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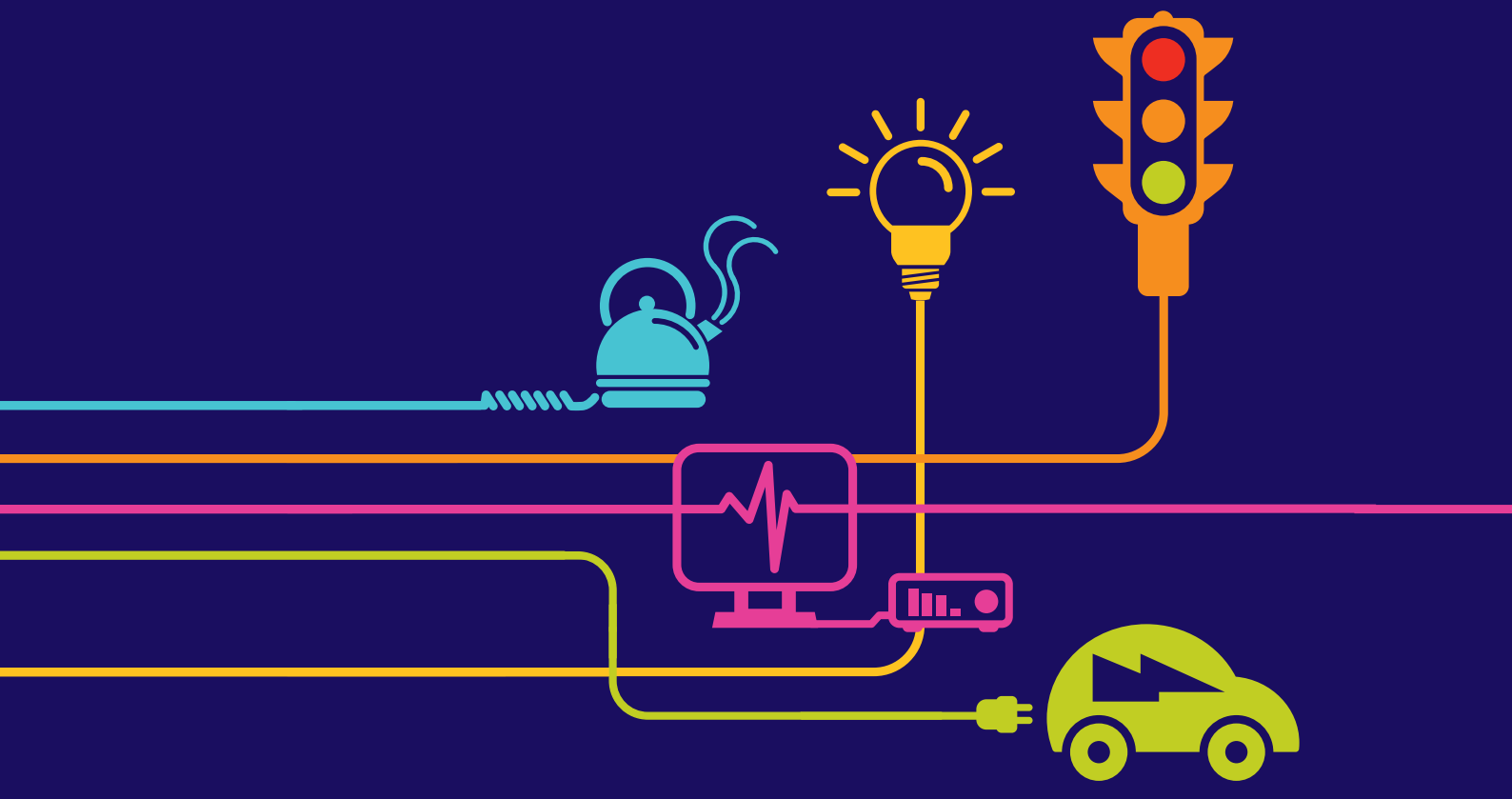
Environmental Statement Project Need and Alternatives Appendices 2N to 2P

Hinkley Point C Connection Project

Regulation 5(2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009



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May 2014

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Environmental Statement

Hinkley Point C Connection Project

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Appendix 2N – Hinkley Point C Connection Project Local Electricity Network Substation Siting Appraisal (2012)

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October 2012

Hinkley Point C Connection Project

Local Electricity Network Substation Siting Appraisal

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FIGURES

GLOSSARY

AEP	Annual Exceedance Probability
AIL	Abnormal Indivisible Load
AIS	Air Insulated Switchgear
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
BSP	Bulk Supply Point
EIA	Environmental Impact Assessment
FRA	Flood Risk Assessment
GIS	Gas Insulated Switchgear
GSP	Grid Supply Point
kV	Kilovolt (one thousand volts)
LNR	Local Nature Reserve
NSC	North Somerset Council
NPPF	National Planning Policy Framework
RCS	Route Corridor Study
SAC	Special Area of Conservation
SFRA	Strategic Flood Risk Assessment
SUDS	Sustainable Urban Drainage Systems
SGT	Super Grid Transformer
WPD	Western Power Distribution

1.0 INTRODUCTION

1.1 TEP was appointed by National Grid Electricity Transmission plc (National Grid) to undertake a high level environmental and planning appraisal to identify the least environmentally constrained zone for a new 400,000 volt (400kV)/132,000 volt (132kV) Grid Supply Point (GSP) substation within an Area of Search West of Nye Road in the Sandford area of North Somerset. The Area of Search was identified through a planning and environmental substation siting study[1] which is reported separately.

Background

1.2 The proposed 400/132kV GSP substation is required as a result of the removal of the existing 132kV F Route overhead line between Bridgwater and Avonmouth as part of the Hinkley Point C Connection project. The background to the project, the need for the substation and the alternatives considered are detailed in the following reports:

- Hinkley Point C Connection Project Strategic Optioneering Report (August 2011)[2];
- Hinkley Point C Connection Route Corridor Study[3] (RCS);
- Selection of Preferred Connection Report[4];
- Distribution System Options Report[5];
- Churchill/Sandford Grid Supply Point (GSP) Substation Siting Study[1] for Public Consultation; and
- Western Power Distribution 132kV Route Corridor Study[6] for Public Consultation.

Purpose of Study

1.3 This substation siting appraisal has been produced in response to the findings of the Churchill/Sandford GSP Substation Siting Study and the Consultation Feedback Report[7], to identify the least environmentally constrained zone within the Area of Search to the West of Nye Road to site a new 400kV/132kV GSP substation. A 132kV Bulk Supply Point (BSP) substation would be required adjacent to the National Grid 400kV substation which would be owned and operated by Western Power Distribution (WPD). This appraisal refers throughout to the siting of a GSP substation, which should also be assumed to include the adjacent 132kV BSP substation. The document has been prepared with the following objectives:

- To describe the high level environmental and planning constraints affecting the Area of Search West of Nye Road; and
- To assess the Area of Search in terms of these constraints and identify the least environmentally constrained zone in which to locate a new GSP substation.

[1] TEP: Churchill/Sandford Grid Supply Point Substation Siting Study for Public Consultation (May 2012)
[2] National Grid: Hinkley Point C Connection Project Strategic Optioneering Report (August 2011).
[3] TEP: Route Corridor Study for Public Consultation (October 2009).
[4] National Grid: Hinkley Point C Connection Project Selection of Preferred Connection Report (July 2011).
[5] National Grid and Western Power Distribution: Hinkley Point C Connection Project Distribution System Options Report (December 2011).
[6] TEP: Western Power Distribution 132kV Route Corridor Study for Public Consultation (May 2012)
[7] Hinkley Point C Connection Project – Local Electricity Distribution Network Project - Consultation Feedback Report - 6th June to 23rd July 2012

2.0 APPROACH AND METHOD

Study Assumptions

2.1 The Churchill/Sandford Substation GSP Siting Study provides an overview of general siting, design and layout parameters, based on information provided by National Grid and WPD on the GSP substation requirements. The Siting Study includes details on the following areas, most of which have been used as a basis for this siting appraisal and it should be referred to for further information.

- Technology (Air Insulation Switchgear (AIS) / Gas Insulation Switchgear (GIS);
- Dimensions;
- Topography;
- Flooding;
- Access;
- Drainage;
- Foundations;
- Electrical connections to the existing 400kV and 132kV networks;
- Landownership; and
- 'Brownfield' land and contamination.

Dimensions

2.2 For the purposes of this appraisal a substation size between approximately 150 - 230m wide and 200 – 240m long has been assumed.

2.3 The exact dimensions of the substation site would depend on a number of factors including the substation technology, site specific constraints that could affect layout and design, additional connections required, specification of equipment and landscaping requirements. Additional land may also be needed on a temporary basis for construction related requirements such as laydown areas.

2.4 Following completion of the Churchill/Sandford Substation GSP Siting Study additional information is now available with regard to the proposed substation access, and flooding.

Access

2.5 An Abnormal Load Movement Route Scoping Study has been undertaken on behalf of National Grid to assess the impacts of delivering transformers and other abnormal indivisible loads (AIL) to the Area of Search. The report identifies potential options for obtaining access into the Area of Search for construction. Further details are provided in Chapter 4 (Access).

2.6 As part of the Hinkley Point C Connection project, National Grid is proposing to construct 400kV underground cables through the Mendip Hills AONB which would terminate within the Area of Search at the proposed substation. An access road (and construction easement within which the cables would be routed) will be required from a new junction off the A368 to the Area of Search. Utilising the same access point for the proposed substation would remove the requirement to construct an additional access road.

Flooding

2.7 A Level 1 Flood Risk Assessment (Screening Study)[8] has been undertaken on behalf of National Grid to assess whether there are likely to be any flooding or surface water issues related to the proposed substation within the Area of Search West of Nye Road. Further details are provided in Chapter 4 (Water).

[8] South West Alliance (Jacobs): Level 1 Flood Risk Assessment (Screening Study). Proposed Development at land West of Nye Road, Sandford (August 2012)

Appraisal Method

2.8 The Churchill/Sandford Substation GSP Siting Study provides details on the approach and method adopted to identify potential substation sites. The siting study has been used as a basis for this siting appraisal and should be referred to for further information including:

- The main sources of information used to gather desk based information (i.e. primarily publicly available datasets);
- The factors that inform the assessment of environmental and planning feasibility;
- National Grid's statutory duties and guidance on substation siting (including the Horlock Rules); and
- Environmental features that National Grid seeks to avoid, or minimise effects on.

2.9 The appraisal of environmental constraints in the Area of Search West of Nye Road, and the identification of a least environmentally constrained zone has been informed by:

- The Churchill/Sandford Substation GSP Siting Study;
- Feedback from consultation with North Somerset Council (NSC), other key stakeholder agencies and the public. The Consultation Feedback Report summarises the key issues raised which include the substation size and design, noise, traffic, effects on landscape and views, the Mendip Hills AONB, bats and biodiversity, public footpaths and the Strawberry Line, proximity to settlements and existing buildings, and mitigation such as landscaping and maximising the use of natural topography. Further consultation carried out during the next stage may reveal issues that could not have been foreseen from this appraisal;
- Further studies undertaken on flood risk and access;
- National Grid and WPD guidance on the siting and routeing of infrastructure;
- The adopted development plan allocations for the Area of Search and emerging Local Development Framework;
- Environmental designations in the Area of Search;
- Other environmental and planning related matters that affect siting such as landscape character, flood risk and proximity to settlements;
- Visits to the Area of Search by TEP's landscape architects, planners and ecologists; and
- Initial feedback from ecological surveys being undertaken along the preferred route corridor for the Hinkley Point C Connection project. Site specific surveys carried out during the next stage may reveal issues that could not have been foreseen from this study.

3.0 THE AREA OF SEARCH

3.1 The Area of Search to the West of Nye Road (See Figure 2) was identified as the least environmentally constrained option in the Churchill/Sandford GSP Siting Study. It is beneath the existing F Route 132kV overhead line, north of Sandford, between Mead Land in the west and Nye Road in the east. The siting study identified three potential locations for the proposed substation within the Area of Search:

- Land adjacent to Nye Road, north of Droveway Farm;
- Land north of Mead Lane; and
- Land to the rear of the Thatcher's Cider factory.

