listed Buildings and reservoirs.

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

**Socio-Economic Appraisal**

6.11 This option would have significant short term impacts (potentially up to 5 years) on the Trans Pennine Trail/ Longdendale Trail as it would result in the requirement for a temporary diversion of up to 9km of the trail. A potential diversion is possible to the north of the reservoirs along the Northern Horse Route (a permissive riding route along the north side of the Longdendale Valley – developed by United Utilities) but this may require remedial works/ upgrading and may not be to the same standard as the Trans Pennine Trail/ Longdendale Trail. Upon completion this option has potential to enhance the local economy in the medium to long term as it will increase the perceptual and aesthetic qualities of the valley.

6.12 As highlighted in the 2012 Report the Trans Pennine Trail/ Longdendale Trail follows the route of the former Woodhead railway between Manchester and Sheffield. The possibility of reinstating the railway along the trail in the future has not been ruled out (refer paragraph 6.3.7.4 of the 2012 Report).

**Technical Appraisal**

6.13 It is considered technically feasible to find an alternative underground solution to replace the 4ZO.3/4 route that runs from the Woodhead tunnel in a westerly direction. There are significant technical challenges with this option and they are described in greater detail in the 'Long Term Future Study Draft Report 2012’, which is available on the VIP website.

6.14 In particular, there are significant width restrictions along the Longdendale Trail that would result in more specialist construction sequencing and methodology. The ground is of unknown consistency and composition and crosses numerous watercourses that flow into the reservoir. This could greatly increase the civil engineering earthworks required, with resulting localised environmental impacts.

6.15 Where the width of the trail allows, a standard trench arrangement may be adopted. Where space restrictions are necessary, utilising surface mounted cable troughs may be required.

**Overall Conclusion**

6.16 This section of the report has presented the option which seems to be the most feasible for addressing the visual impact of these existing adjoining subsections of National Grid overhead line in the Peak District National Park.

6.17 Option 4/5a is considered technically feasible and although a new SEC in Search Area A may have some localised adverse impacts this option offers significant mitigation of some of the very high impacts that 4ZO.3/4 have on the landscape and visual amenity of the Longdendale Valley.

6.18 It is proposed that, should the VIP Stakeholder Advisory Group recommend to National Grid that 4ZO.3/4 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 area. 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 the progression of this project under VIP.
## Appendix 1 - Summary of Potential Primary Consenting Requirements

<table>
<thead>
<tr>
<th>Consent</th>
<th>Option 4: Direct Burial Underground cables</th>
<th>Option 5a: Surface Mounted Cable Troughs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Consent Order (DCO) under the Planning Act 2008 (as amended)</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>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>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>
</tr>
<tr>
<td>‘Appropriate Assessment’ under Habitat Regulations 2010</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>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>
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</tbody>
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