3.2 For descriptive purposes the Area of Search is shown divided into these three areas. These areas are not considered in isolation and the least environmentally constrained zone could fall across more than one area. Land availability to the rear of Thatcher's Cider factory is constrained by residential properties and commercial buildings, and it would only be possible to accommodate a substation design with a small footprint in this area.

3.3 The Area of Search is within the administrative boundary of NSC. It is a rural area with a low-lying marshy landscape, typical of the Avon Moors that extend north of the Area of Search. Within the Moors landscape, roads tend to be narrow and are lined by hedges with ditches. Fields are damp, with relatively few mature trees in the boundary hedges.

3.4 The majority of the Area of Search between Mead Land and Nye Road comprises pasture fields (Agricultural Land Classification Grade 3/4) bounded by low clipped hedgerows with frequent scattered mature trees in hedgerows and within fields. More mature scrub and trees are present along larger drains and rhynes. In the north of the Area of Search the land lies between 6 - 9m AOD. This rises to between 16 – 21m AOD in the south of the area and to the rear of Thatcher's Cider factory.

3.5 Land immediately west of Nye Road is characterised by low agricultural buildings, with an area of recently planted trees adjacent. East of Nye Road clusters of agricultural buildings are present at Droveway Farm and Bridge Farm, as well as reservoirs and orchard associated with Thatcher's Cider factory.

3.6 A tree and scrub-lined dismantled railway line which forms part of a proposed Strategic Cycle Route runs through the Area of Search on land to the rear of Thatcher's Cider factory. A public right of way runs through the Area of Search across fields north of Mead Lane, and there are a number of other public rights of way and cycle routes in the immediate vicinity.

3.7 During initial consultation with NSC, it was recommended that the Area of Search should include land to the east of the dismantled railway line, to the rear of Thatcher's Cider factory. Some of this area is illustrated as woodland on the environmental constraints plan (Figure 3) and appears to have been recently replanted as orchard with young trees. Thatcher's Cider factory is south of the Area of Search at Sandford. A cluster of large sheds and several orchards are beyond the southern and eastern boundaries in this area.

3.8 The Strawberry Line Heritage Trail follows the dismantled railway line running through this area of North Somerset and forms part of a National Cycle Route. However the line is physically broken by the A368 at Sandford, and an 'on road' section of the trail runs east along the A368 and then north up Nye Road along the eastern edge of the Area of Search. An alternative permissive section of the Strawberry Line (agreed by Thatchers Cider Company Ltd) runs through the Area of Search on land to the rear of Thatcher's Cider factory. A diversion to this permissive stretch may be necessary for a substation in this area.

3.9 South of Thatcher's Cider factory the A368 runs from Banwell, through Sandford and east to Churchill and Lower Langford. This is an almost continuous ribbon of development, including houses, small manufacturing units, agricultural facilities and community buildings. South of the A368, the land rises steeply and slopes are wooded. These slopes are designated as part of the Mendip Hills Area of Outstanding Natural Beauty (AONB) and support a number of historic forts and Scheduled Monuments.

3.10 The closest properties to the Area of Search include those off Nye Road (e.g. Droveway Farm and Bridge Farm), properties off Mead Lane (including Mead Farm and West Leigh Farm) and properties close to Thatcher's Cider factory including Station Road Farm. Nye Hall is the closest property north of the Area of Search approximately 800m away.

3.11 WPD's F Route 132kV double circuit overhead line (proposed for removal as part of the Hinkley Point C Connection project) runs from Bridgwater to Portishead, and crosses over the north west of the Area of Search. WPD's N Route 132kV double circuit overhead line runs from the F Route 132kV overhead line in a north easterly direction to the existing Churchill 132kV substation, crossing over the south of the Area of Search including land to the rear of Thatcher's Cider factory. The N Route will need to be connected (turned in) to the new substation.

4.0 ENVIRONMENTAL CONSTRAINTS

Ecology

Ecological Designations

Cheddar Valley Railway Walk Local Nature Reserve (LNR)

4.1 The only ecological designation in the Area of Search is the Cheddar Valley Railway Walk LNR, which covers the majority of the Strawberry Line dismantled railway line running through this area of North Somerset. The LNR falls into part of the Area of Search to the rear of Thatcher's Cider factory and along Nye Road on the north eastern boundary. The interest of the site is primarily recreational rather than due to the rarity of flora and fauna.

4.2 Both stretches of the LNR could be avoided in substation siting so this is not a key determining factor in influencing the choice of specific site within the Area of Search. Depending on its exact size and orientation, a substation in land to the rear of Thatcher's Cider factory could be close to one of the stretches of the LNR. A greater extent of land is available to optimise the layout and positioning of a substation north of the dismantled railway line, where the distance from the other designated stretch of LNR could be greater.

Towerhead Brook Wildlife Site

4.3 Towerhead Brook Wildlife Site is approximately 150m west of the Area of Search at its closest point, and includes the watercourse and some adjacent fields, ditches and rhynes. Although outside the Area of Search, NSC has advised that a buffer zone of 5m should be maintained around all wildlife sites to retain their ecological value. The option of a new access road from the A368 would involve construction in the fields immediately east of the wildlife site, for which this would be an important consideration.

North Somerset and Mendip Bats Special Area of Conservation (SAC)

4.4 The Area of Search is within the 5km consultation zone which defines the feeding grounds for horseshoe bats associated with the North Somerset and Mendip Bats SAC. Within this zone proposals for change are subject to particular scrutiny for potential effects on the designated sites. At its closest point the Area of Search lies approximately 700m north east of the Banwell Ochre Caves Site of Special Scientific Interest (a component site of the SAC).

4.5 During bat surveys carried out in 2010 for the Hinkley Point C Connection project only one lesser horseshoe bat contact was recorded within the Area of Search during all of the ten transect survey visits. The results from the survey give high confidence that it is unlikely there would be significant adverse effects on bats, although an Appropriate Assessment is likely to be required following further surveys being undertaken.

4.6 Current habitat and bat survey information does not suggest a clear preference for siting within the Area of Search. A substation site and design that will minimise the footprint and the area of foraging habitat lost, whilst also avoiding or minimising the removal of hedgerows and trees would be beneficial.

4.7 Siting the substation within the northern end of the Area of Search, on land adjacent to Nye Road would maximise its distance from the Banwell Ochre Caves SSSI, which could minimise effects on bats using habitats closer to their roost for foraging and commuting. Land to the rear of Thatcher's Cider factory would be closest to the SAC and comprises two trees identified as having bat roosting potential. These would be an important consideration for substation siting in this area. Another tree identified as having potential for bat roosting is north of the dismantled railway line, on the boundary between land adjacent to Nye Road and north of Mead Lane, although its removal could be avoided.

4.8 A greater degree of hedgerow loss may occur from development in the area north of Mead Lane, due to the slightly smaller field sizes, compared with land adjacent to Nye Road and land to the rear of Thatchers Cider factory.

Ponds, ditches, hedgerows and trees

4.9 The majority of land within the Area of Search is improved pasture with some semi-improved pasture in the north eastern corner. Similar to hedgerows and trees a substation site and design that avoids or minimises the loss of water features such as ponds and ditches would be beneficial. Ponds and ditches in this area may offer suitable habitat for great crested newt, water vole and otter. Hedgerows may have the potential to support dormice.

4.10 It is not possible to completely avoid impacts on water features, hedgerows and trees with a substation site north of the dismantled railway line. Depending on the exact size and orientation of the substation a site on land adjacent to Nye Road may require the diversion of at least one ditch adjacent to a native species rich hedgerow. A site to the north of Mead Lane would result in a greater number of species poor hedgerows and trees being removed and could result in the loss of a pond. The majority of land to the rear of Thatcher's Cider factory is used for commercial orchard planting, although some mature tree removal may also be required.

4.11 Removal of part of a native species rich hedgerow along Mead Lane would be necessary to create a new access road from the A368 into the Area of Search.

Ecology Conclusion

4.12 Ecological designations can be avoided and are not key determining factors in influencing the choice of a specific site within the Area of Search. A site at the northern end of the Area of Search, on land adjacent to Nye Road would maximise the distance from the Banwell Ochre Caves SSSI, which could minimise effects on bats using habitats closer to their roost for foraging and commuting.

4.13 Potential ecological effects identified (e.g. hedgerow/tree loss, effects on water features) are common to most land within the Area of Search.

4.14 Current habitat and survey information does not suggest a clear preference for siting, with no significant distinguishing features to influence the choice of a specific location.

4.15 At this stage it is considered that adverse effects from substation construction can be either avoided or mitigated to an acceptable level. Appropriate mitigation for any site within the Area of Search is likely to include proposals to retain, replace or enhance connective habitat features for horseshoe bats associated with the North Somerset and Mendip Bats SAC.

Landscape and Views

Landscape Character

4.16 All of the Area of Search falls within local landscape character area River Yeo Rolling Valley Farmland (Area J2)[9], which is described as being a peaceful pastoral landscape with the presence of waterways signalled by lines of willows. The land contains scattered farmsteads and larger villages on higher land. This character is being eroded in places by ribbon development. Immediately north of the Area of Search the land falls into local landscape character area Locking and Banwell Moors (Area A4). The landscape is described as pastoral with a regular network of hedges, ditches and rhynes, numerous mature trees and sparse settlement creating a strong sense of remoteness and isolation. It

[9] North Somerset Council Landscape Character Assessment (2005)

notes that the character is influenced by marginal activities such as horse grazing, scrap yards and caravan parks.

4.17 The landscape is broadly consistent with the written descriptions of character although at a site specific level the character of the Area of Search is divided in two by the dismantled railway line.

4.18 Land to the north of the dismantled railway line is consistent with the published descriptions of a pastoral landscape with fields bound by low clipped hedgerows, with frequent scattered mature trees in hedgerows and within fields. More mature scrub and trees are present along larger drains and rhynes. Land immediately west of Nye Road is characterised by low agricultural buildings. Mature trees along a drainage ditch immediately north screen these buildings in views south from countryside to the north. The Mendip Hills form a backdrop to the Area of Search in these views. Built development is present as individual farmsteads or small groups of buildings often with mature trees and garden boundaries. There is a cluster of agricultural buildings at Droveway Farm and Bridge Farm as well as reservoirs, lagoons and orchards associated with Thatcher's Cider factory immediately east of Nye Road.

4.19 Land south of the dismantled railway line is characterised by open land with young recently planted orchard which forms part of Thatcher's Cider factory. Mature trees are present close to the factory buildings and along the dismantled railway line. Land east of the Area of Search and east of Nye Road is also characterised by orchards. This part of the Area of Search relates to the descriptions in the published character assessment of the character being eroded by ribbon development, such as large agricultural buildings associated with Thatcher's Cider factory.

4.20 The southern boundary of the Area of Search is approximately 400m from the Mendip Hills AONB. The Overarching National Policy Statement for Energy (EN1) states that consideration should be given to the purposes of nationally designated areas when siting development in close proximity to the boundaries of an AONB designation, and that 'the aim should be to avoid compromising the purposes of designation and such projects should be designed sensitively given the various siting, operational, and other relevant constraints'.

Views

4.21 The landscape of the Area of Search and its surroundings is relatively open with mature trees generally in hedgerows and along drains. Pockets of raised ground may allow views over relatively long distances and the substation may be visible from roads, footpaths and properties in the wider area. The southern boundary of the Area of Search is approximately 400m from the Mendip Hills AONB. A new substation would be visible from higher ground on the edge of the AONB such as Sandford Hill, Banwell Hill and Dolebury Warren.

4.22 Land adjacent to Nye Road is associated with agricultural buildings, and lagoons and reservoirs at Droveway Farm and Bridge Farm. Land to the rear of Thatcher's Cider factory is associated with large buildings and properties on Mead Lane, Station Road and Nye Road. A new substation associated with this existing built development would give rise to fewer landscape and visual effects than a substation beneath the existing line in land to the north of Mead Lane which is less associated with built development.

4.23 Land adjacent to Nye Road and north of Mead Lane is on slightly lower ground. This would make the substation less prominent in views from roads, footpaths and properties in the wider area compared with land to the rear of Thatcher's Cider factory which is on higher ground and is likely to be more noticeable. Land to the rear of Thatcher's Cider factory is also closer to properties along Mead Lane and Station Road and would give rise to more visual effects on residential properties which may be difficult to mitigate.

Landscape Character and Views Conclusion

4.24 Land to the rear of Thatcher's Cider factory is slightly more enclosed with blocks of mature trees often around larger buildings, which offer potential to incorporate mitigation screening in keeping with the local character. However there are more properties which back onto this land which would experience views of a new substation that would be difficult to mitigate. The land here is also higher than land in the north of the Area of Search, which would make the substation marginally more prominent in views from the wider area including the AONB.

4.25 Both land to the north of Mead Lane and adjacent to Nye Road are more open in character. Mature trees and scrub which could be used to aid screening are mostly along larger drainage ditches with some individual trees in hedgerows. However the land is lower and there are fewer properties, most of which have mature garden boundaries which would help to filter views towards a new substation.

4.26 Land adjacent to Nye Road has a drain with mature trees which, if retained, could be augmented to aid the screening of a new substation. This land also includes existing agricultural buildings, and is close to a number of other agricultural buildings at Droveway Farm and Bridge Farm with lagoons and reservoirs east of Nye Road. A new substation in this part of the Area of Search would give rise to fewer effects on landscape character than in land to the north of Mead Lane as it would be closer to and associated with this existing built development. It would also maximise distance from the AONB.

4.27 Fewer properties would experience views of a new substation on land adjacent to Nye Road than land north of Mead Lane or rear of Thatcher's Cider factory. However the land is close to Droveway Farm and Bridge Farm which would experience adverse views. A mature orchard on the opposite side of Nye Road to the north would provide some screening of the new substation in views from the east.

Historic Environment

4.28 There are no historic environment designations within the Area of Search.

Scheduled Monuments

4.29 The closest Scheduled Monument is a moated house (Nye Hall) adjacent to Nye Road, approximately 850m north of the Area of Search.

4.30 The distance between the Area of Search and the monument, and the existing screening that partially encloses the property should ensure adequate separation to avoid any significant adverse effects on its setting. This is therefore not considered a key determining factor in influencing the choice of specific site within the Area of Search. Potential effects on the setting of the monument would be taken into account as part of the Environmental Impact Assessment (EIA) and could be minimised through appropriate screen planting.

4.31 Effects on the setting of Banwell Camp Scheduled Monument (approximately 950m south west) and a deserted medieval farmstead south of Gout House Farm (approximately 1.2km north west) are not anticipated but would be taken into account as part of the EIA.

Listed Buildings

4.32 There are no Listed Buildings in the Area of Search. There are several Listed Buildings south of the Area of Search at Towerhead and Sandford, closest to land to the rear of Thatcher's Cider factory. Potential effects on the setting of the Listed Buildings would be taken into account as part of the EIA. However the presence of intervening tree screening, properties and agricultural/commercial buildings between the Area of Search and the Listed Buildings should negate the potential for significant adverse effects on their setting.

Non-designated Heritage Assets

4.33 The North Somerset Historic Environment Record identifies numerous non-designated heritage assets within the vicinity as shown on Figure 3. These are taken from a dataset originally collated as part of the Hinkley Point C Connection project Route Corridor Study, and show assets within 250m of the preferred route corridor. There is one record within the Area of Search and six records adjacent to its boundary as detailed in Table 4.1 below.

4.34 All non-designated heritage assets could be avoided in substation siting within the Area of Search. Table 4.1 highlights that potential effects on the setting of non-designated assets would be a common consideration for most areas of land within the Area of Search so there is no clear preference for siting. A substation in the north western corner of the Area of Search would maximise its distance from the assets and therefore minimise any potential effects on their setting in comparison to one in close proximity. Potential effects on the setting of non-designated assets would be taken into account in the EIA along with the requirement for mitigation including screen planting to minimise any effects.

Table 4.1: Non-designated heritage assets in the Area of Search and six records adjacent to its boundary

Drawing reference	Description	Location in relation to Area of Search
Within Area of Search		
199	Cheddar Valley & Yatton railway	Runs through Area of Search
Adjacent to Land to the rear of Thatcher's Cider factory		
397	Site of building 80m north east of Station farm	Close to southern boundary of land to the rear of Thatcher's Cider factory
453	Area of Medieval or Post-Medieval ridge and furrow	South west of Drove Way Cottages, adjacent to eastern boundary of land to rear of Thatcher's Cider factory
Adjacent to Land to north of Mead Lane		
396	Site of building 100m north east of Mead Farm	Adjacent to southern boundary of land to north of Mead Lane
Adjacent to Land adjacent to Nye Road		
366	Droveway Railway Bridge	Adjacent to eastern boundary of and adjacent to Nye Road
367	Site of infilled railway borrow pits	Bridge Farm, adjacent to eastern boundary of land adjacent to Nye Road
224	Post medieval farmstead at Droveway Farm.	Adjacent to eastern boundary of land adjacent to Nye Road

Archaeological Interest

4.35 There may be other unknown archaeological assets which could be affected during ground disturbance for substation construction. An assessment of the potential for archaeological remains and any direct or indirect effects from substation construction would be carried out as part of the EIA. Mitigation would depend on the findings of the archaeological assessment carried out in liaison with English Heritage. Negative effects on buried archaeological remains are due primarily to their loss of value in terms of their potential to contribute to people's understanding of the past (i.e. evidential value). This effect can be reduced, although not completely, through archaeological investigation and recording. However, because archaeological remains are a finite and non-renewable resource preservation *in situ* is preferred, where possible.

4.36 Historical information about the Winscombe and Sandford area was provided by the Winscombe and Sandford Archaeological Historical Project (WASP) during a public consultation event in June 2012. The information indicates that a number of field names in this area of Sandford may relate to an Anglo-Saxon farm site and a pre-existing Roman settlement.

Cultural Heritage/Archaeology Conclusion

4.37 The Scheduled Monument at Nye Hall and Listed Buildings south of the Area of Search are not considered key determining factors in influencing the choice of specific site within the Area of Search as significant adverse effects are not anticipated.

4.38 Potential effects on the setting of non-designated assets are common to most areas of land within the Area of Search so there is no clear preference for siting. A substation in the north western corner of the Area of Search would maximise distance from non-designated assets and therefore minimise any potential effects on their setting in comparison to one in close proximity. Significant adverse effects on non-designated assets from substation construction are however likely to be avoidable or capable of mitigation to an acceptable level, so these features are not a key influence in the choice of a specific site within the Area of Search.

Noise

4.39 National Grid and WPD recognise that their works may have an adverse effect on amenity. Horlock Rule 5 highlights the importance of keeping visual, noise and other environmental effects to a reasonably practicable minimum, with Note 5 to this rule referring to the need to consider adjoining uses and the amenity of local inhabitants.

4.40 There is potential for low frequency operational noise in the immediate vicinity of the substation. The Churchill/Sandford GSP Substation Siting Study considered potential noise effects on individual properties in the identification of potential substation sites by seeking to maintain separation between potential sites and properties, and to exploit existing or potential screening by woodland and other vegetation. Residential properties were identified from Ordnance Survey maps and during site visits.

4.41 Baseline noise surveys have not been undertaken in the Area of Search at this stage. Ambient noise levels in the land to the rear of Thatcher's Cider factory are likely to be marginally higher than in land north of Mead Lane and adjacent to Nye Road, due to its proximity to the A368 and Thatcher's Cider factory. A substation at this site would be closer to a greater number of residential properties (on Nye Road, Station Road and Mead Lane) than in the centre or north of the Area of Search, but orchards, trees and buildings may assist in providing a buffer to potential noise.

4.42 A site adjacent to Mead Lane would also be close to several properties, in comparison with a site adjacent to Nye Road, where there are just two properties close by on either side of Nye Road (Droveway Farm and Bridge Farm).

Noise Conclusion

4.43 A substation in the north west of the Area of Search would be the optimum position to minimise potential effects by maximising separation from residential properties that have the potential to be exposed to noise. The topography in the north is also lower than other parts of the Area of Search (between 7 - 9m AOD) which could assist in the attenuation of noise over distance compared with land on higher ground to the rear of Thatcher's Cider factory between 16 – 21m.

4.44 National Grid's Amenity Policy Commitment 5 commits to carrying out mitigation measures to reduce adverse effects as far as practicable. Potential effects and opportunities for

mitigation, if required, would be determined following a noise assessment as part of the EIA, but include noise attenuation measures such as the installation of noise enclosures and/or screen or acoustic planting.

Water

Flood Risk

Introduction

4.45 National Grid and WPD consider flood risk very carefully when siting installations such as substations. In accordance with the sequential approach outlined in the National Planning Policy Framework (NPPF) the Churchill/Sandford GSP Siting Study sought to identify potential substation sites that are outside Environment Agency Flood Zones 2 or 3. The Environment Agency flood mapping for the area is presented at Figure 3. The Area of Search to the West of Nye Road falls entirely within Flood Zone 1, with a low probability of flood risk described in the Technical Guidance to the NPPF as less frequent than the 0.1% annual exceedance probability (AEP) (1 in 1000 annual chance of occurring each year event) from fluvial and tidal sources, ignoring the presence of existing defences. The northern and western edge of the Area of Search is close to land in Flood Zones 2 and 3.

4.46 The development falls under the category 'essential infrastructure' as defined by Table 2 of the Technical Guidance to the NPPF. All developments in this category are considered appropriate within Flood Zone 1. As the Area of Search is in Flood Zone 1, neither the sequential test nor the exception test, as described in the Technical Guidance to the NPPF, need be carried out. However as the substation development will cover in excess of one hectare, a Flood Risk Assessment (FRA) will be required to accompany any application for consent.

Level 1 FRA (Screening Study)

4.47 A Level 1 FRA (Screening Study)[10] has been undertaken on behalf of National Grid to assess whether there are likely to be any flooding or surface water issues related to a substation within the Area of Search to the West of Nye Road.

4.48 The FRA Screening Study considers the Level 1 Strategic Flood Risk Assessment (SFRA) and Level 2 SFRA produced by NSC. The SFRA flood mapping takes account of a wide range of information and develops the Environment Agency flood risk map further. It also models climate change scenarios to 2108, to take account of increased fluvial flows and increased sea levels.

4.49 The NSC Level 1 SFRA mapping shows the outline of Flood Zone 3 covering a slightly larger area on the northern edge of the Area of Search compared to the Environment Agency mapping, which does not account for climate change. Approximately 5-10% of the northern extent of the Area of Search is shown as being an extension of Flood Zone 3 (climate change additional extents) on the SFRA Existing and Future Flood Risk map if climate change is taken into account (see Figure 5). The Screening Study therefore recommends that this mapping is considered in preference to the area of Flood Zone 3 shown on the Environment Agency mapping.

4.50 Policy CS3 of the North Somerset Core Strategy (2012) re-iterates how new development will need to be mindful of the increased risks of flooding as a result of climate change. It refers to the SFRA maps showing the 'climate change additional extents' and advises that 'for long term planning purposes, these areas – and any intervening zone 2 areas – will be treated as the equivalent of flood zone 3a unless there is evidence to the contrary. For

[10] South West Alliance (Jacobs): Level 1 Flood Risk Assessment (Screening Study). Proposed Development at land West of Nye Road, Sandford (August 2012)

development management purposes, the Environment Agency Flood Map extents will continue to apply'.

4.51 None of the Area of Search has been identified by the Environment Agency to be within a critical drainage area. There are no records of flooding (including groundwater flooding) or modelled/recorded flood levels in the Area of Search or its immediate vicinity to influence siting.

4.52 The topography of the Area of Search should be suited to gravity drainage, due to the general slope to the north across the site. The lower land in the north of the Area or Search which would receive any discharge may have high water levels during the winter months. The Screening Study advises that this would need to be reflected in the site drainage arrangements for a substation in this area.

4.53 The replacement of greenfield land with areas of hardstanding will increase the rate and volume of surface water runoff from the site. The FRA Screening Study concludes that mitigation measures for surface water runoff from the site should be adequate through the provision of suitable SUDS techniques.

Water Features

4.54 The proposed substation site should seek to avoid or minimise the loss of any water features in the Area of Search including several drainage ditches and ponds, which may offer suitable habitat for great crested newt, water vole and otter.

Wessex Water Pumping Main

4.55 During consultation on the preferred Area of Search for the substation Wessex Water advised that there is a pumping main that crosses land to the rear of Thatchers Cider factory. Consent may need to be sought from Wessex Water for the diversion of the pumping main, for a substation in this area.

Water Conclusion

4.56 If the substation is positioned anywhere in the Area of Search in Flood Zone 1 (taking into account the effects of climate change shown on the NSC Level 1 SFRA mapping and Figure 5), both fluvial and tidal flood risk is assessed as being low. The FRA Screening Study suggests a number of control measures for flooding that would be applicable to any site within the Area of Search.

4.57 The proposed substation should be sited within the Area of Search to avoid the area shown as an extension of Flood Zone 3 on the NSC Level 1 SFRA mapping (See Figure 5).

4.58 It may not be possible to completely avoid impacts on water features north of the dismantled railway line. A site on land adjacent to Nye Road may require the diversion of at least one ditch adjacent to a native species rich hedgerow. A site to the north of Mead Lane may result in the loss of a pond.

Access

Introduction

4.59 Permanent vehicular access will be required to the GSP substation site for the purpose of maintenance and repairs. The construction and operation of the substation will also require access for the delivery of large items of substation equipment known as abnormal indivisible loads (AILs), most notably the super grid transformers (SGTs) which would be carried on large low loading trailers. The AIL access must be available during construction and throughout the operational life of the GSP substation so that in the event of a transformer failure the route is available to deliver a replacement and remove the faulty transformer for repair.

4.60 An Abnormal Load Movement Route Scoping Study[11] has been undertaken on behalf of National Grid to assess the impacts of delivering transformers and other abnormal indivisible loads (AIL) to the Area of Search.

4.61 The report also identifies and considers the following potential options for obtaining access into the Area of Search.

Options discounted

Access via Nye Road

4.62 The junction between Nye Road and the A368 is too narrow to be accessed by a transformer transporter vehicle without carrying out significant engineering works. There is a garage with a 2m high stone retaining wall on one side of the junction and a 3m high stone boundary wall to a property on the opposite side. Extensive junction reconstruction would be required which could involve purchasing and demolishing the garage to facilitate access.

4.63 Beyond the junction, Nye Road remains narrow. It passes a number of properties followed by a hump-backed bridge over the Strawberry Line. To achieve access along the stretch of Nye Road between the junction with the A368 and the railway bridge several walls and hedges belonging to residential properties would need to be removed and land purchase is likely to be required. Due to the combination of issues at the junction, the narrow width of Nye Road, and the hump-backed railway bridge, Nye Road is not considered a viable option for a possible substation transformer transporter vehicle access. However it may be suitable for use as an operational access to a substation in the north of the Area of Search.

Access via Mead Lane

4.64 Mead Lane runs north from the A368 and along the south western boundary of the Area of Search, providing access for residential properties and adjoining agricultural land. Mead Lane is not considered a viable option for a possible substation transformer transporter vehicle access due to the narrow width of the existing road, its junction with the A368 and the potential requirement for land purchase from a number of residential properties.

Options Considered

Access via Thatcher's Cider Factory Premises

4.65 It appears feasible to obtain AIL access off the A368 through two entrances to Thatcher's Cider factory (one of which is an existing HGV entrance), with a minimum amount of engineering works to the junction. For either entrance from the A368 an AIL access road would need to be constructed in land to the rear of the cider factory which falls into the Area of Search.

4.66 The length of additional access road required in land to the rear of Thatcher's Cider factory would depend on the exact substation site but is likely to range between 50m and 800m. Utilising this existing access is likely to minimise the overall development footprint by providing a shorter route than one from a new junction off the A368 (see below), particularly to a substation to the rear of Thatcher's Cider factory and adjacent to Nye Road.

4.67 The access road would need to cross the proposed Strategic Cycle Route and a permissive route of the Strawberry Line Heritage Trail for a substation in land to the north of Mead Lane or west of Nye Road. Potential effects would require detailed consideration in consultation with NSC and the Strawberry Line Community Group. Land to the rear of

[11] South West Alliance (Jacob's) Hinkley Site Investigations Abnormal Load Movement Route Scoping – Further Investigations (August 2012)

Thatcher's Cider factory includes two trees identified as having bat roosting potential, and this would also need to be considered for an access road running north of the dismantled railway line.

4.68 The viability of this option and its suitability for AIL movements, construction and operational access would be dependent on agreement with Thatcher's Cider factory. The potential effects on the company and its operations would require detailed consideration.

Access via a new junction off the A368

4.69 This option involves forming a new junction off the A368 in the vicinity of the existing F Route 132kV overhead line crossing and opposite a haulage yard. A junction at this location is considered acceptable in terms of visibility requirements, but the full requirement for visibility, and the junction spacing distance required from the haulage yard access on the other side of the A368 would need to be agreed with the Local Highway Authority.

4.70 The length of the access road would depend on the exact location of the substation in the Area of Search but it is likely to be between 500m and 1km long. The access road would run approximately 150m west of residential properties along Mead Lane and would need to avoid the Towerhead Brook Wildlife Site to the west. This option would not require a crossing of the proposed Strategic Cycle Route and a permissive route of the Strawberry Line Heritage Trail. The construction of a new access road would increase the overall scale of development in this area and may introduce additional environmental effects outside of the Area of Search on the open countryside, ecology, archaeology, landscape and views from properties and the AONB. However, these effects are not considered to be so significant so as to make this option unacceptable.

4.71 As part of the Hinkley Point C Connection project, National Grid is proposing to construct 400kV underground cables through the Mendip Hills AONB which would terminate within the Area of Search at the proposed substation. These cables would exit the Mendip Hills through a natural gap in landform between Banwell Hill and Sandford Hill. An access road (and construction easement within which the cables would be routed) will be required from the A368 to the Area of Search. Utilising the same access point as required for the proposed substation would focus all development in one location and would remove the requirement to construct an additional access road through the cider factory.

<u>Access Conclusion</u>

4.72 Of the two options considered an access road from a new junction off the A368 would be more visually prominent from residential properties and would generally require a longer route which would increase the overall scale of development. An access to the rear of Thatcher's Cider factory would provide a shorter route into some parts of the Area of Search, particularly land to the rear of the factory and land west of Nye Road, but would need to cross the proposed Strategic Cycle Route and a permissive route of the Strawberry Line Heritage Trail.

4.73 However, an access road from a new junction off the A368 could also be used as an access road for the 400kV underground cable works, and a construction easement within which the cables would be routed. Using the same access point for the proposed substation would focus all development in one location and would remove the requirement to construct an additional access road through the cider factory.

5.0 CONCLUSION

Introduction

5.1 The Area of Search West of Nye Road was identified as the least environmentally constrained option in the Churchill/Sandford GSP Siting Study. This environmental and planning appraisal has been undertaken to identify the least environmentally constrained zone within this Area of Search within which the new 400kV/132kV GSP substation could be sited.

5.2 Some potential environmental effects and constraints (e.g. proximity to non-designated heritage assets, hedgerow/tree loss, development in the 5km consultation zone for the North Somerset and Mendip Bats SAC) are common across the Area of Search, or are not considered sufficiently significant to make them a differentiating factor in siting. The constraints and opportunities for other environmental factors (e.g. effects on landscape and views, noise and flood risk) differ across the Area of Search so professional judgement needs to be applied when making comparisons.

5.3 Land adjacent to Nye Road in the north east of the Area of Search has been identified as the least environmentally constrained zone for the substation (See Figure 5).

Ecology

5.4 Ecological designations in the Area of Search can be avoided and current ecological habitat and bat survey information does not suggest a clear preference for siting. Potential ecological effects identified (e.g. hedgerow/tree loss, effects on water features) are common to most land within the Area of Search. The location of the least environmentally constrained zone would however maximise the distance between the substation and the Banwell Ochre Caves SSSI, which could minimise effects on bats using habitats closer to their roost for foraging and commuting. A substation in the least environmentally constrained zone may require the diversion of a drain adjacent to a native species rich hedgerow.

Landscape and Views

5.5 A substation in the least environmentally constrained zone would maximise distance from the AONB and residential settlement at Sandford, and minimise the number of properties in close proximity. Although relatively close to Droveway Farm and Bridge Farm, comparatively fewer properties would experience views of a new substation than on land to the north of Mead Lane or rear of Thatcher's Cider Factory.

5.6 Land in the north of the Area of Search lies between 6m and 12m AOD compared to land in the vicinity of Mead Land and to the rear of Thatchers Cider factory which ranges between 8m and 20m AOD. Siting in the north of the Area of Search would allow the substation to be constructed in a natural dip in landform, which would reduce the effects on surrounding views compared with a substation on higher ground. Horlock Rule 4 states that '*the siting of substations, extensions and associated proposals should take advantage of the screening provided by landform and existing features, and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum*'.

5.7 Within the least environmentally constrained zone there are a number of low agricultural buildings. The landscape character is also influenced by buildings at Droveway Farm and large agricultural buildings, settlement lagoons and reservoirs associated with Thatcher's Cider factory at Bridge Farm. A substation that could be housed within a sensitively designed building to appear similar to other agricultural/industrial buildings in the area

would minimise effects on landscape and views, and may provide opportunities for ecological mitigation within the design.

5.8 A substation associated with this existing built development would give rise to fewer landscape and visual effects than a substation beneath the existing line in land to the north of Mead Lane which is less associated with built development. Depending on its exact size and orientation, a substation north of Mead Lane may also require the diversion of a public footpath.

5.9 A substation in the least environmentally constrained zone would be less prominent in views from the wider area than on land to the rear of Thatcher's Cider factory. Although land to the rear of the factory has a more industrial character and is partly enclosed by blocks of trees and large buildings, it is closer to a greater number of residential properties than a site in the north of the Area of Search and comprises higher ground. This would make the substation and associated overhead line connections marginally more prominent in views from the wider area, including the Mendip Hills AONB. A substation on land to the rear of Thatcher's Cider factory may also require a diversion to a permissive stretch of the Strawberry Line Heritage Trail.

Historic Environment

5.10 Scheduled Monuments and Listed Buildings in the wider area are not considered determining factors that influence the choice of a specific site within the Area of Search as significant adverse effects are not anticipated. Non-designated heritage assets are common to most areas of land in the Area of Search so there is no clear preference for siting. A substation in the least environmentally constrained zone would be close to Droveway Farm (a post-medieval farmstead), but any adverse effects are likely to be avoidable or capable of mitigation to an acceptable level.

Noise

5.11 A substation in the north of the Area of Search would be the optimum position to avoid potential effects by maximising separation from residential properties that have the potential to be exposed to noise. The topography in the north is also lower than other parts of the Area of Search, which could assist in the attenuation of noise over distance compared with land on higher ground. Although relatively close to Droveway Farm and Bridge Farm, there would be comparatively fewer properties close to a substation in the least environmentally constrained zone adjacent to Nye Road than on land to the north of Mead Lane or rear of Thatcher's Cider factory.

Access

5.12 A substation in the least environmentally constrained zone would require a longer access road from a new junction off the A368 than other parts of the Area of Search.

5.13 As part of the Hinkley Point C Connection project, National Grid is proposing to construct 400kV underground cables through the Mendip Hills AONB which would terminate within the Area of Search at the proposed substation. An access road (and construction easement within which the cables would be routed) will be required from a new junction off the A368 to the Area of Search. Utilising the same access point for the proposed substation would remove the requirement to construct an additional access road through the Thatcher's Cider factory, which would cross the proposed Strategic Cycle Route and a permissive route of the Strawberry Line Heritage Trail.

Water

5.14 The Area of Search to the West of Nye Road falls entirely within Environment Agency Flood Zone 1. The substation should be sited to avoid the area identified as an extension of Flood Zone 3 on the NSC Level 1 SFRA mapping (climate change additional extents) in the least environmentally constrained zone (See Figure 5).

5.15 Consent from Wessex Water may be required for the diversion of a pumping main for a substation on land to the rear of Thatcher's Cider factory.

Summary

5.16 Land adjacent to Nye Road in the north east of the Area of Search has been identified as the least environmentally constrained zone for the substation (see Figure 5). The substation should be sited to avoid the area identified as an extension of Flood Zone 3 on the NSC Level 1 SFRA mapping (climate change additional extents) in the least environmentally constrained zone.

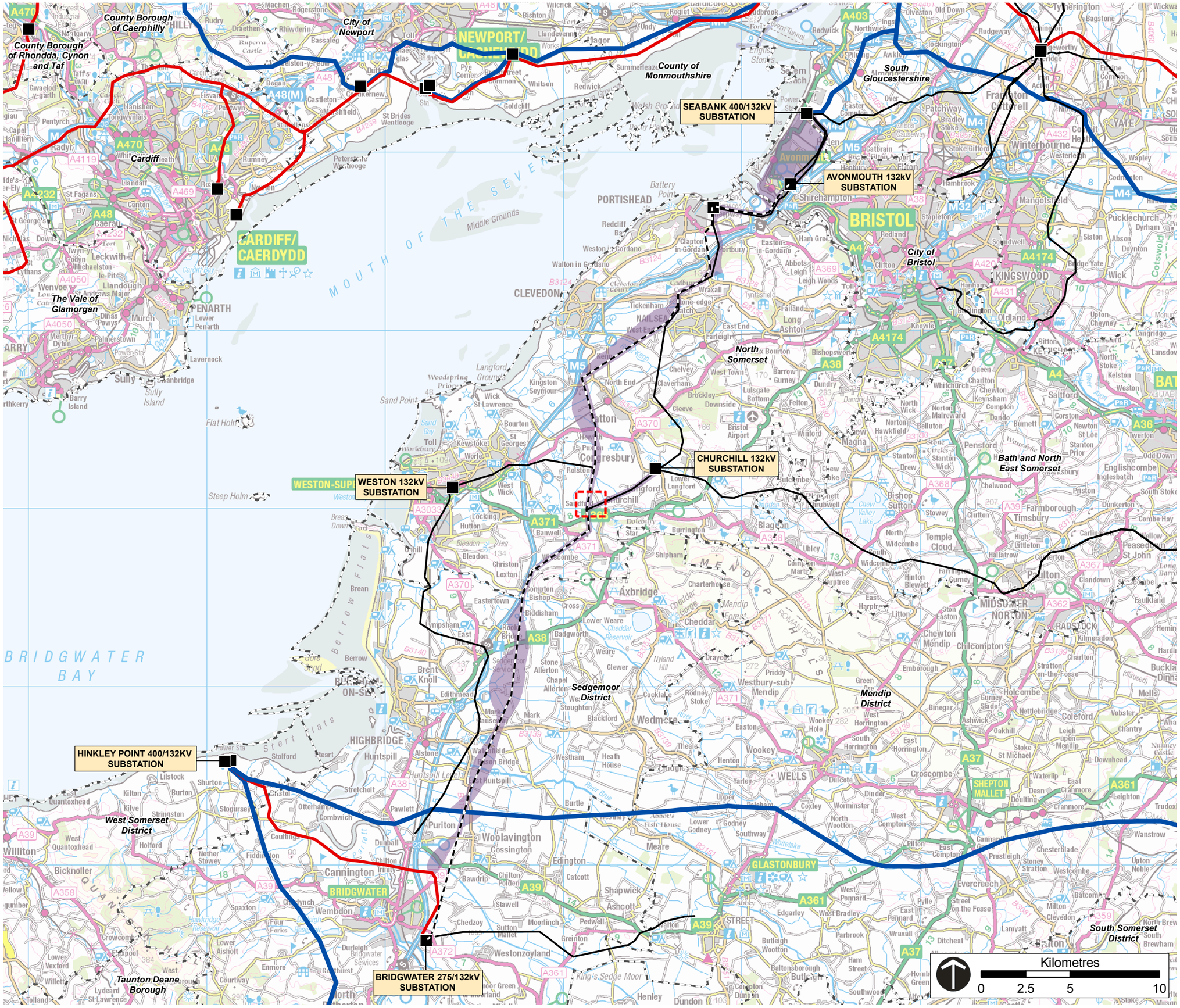
5.17 A substation in this zone would maximise its distance from the AONB and residential settlement at Sandford, and minimise the number of properties in close proximity. Siting in the northern part of the Area of Search would allow the substation to be constructed in a natural dip in landform which would reduce effects on landscape character, on surrounding views and could also assist in the attenuation of noise over distance compared with a substation on higher ground.

5.18 A substation design that will minimise the development footprint would be beneficial to avoid or minimise potential effects on landscape and views, ecology, water and buried archaeology. A substation housed within a sensitively designed building to appear similar to other agricultural/industrial buildings in the area would minimise effects on landscape and views, and may provide opportunities for ecological mitigation within the design.

5.19 A substation in the north of the Area of Search is likely to require a longer access road from the A368 than other areas, but would minimise the length of new 132kV connection required to the AT Route (to Weston-super-Mare)[12]. The potential landscape and visual effects of turning in (connecting) the proposed substation to the existing N Route 132kV overhead line would also need to be carefully considered during the substation design and as part of the EIA.

[12] TEP: Western Power Distribution 132kV Route Corridor Study for Public Consultation (May 2012)

Figure 1: Location Map



Key

Existing Infrastructure

- Existing Substation
- Existing 400kV Overhead Line
- Existing 275kV Overhead Line
- Existing WPD Overhead Line (On Lattice Steel Towers)
- Existing WPD Overhead Line to be Removed

Proposed Infrastructure

- Location of Area of Search for 400/132kV GSP Substation Site
- Hinkley C Connection Preferred Route Corridor

Local Authority Boundary

- Local Authority Boundary

Rev	Description	Dwn	Appvd	Date
A	Draft Removed	CB	LJ	16/10/2012

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Project:
Hinkley Point C Connection Project - West of Nye Road Substation Siting Appraisal

Title:
Figure 1 - Location Map

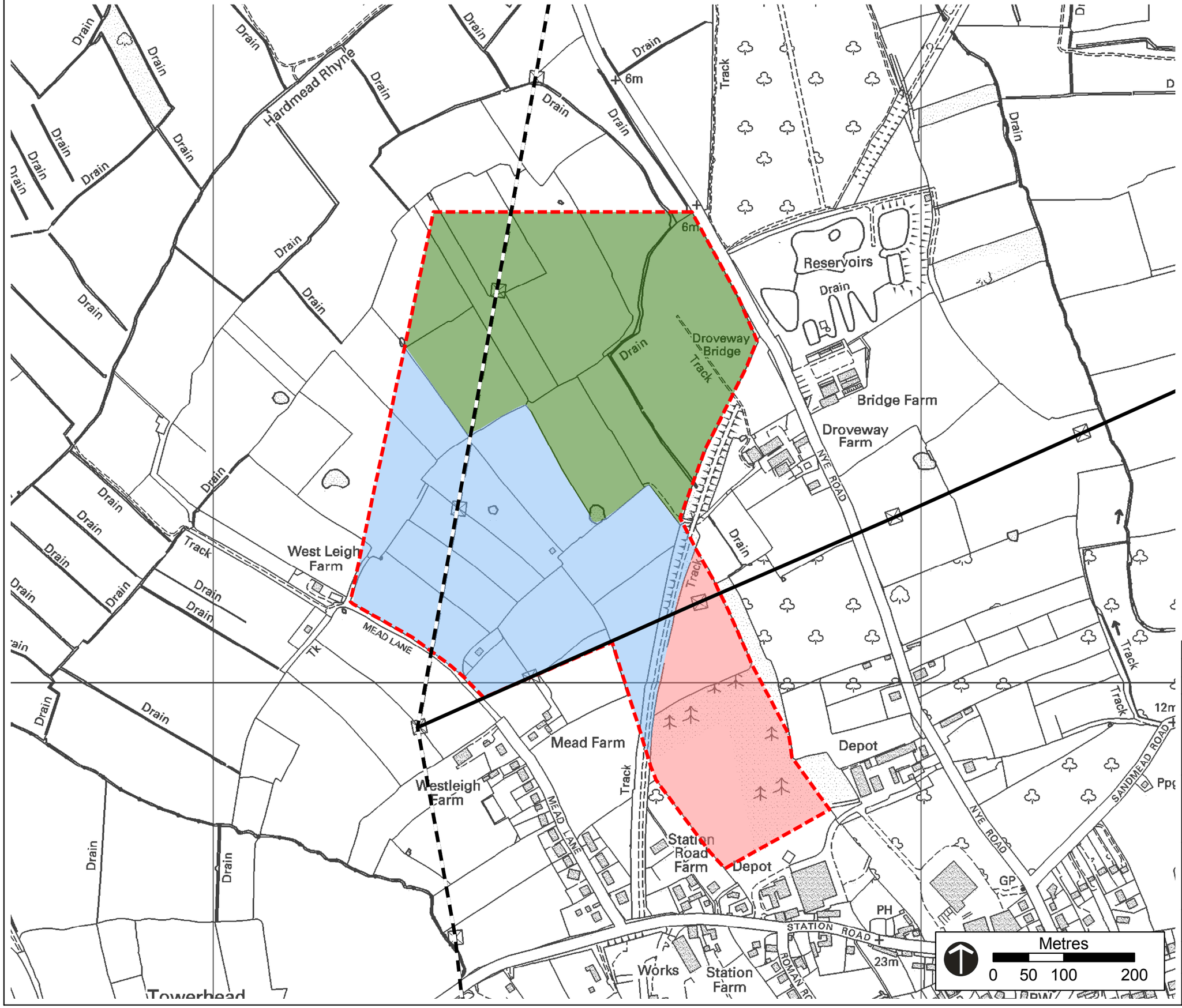
Map No.
G1979.03.082a

Scale:
1:200,000 @ A3

Date:
October 2012

Drawn:	Checked:	Approved:
CB	LJ	CC

Figure 2: Area of Search



Key

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing WPD Overhead Line to be Removed

Proposed Infrastructure

- Area of Search for 400/132kV GSP Substation Site
- Land adjacent to Nye Road
- Land North of Mead Lane
- Land to rear of Thatchers

Rev	Description	Dwn	Appvd	Date
A	Key change	CB	LJ	25/09/12
B	Draft Removed	CB	LJ	16/10/12

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West of Nye Road Substation Siting Appraisal

Title:
Figure 2 -
Area of Search for 400/132kV GSP Substation Site

Map No.
G1979.03.080b

Scale:	Date:
1:5,000 @ A3	October 2012

Drawn:	Checked:	Approved:
AJG	LJ	CC

Figure 3: Environmental Constraints

NOTE 1:

The following environmental constraints do not occur:
- World Heritage Site
- National Park
- Ramsar
- Special Protection Area
- National Nature Reserve
- Registered Battlefields
- Registered Park and Garden
- Heritage Coast
- Protected Wreck
- Airfield/Airport
- Public Safety Zone
- Housing and Open Space Allocation

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- National Grid
- Ordnance Survey
- Environment Agency
- Natural England - © Natural England [2011], reproduced with the permission of Natural England, http://www.naturalengland.org.uk/copyright/.
- English Heritage
- Local Constraints captured from North Somerset Replacement local plan (Adoted 2007)
- North Somerset District Council

F-ROUTE

N-ROUTE

F-ROUTE

277 449 395 276 438 267 357 366 367 224 368 370 358 396 453 397 218 188 194 205 219 220 172 384 338 177 195 206 187 173 189 184 799

Nye Drove Rhyne Nye Farm Rookery Farm Nye Drove Strawberry Line Sammead Rhyne Panel Farm Common Lane Droveway Bridge Droveway Farm Nye Road Green Hill Mead Farm Westleigh Farm Towerhead Towerhead Brook Eastmead Lane East Street Sandford

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Metres
0 100 200 400

Key

Existing Infrastructure
- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing WPD Overhead Line to be Removed

Proposed Infrastructure
- Area of Search for 400/132kV GSP Substation Site

Environmental Constraints
- Area of Outstanding Natural Beauty
- Special Area of Conservation
- Site of Special Scientific Interest
- Scheduled Monument
- Historic Buildings (Listed I, II* & II)
- Conservation Areas
- Local Nature Reserve
- Woodland
- Ancient Woodland
- Geological Site
- Local Wildlife Site / Site of Nature Conservation Interest
- Strategic Cycle Route
- Footpaths
- Flood Zones 2 & 3
- Settlements

Non-Designated Heritage Assets
These datasets were originally collated as part of a wider Hinkley to Seabank route corridor study. Non-Designated Heritage Assets shown upto 250m fromRoute Corridor Study Preferred Route Corridor.
- Non-Designated Heritage Asset (Point)
- Non-Designated Heritage Asset (line)
- Non-Designated Heritage Asset (Area)
- Non-Designated Heritage Asset Building (Point)
- Non-Designated Heritage Asset Building (Polygon)
- Palaeo-Environmental Evidence (Natural) (Point)

Rev	Description	Dwn	Appvd	Date
A	Draft Removed	CB	LJ	16/10/2012

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Hinkley Point C Connection Project - West of Nye Road Substation Siting Appraisal

Title:
Figure 3 - Environmental Constraints

Map No.: G1979.03.083a

Scale: 1:10,000 @ A3

Date: October 2012

Drawn: CB

Checked: LJ

Approved: CC

Figure 4: Topography

Key

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing WPD Overhead Line to be Removed

Proposed Infrastructure

- Area of Search for 400/132kV GSP Substation Site

Elevation in Metres

Above Ordnance Datum

- 1m Contour
- 4m - 5m
- 5m - 6m
- 6m - 7m
- 7m - 8m
- 8m - 9m
- 9m - 10m
- 10m - 11m
- 11m - 12m
- 12m - 13m
- 13m - 14m
- 14m - 15m
- 15m - 16m
- 16m - 17m
- 17m - 18m
- 18m - 19m
- 19m - 20m
- 20m - 21m
- 21m - 22m
- 22m - 23m
- 23m - 24m
- 24m - 25m
- 25m - 26m
- 26m - 27m
- 27m - 28m

Metres

0 50 100 200

Rev	Description	Dwn	Appvd	Date
A	Figure No. change	CB	LJ	25/09/2012
B	Removed Draft	CB	LJ	16/10/2012

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Project:

Hinkley Point C Connection Project - West of Nye Road Substation Siting Appraisal

Title:

Figure 4
Topography

Map No.: G1979.03.081b

Scale: 1:5,000 @ A3

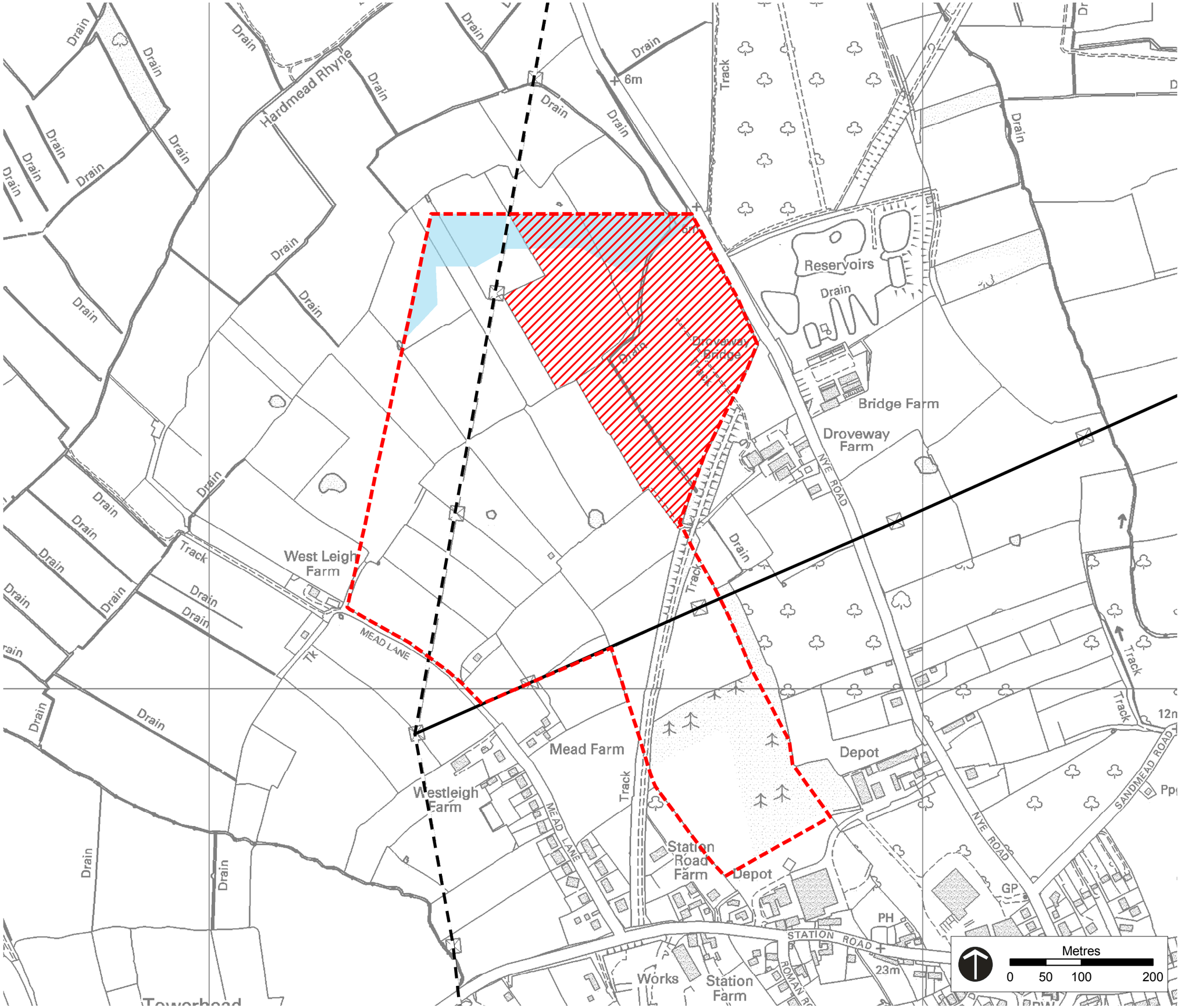
Date: October 2012

Drawn: CB

Checked: LJ

Approved: CC

Figure 5 - Least Environmentally Constrained Zone



Key

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing WPD Overhead Line to be Removed

Proposed Infrastructure

- Area of Search for 400/132kV GSP Substation Site
- Least Environmentally Constrained Zone
- North Somerset Council SFRA Climate Change Additional Extents

Metres
0 50 100 200

Rev	Description	Dwn	Appvd	Date
A	Draft Removed	CB	LJ	16/10/2012

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Project:
Hinkley Point C Connection Project - West of Nye Road Substation Siting Appraisal

Title:
Figure 5 - Least Environmentally Constrained Zone

Map No.: G1979.03.084a

Scale: 1:5,000 @ A3

Date: October 2012

Drawn: CB

Checked: LJ

Approved: CC

Appendix 2O – Western Power Distribution 132kV Route Corridor Study (2012)

MAY 2012

nationalgrid

Hinkley Point C Connection Project

Route Corridor Study

WESTERN POWER DISTRIBUTION 132KV
ROUTE CORRIDOR STUDY FOR PUBLIC CONSULTATION

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1.0 INTRODUCTION

1.1 This Route Corridor Study (RCS) has been produced by The Environment Partnership (TEP) for Western Power Distribution (WPD). The study focuses on a potential 132,000 volt (132kV) double circuit connection between a proposed 400/132kV Grid Supply Point (GSP) substation in the vicinity of Sandford, North Somerset and the existing 132kV overhead line known as the AT Route. The connection could be made at any point on this route between Weston-super-Mare and Weston 'tee'. The study area is illustrated on Figure 1.

Background

The Required Connection

1.2 In September 2007, National Grid received an application from British Energy Generation Limited (now part of EDF Energy) for the connection of a new nuclear power station at Hinkley Point, Somerset (Hinkley Point C) to the national grid high voltage electricity transmission system. In response National Grid identified the need for the construction of a new 400kV connection between Bridgwater, Somerset and Seabank, Bristol.

Route Corridor Study

1.3 A RCS was produced by TEP (on behalf of National Grid Electricity Transmission Plc) which identified two principal corridors and offered a comparison of them.

- **Corridor 1** is an 'opportunity corridor' which would follow the route of an existing Western Power Distribution (WPD) 132kV overhead line which travels from Bridgwater via Portishead to Seabank. Two options were identified within this corridor: Corridor 1 Option 1A would involve the removing the existing WPD 132kV overhead line and using its corridor for a 400kV overhead line; Corridor 1 Option 1B would involve constructing a new 400kV overhead line parallel to the existing 132kV overhead line. Under Option 1B the existing line would not be removed.
- **Corridor 2** would involve the construction of a new 400kV overhead line between Bridgwater and Seabank separate, as far as possible, from the existing overhead lines. In the area of Corridor 2 between the Mendip Hills and Yatton, three potential options were identified - the western, central and eastern spurs.

1.4 The RCS (which formed the basis of an extensive consultation exercise between October 2009 and July 2010) concluded that Corridor 1 Option 1A was the least environmentally constrained corridor as it would result in the replacement of an existing overhead line with a higher voltage overhead line. The relatively wide corridor identified for much of the route would also allow an alignment to be identified to minimise the scale of change and effects on the environment. The RCS is separately reported[1].

Preferred Route Corridor

1.5 National Grid's Selection of Preferred Connection Report[2] considers the relative merits of each of the potential route corridors against a range of factors. The report concludes that Corridor 1 Option 1A should form the basis for developing an overhead line connection between Bridgwater and Seabank.

1.6 Selecting Corridor 1 Option 1A as the basis of the connection means that the existing WPD 132kV overhead line between Bridgwater and Avonmouth substations will be removed and its corridor used for a new 400kV overhead line. The removal of the F Route overhead line would result in the loss of electrical supplies to existing substations at Weston-super-Mare and Churchill. As a result additional works are required to ensure security of supply on WPD's network.

[1] TEP: Route Corridor Study for Public Consultation (October 2009).
[2] National Grid: Hinkley Point C Connection Project Selection of Preferred Connection Report (July 2011).

Distribution System Options Report

1.7 Following the identification of National Grid's preferred route corridor a Distribution System Options Report[3] was produced by National Grid and WPD to consider the various options for maintaining supplies to the local distribution network. The Report concluded that an option which incorporates a new 400/132kV GSP substation in the Churchill/Sandford area best meets the range of technical, economic and environmental criteria and should be taken forward for further investigation. The Report proposed that detailed studies should be undertaken to identify potential locations for a new 400/132kV GSP substation in the area between Sandford and Churchill, but focussed close to the corridor of the proposed 400kV connection to minimise the amount of additional infrastructure required.

400/132kV Substation Siting Study

1.8 In response to the findings of the Distribution System Options Report a substation siting study was produced by TEP on behalf of National Grid and WPD to identify options for siting the 400/132kV GSP substation in the Churchill/Sandford area of North Somerset. This Study concludes that a new 400/132kV GSP substation in the area of search to the West of Nye Road in the vicinity of Sandford represents the least environmentally constrained option primarily because it would minimise the extent of new 400kV connections and infrastructure required. The substation siting study is separately reported[4].

Purpose of Study

1.9 This RCS has been produced in response to the findings of the 400/132kV GSP substation siting study detailed at paragraph 1.8 above and has been prepared with the following objectives:

- To examine potential route corridors for making a 132kV connection between a new 400/132kV GSP substation in the vicinity of Sandford and the existing 132kV AT Route overhead line;
- To describe the high level environmental and planning constraints affecting the choice of options; and
- To assess the options in terms of these constraints and identify the least environmentally constrained option.

1.10 The study has been undertaken primarily using publicly available datasets. Some of the publicly available datasets used (notably Conservation Areas and public footpaths) are not mapped with the precision that would be needed if WPD proceeded with an application for consent. The report does not provide detailed designs or costs in respect of any option.

Process to application for consent

1.11 The construction of a new 132kV overhead line is classified as a nationally significant infrastructure project (NSIP) under the Planning Act 2008. It is anticipated that the 132kV connections, consequent on the new 400/132kV GSP substation in the vicinity of Sandford, will be promoted through the Planning Act 2008 regime.

[3] National Grid and Western Power Distribution: Hinkley Point C Connection Project Distribution System Options Report (December 2011).
[4] TEP: Hinkley Point C Connection Project Churchill/Sandford Grid Supply Point Substation Siting Study (March 2012).

1.12 Following determination of the preferred route corridor for the 132kV connection further detailed assessment would be carried out as part of the Environmental Impact Assessment (EIA) for the overall Hinkley Point C connection scheme. The Environmental Statement will form an important part of the application to the Infrastructure Planning Commission's (IPC) successor (the Planning Inspectorate) and the information within this study will help inform this next stage of detailed assessment.

1.13 Under the Planning Act (2008) the IPC (or its successor) must take into account the relevant National Policy Statements in its consideration of the scheme. The National Policy Statements were adopted by parliament in July 2011 and set out the national need for particular types of development. Those of relevance to this project are:

- Overarching National Policy Statement for Energy (EN1); and
- Electricity Networks (EN5).

1.14 Following consultations on the route corridors, a review of representations received will be undertaken. A consultation Feedback Report and a Statement of Preferred Connection will be prepared which summarise the responses received, considers the representations made and explains actions which have been taken. It will confirm the preferred route corridor to be taken forward to the EIA stage where a detailed connection design will be considered and consulted upon.

Statutory Consultees and Local Planning Authorities Consultation

1.15 Following production of the Draft Substation Siting Study and Route Corridor Study (March 2012) National Grid and WPD consulted with the local planning authority and key stakeholder agencies to obtain technical feedback and guidance on the draft report. The following organisations were consulted:

- North Somerset Council;
- Natural England;
- English Heritage; and
- Environment Agency.

1.16 Officers from the above organisations were invited to attend a workshop event during April 2012 at which the need for the development and the method and findings of the draft reports were presented and key issues discussed. Attendees and those that were invited but were unable to attend were provided with copies of the draft reports and asked to provide technical feedback on the work done to date. The items raised and responses to these have been grouped by theme and are set out in a table presented at Appendix 3 of this report. The comments received are officers' technical and initial responses and do not form an official response or view of any of the organisations or planning authorities on the options considered.

2.0 DEFINITIONS AND STUDY ASSUMPTIONS

2.1 The purpose of this RCS is to identify potential route corridors within which an overhead line could be routed.

Definitions

2.2 The following definitions have been used in considering connections:

Connection Point

2.3 A place on part of the existing or proposed electricity distribution system where there is an existing connection or to which a new electrical connection is proposed.

Study Area

2.4 A geographic area containing one or more connection points.

Constraint

2.5 An influence on routeing overhead lines.

Overhead Line

2.6 One or more electricity distribution circuits suspended from above ground supports. Typically refers to conductors suspended from steel lattice towers (pylons) or wood poles.

Cable Sealing End

2.7 Structures used to transfer distribution circuits between underground cables and overhead lines.

Route Corridor

2.8 A defined linear shape identified on a map which may be of variable width and whose extent at any point is typically defined by constraints or differentiation from other route corridors.

Alignment

2.9 The actual route of an existing overhead line or a proposed detailed route for an overhead line associated with a route corridor. A route corridor may contain a number of possible alignment options.

Option

2.10 A means of making a connection which applies to a route corridor. A route corridor may have more than one option which applies. For example, a distribution circuit may be installed by the option of underground cables or overhead line. A 132kV route corridor based on the route of a 33kV or 66kV existing line may have the option of a new overhead line built parallel to it or of a new 132kV overhead line built along its route with the existing line removed.

Zone of Investigation

2.11 A geographic area which is of variable width. This area sub-divides the study area (typically by constraints) to allow further study and route corridors to be identified.

Study Assumptions

Overhead or Underground Transmission

2.12 WPD's electricity distribution network includes both overhead and underground lines. There is approximately 28,300km of overhead lines and 21,700km of underground cables.

2.13 WPD's Schedule 9 Statement states that it will:

> '*Continually work with partners to selectively underground lines in appropriate sensitive locations to improve the appearance of countryside, towns or villages, whilst taking account of sites of particular archaeological or nature conservation interest'*

2.14 There are no nationally or internationally designated sites which would be directly affected by the proposed corridors. Therefore consideration of the use of underground cables relates to effects on visual amenity and views from properties.

2.15 Information relating to the environmental constraints or benefits of utilising underground cables is stated in relation to the corridors where relevant. Detailed consideration of undergrounding will occur when considering alignments within route corridors.

Overhead Line Design

2.16 There are two overhead options which could be used for the 132kV connection: two 132kV trident wood pole lines; or one double circuit 132kV connection on steel lattice towers. The two options are described below and illustrated at Figure 2.

132kV Trident Wood Pole Lines

2.17 These structures are of a slightly different and larger design to the existing 33kV structures which are present within the landscape. They are approximately 4m taller at a height of 14m (typical average height). The span of the structures is approximately 130m which is similar to the span of existing 33kV lines suspended from poles.

2.18 Two overhead lines would be required if a connection via wood poles was to be used. These could either be parallel to each other or could use more than one corridor in order to make the connection.

132kV Double Circuit Tower Line

2.19 A double circuit 132kV overhead line would use steel lattice towers approximately 26m high (typical standard height) and would resemble the design and appearance of existing 132kV overhead lines and towers within the landscape (F Route and N Route). The span between each tower would be approximately 285m which would be longer and result in less line support structures than would be necessary for the wood pole lines.

2.20 Where an overhead line changes direction and where lines terminate at substations, stronger towers are required which have heavier steelwork and larger footprints than the standard towers. Taller towers than the standard height may be required in some locations and these may have extensions and may require larger footprints. Longer and shorter spans are likely to be needed in some locations, with longer spans often required to span potential obstacles. Where this is required shorter spans are needed either side of the longer spans.

Use of Lower Voltage Line Routes

2.21 Where there is an existing overhead line route running for part or the entirety of a possible route corridor, it has been assumed that it may be possible for a new higher voltage overhead line to use part or all of that route, subject to detailed survey. Detailed survey would demonstrate whether there are appropriate safety clearances from adjacent structures for the higher voltage line and if there are other technical or severe amenity constraints which would be incurred. These constraints may result in adjustments to the existing route to make it appropriate for the higher voltage line or discounting the use of that route as unsuitable for the higher voltage line.

2.22 Where there is the possibility to use the route of an existing overhead line, it is assumed that options may include building the new 132kV overhead line parallel to the existing line and leave the existing line in place; or building the new 132kV line and removing the existing overhead line.

2.23 Information on the feasibility of utilising existing lower voltage overhead line routes as corridors and the consequent requirements for actions to maintain distribution supplies is stated in relation to the corridors where relevant.

3.0 APPROACH AND METHOD

3.1 This Chapter presents the approach and method followed for the RCS which is one part of the overall process of preparing the application for consent.

3.2 The study has been undertaken primarily using desk-based information and site visits by TEP's specialists in landscape and town and country planning. The main sources of information used include:

- 'Shape files' from sources of environmental information as presented in Table 5.1;
- Google Earth web-based aerial imagery;
- Ordnance Survey Explorer 1:25,000 and Landranger 1:50,000 mapping;
- North Somerset Local Development Framework and Core Strategy and North Somerset Local Plan (sourced from the internet and hard copies of documents where these were available);
- Published reports on landscape character assessment; and
- Landform information derived from Ordnance Survey digital terrain modelling.

Routeing Constraints

3.3 Initially a review of WPD's guidance and policies on infrastructure siting and routeing was carried out. This guidance has been in use and has evolved with experience over many years.

3.4 A review of key elements of planning policy was undertaken to identify important aspects that may influence siting and routeing of infrastructure but which was not represented in WPD's guidance.

3.5 These reviews identified potential constraints and influences on siting and routeing infrastructure including statutory and planning designations. These were collated and analysed from desk study and also considered in site visits.

Landform (Topography and Physiography)

3.6 The Holford Rules (see paragraphs 4.7 – 4.8 below) refer to aspects of topography and physiography such as hills, ridges, dips, open valleys and flat land in considering overhead line routeing. For example, the Rules advise on exploiting the 'backgrounding' effect of high land and seeking to avoid ridges.

3.7 Landform has been considered in identifying route corridors by interpreting contour and spot height information on Ordnance Survey mapping. In addition, visualisations of levels and slopes have been prepared in computer software based on Ordnance Survey digital terrain model height information at 10m intervals.

3.8 This information has been used to consider the opportunities for potential route corridors that may produce alignments that comply with the Holford Rules and which have potential to minimise adverse effects on the landscape.

Landscape Character

3.9 There are designations relating to protection of the landscape that include reference to character, although character is not the only factor considered in designation. Reference is made to these designations in the review of WPD's policy and guidance (see Chapters 4.0 and 5.0 below).

3.10 Prior to the reform of the planning system introduced in the Planning and Compulsory Purchase Act 2004, local planning authorities identified areas of high relative landscape

value within their administrative districts in designations such as 'Area of Special Landscape Value' and 'Special Landscape Area'. These were development plan designations in which restrictions on development applied.

3.11 National planning policy guidance issued in the National Planning Policy Framework notes that, whilst it is accepted that there are areas of landscape outside nationally designated areas that are particularly highly valued locally, criteria-based policies can provide sufficient protection for these areas, without the need for rigid local designations. Landscape character assessment can provide the basis for such policies.

3.12 This guidance places emphasis on landscape character assessment as a tool for guiding policy. Landscape character assessments generally identify areas of landscape of a similar character and describe that character referring to aspects and features which, alone or in combination, make it distinct. Assessments typically refer to types of development or activity to which a landscape may be particularly sensitive.

3.13 Landscape character assessments are undertaken and reported at a range of scales, usually to support land use planning at different scales. There are landscape character assessments in England undertaken at national, regional, county and district levels, although coverage at levels below national is not comprehensive. Landscape character assessments also identify aspects of land management not usually covered by land use planning which affect character, such as treatments of hedgerows, walls and fences and agricultural practices.

3.14 In identifying potential route corridors, reference has been made to available landscape character assessments which have been presented on maps. The descriptions of landscape character and sensitivity of landscape have been used to assist in identifying potential route corridors. It is acknowledged that a new 132kV overhead line would give rise to landscape effects. Underground cables would give rise to temporary effects during and immediately following construction, however once land has re-established landscape effects are typically lower than an overhead line. Landscape character assessments can indicate which landscape character areas have greatest ability to assimilate these effects and which may be most sensitive.

3.15 Landscape character has also been considered on site visits, with photographs and notes recording aspects of landscape character and views in the study area.

'Opportunity Corridors'

3.16 The primary basis on which route corridors have been identified are the constraints, considered with landform and landscape character. However where there are existing overhead lines whose routes, completely or in part, have potential to be used for new overhead lines which would make the required connection, these have also been identified. For example an existing 33kV or 66kV overhead line may run on a route which a new 132kV overhead line may be able to take between connection points. These existing routes may affect features identified as constraints to new route corridors, although the scale of change from the existing situation by installing a new line in addition to or replacing the existing line may be lower than a new line in a situation where no line presently exists.

3.17 There are two existing 33kV overhead lines within the study area that run in an east - west direction (see Figure 3). The routes of these existing lines are not suitable for the required connection and therefore there are no 'opportunity corridors' that could be utilised within the study area.

Comparison of Route Corridors

3.18 Once route corridors and any different connection options within corridors have been identified, they have been compared using judgement applied to their performance against identified constraints, landscape character and landform.

3.19 Identification of the least environmentally constrained route corridor and option has been presented as the completion of this RCS.

4.0 WESTERN POWER DISTRIBUTION'S ENVIRONMENTAL GUIDANCE

4.1 This Chapter considers WPD's guidance relevant to identifying route corridors.

4.2 WPD refers to guidance notes on siting infrastructure when considering options for connections and changes to its network.

Statutory Duties

4.3 WPD has the following statutory duties (under the Electricity Act 1989) which apply to its operation of the distribution system:

- **Section 9**: to *'develop and maintain an efficient, co-ordinated and economical system of electricity distribution'*; and

- **Section 38 (Schedule 9)**: when formulating proposals to have regard to the *'desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest';* and *'to do what it reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects'.*

WPD's Schedule 9 Statement

4.4 As outlined above, WPD has a two-fold duty placed on it under Schedule 9 of the Electricity Act 1989 when installing electricity lines (overhead and underground). There is also an obligation for WPD to publish a statement presenting how it will comply with this duty.

4.5 WPD's Schedule 9 Statement (see Appendix 1) sets out the commitments under which it takes action to address the obligations under Schedule 9 of the Electricity Act 1989. WPD aims to:

- Minimise the impact of its activities on communities and the historic and natural environment;
- Site overhead lines with care and consider both the visual impact and the impact on nature conservation as far as possible; and
- Continually work with partners to selectively underground lines in appropriate sensitive locations to improve the appearance of countryside, towns or villages, whilst taking account of sites of particular archaeological or nature conservation interest.

4.6 The statement goes onto to describe how WPD will do this. Those of relevance to this study are listed below:

- Only building lines along new routes, or substations in new locations where the existing distribution system infrastructure cannot be economically upgraded;
- Will seek to avoid, where reasonably practicable, installation of new infrastructure in areas which are nationally or internationally designated for their wildlife, historic or cultural significance. This includes National Parks, Areas of Outstanding Natural Beauty, Sites of Special Scientific Interest; Special Protection Areas; Special Areas of Conservation; Ramsar Sites, National Nature Reserves; Heritage Coasts; World Heritage Sites; Scheduled Monuments and designated sites of historic interest (listed sites). If installation is necessary on such listed sites WPD will seek to avoid significant impacts on regional and local sites, protected species and to biodiversity and geological interest within the wider environment and take measures to safeguard historic sites. Where reasonably practicable, opportunities to enhance biodiversity and geological features on sites will be explored;
- Maintain a geographic record of the locations of the above listed sites;

- Seek specialist advice if it is necessary to undertake works on sites of archaeological, historical, biodiversity or geological interest, working closely with suitably qualified and experienced specialists;
- Will consult with District Councils for all new overhead lines. Where these involve voltages at 33kV and above WPD will voluntarily consult with Parish Councils. For 132kV overhead lines, WPD will in addition to consulting Parish Councils, consult County Councils;
- Will consult Local Authorities on the need to undertake an environmental impact assessment when it is proposed to build more than 1km of new overhead line of 33kV and above; and
- Will consult with statutory bodies, local authorities and relevant land owners where planned new construction would have a high amenity impact, to help identify, assess and carry out measures to mitigate the impact so far as is reasonably practicable.

The Holford Rules

4.7 In addition to the above guidance on siting all infrastructure, specific guidance on routeing overhead lines is provided by the 'Holford Rules', presented in Appendix 2. This guidance is primarily related to minimising effects on landscape and includes 'rules', explanatory and supplementary notes. National Policy Statement EN5[5] highlights that the guidelines should be followed by developers when designing their proposals. The key 7 rules on minimising landscape effects in routeing overhead lines are presented below:

1. **Avoid altogether, if possible, the major areas of highest amenity value.** (An explanatory note states that these designations include Areas of Outstanding Natural Beauty, National Parks, Heritage Coasts and World Heritage Sites.)
2. **Avoid smaller areas of high amenity value or scientific interest by deviation where this can be done without using too many angle towers** (An explanatory note explains that Sites of Special Scientific Interest may require special consideration for effects on ecology. A further explanatory note states that where possible routes should be chosen which minimise effects on the settings of areas of architectural, historic and archaeological interest including Conservation Areas, Listed Buildings, Listed Parks and Gardens and Ancient Monuments.)
3. **Other things being equal, choose the most direct line, with no sharp changes of direction to minimise use of angle towers.**
4. **Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible**; **and where the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where there is no dip in the ridge, cross directly, preferably between belts of trees.**
5. **Prefer moderately open valleys with woods where the apparent height of towers will be reduced and views of the line will be broken by trees.**
6. **Where land is flat and sparsely planted, keep high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, to avoid 'wirescape'.**
7. **Approach urban areas through industrial zones, where they exist. When pleasant residential and recreational land intervenes between the approach line and the substation, consider carefully the comparative costs of undergrounding, for lines other than those of the highest voltage.**

4.8 The Supplementary Note to Rule 5 refers to the desirability of avoiding vegetation including woodlands. A Supplementary Note to Rule 7 states that alignments should be chosen after consideration of effects on the amenity of existing development and on proposals for new development. A further general Supplementary Note advises avoiding routeing close to residential areas as far as possible on grounds of general amenity.

[5] Paragraph 2.8.5, National Policy Statement for Electricity Networks Infrastructure (EN-5), July 2011

Summary of WPD's Guidance and Policy on Overhead Line Routeing

4.9 WPD's guidance on overhead line routeing identifies areas which it seeks to avoid and areas on which it seeks to minimise effects. These are summarised with reference to the aspect of guidance which identifies them in Tables 4.1 and 4.2 below.

Table 4.1: Features WPD Seeks to Avoid in Routeing

Feature	Reference
National Parks	Schedule 9/Holford Rule 1
Areas of Outstanding Natural Beauty	Schedule 9/Holford Rule 1
Heritage Coasts	Schedule 9/Holford Rule 1
World Heritage Sites	Schedule 9/Holford Rule 1
Sites of Special Scientific Interest	Schedule 9/Note to Holford Rule 2
Special Protection Areas	Schedule 9/Note to Holford Rule 2
Special Areas of Conservation	Schedule 9/Note to Holford Rule 2
Ramsar sites	Schedule 9/Note to Holford Rule 2
National Nature Reserves	Schedule 9/Note to Holford Rule 2
Scheduled Monuments	Schedule 9/Note to Holford Rule 2
Settlements	Supplementary Note on Residential Areas

Table 4.2: Features on which WPD Seeks To Minimise Effects

Feature	Reference
Listed buildings	Schedule 9/Note to Holford Rule 2
Conservation Areas	Schedule 9/Note to Holford Rule 2
Registered Parks and Gardens	Schedule 9/Note to Holford Rule 2
Registered Battlefields	Schedule 9/Note to Holford Rule 2
Areas of archaeological interest	Schedule 9/Note to Holford Rule 2
Designations of County, District and Local Value	Schedule 9/Supplementary Note to Holford Rules on Designations of County/District and Local Value
Woodlands and Ancient Woodland	Note to Holford Rules 4 and 5
Local Plan Allocations	Note to Holford Rule 7

4.10 In addition to identifying constraints in the form of specific features designated for protection, the Holford Rules identify guidance on landscape and landform to be considered in overhead line routeing.

4.11 The following chapter identifies the key constraints that have been taken into account along with landscape and landform in identifying potential route corridors.

5.0 CONSTRAINTS USED IN IDENTIFYING POTENTIAL ROUTE CORRIDORS

Approach to Features Identified in WPD Guidance

5.1 The constraints listed in Tables 4.1 and 4.2 above have been considered in identifying route corridors. The paragraphs below consider each of the constraints identified from WPD's guidance in turn.

5.2 The following are not present within the study area:

- National Parks;
- Heritage Coasts;
- World Heritage Sites;
- National Nature Reserves;
- Special Protection Areas;
- Ramsar Sites;
- Registered Parks and Gardens; and
- Registered Battlefields.

Areas of Outstanding Natural Beauty (AONB)

5.3 There are no AONBs within the study area. However, the Mendip Hills AONB lies immediately south of the A368 (which forms the southern boundary of the study area) between 500m and 1km south of the area of search for the proposed 400/132kV GSP substation at Sandford.

5.4 AONBs are designated under the National Parks and Access to the Countryside Act 1949 (as amended) for the purpose of conserving and enhancing the natural beauty of the area. A new overhead line would have an effect on the landscape which could affect the objective to conserve and enhance natural beauty. The Overarching National Policy Statement for Energy (EN1) highlights that the '*natural beauty of the landscape and countryside should be given substantial weight by the IPC in deciding on applications for development consent in these areas*'. EN1 also states that consideration should be given to purposes of nationally designated areas when siting development in close proximity to the boundaries of an AONB designation and that '*the aim should be to avoid compromising the purposes of designation and such projects should be designed sensitively given the various siting, operational, and other relevant constraints'*.

Sites of Special Scientific Interest (SSSIs)

5.5 SSSIs are sites designated for their biodiversity or geological interest and are protected under the Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2004. SSSIs are protected from development and operations which are likely to damage their special interest. Consultation with Natural England is required before consent can be granted for any development operations likely to damage the SSSI interest.

5.6 The nature of the interest for each site varies. The potential effect of an overhead line on a SSSI would vary depending upon the nature of the effect caused and the interest of the sites. The risk of harm to a SSSI from a new overhead line would depend on the nature of the effect considered in light of the special interest of that designated site. The Overarching National Policy Statement for Energy (EN1) states at paragraph 5.3.11 that:

> *'Where a proposed development on land within or outside an SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent should not normally be granted. Where an adverse effect, after mitigation, on the site's notified special interest features is likely, an exception should only be made where the benefits (including need) of the development at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of*

special scientific interest and any broader impacts on the national network of SSSIs.'

5.7 WPD's guidance advises that it should seek to avoid SSSIs when siting infrastructure and these have been regarded as features to 'seek to avoid' in route corridor studies.

5.8 Where avoidance is not possible, it is appropriate when investigating alignments within a corridor to consider in detail the effects of the overhead line on the interest of the SSSI.

Special Areas of Conservation (SACs)

5.9 There are no SACs within the study area, however component sites of North Somerset and Mendip Bats SAC lie to the north and south of the study area. The study area also lies within the 5km consultation zone around the component sites of the SAC identified by Natural England and North Somerset Council. This zone covers important bat feeding grounds and proposals for change will be subject to scrutiny for effects on the designated site.

5.10 SACs are all SSSIs but comprise the highest grade of sites of biodiversity importance and are afforded protection under The Conservation of Habitats and Species Regulations 2010.

5.11 The Regulations only permit development in the first instance on such sites where it is directly connected with or necessary for site management for nature conservation; or where the proposal would not be likely to have a significant effect on the conservation objectives of the site, alone or in combination with other plans and projects.

5.12 Where there are likely to be significant effects, consent for development can only be granted where it would not adversely affect the integrity of the site. This must take into account the manner in which the development will be carried out and any conditions that might be imposed on the consent or that there are no alternative solutions and the development must be carried out for imperative reasons of overriding public interest relating to human health, public safety or benefits of primary importance to the environment.

5.13 WPD's guidance advises that it should seek to avoid SACs when siting infrastructure. These are appropriate to regard as features to 'seek to avoid' in route corridor studies. Where avoidance is not possible, it would be appropriate when investigating alignments within a corridor to consider the nature of effects, particularly with regard to whether the proposed overhead line would be likely to give rise to significant effect on the conservation objectives of the site and with regard to potential effects on the integrity of the site.

Scheduled Monuments

5.14 The Ancient Monuments and Archaeological Areas Act 1979 is the legislation protecting archaeological features which appear on the 'schedule' kept by the Department of Culture, Media and Sport. 'Scheduling' is the only legal protection specifically for archaeological sites. National Policy Statement EN1 and the National Planning Policy Framework highlight the importance of Scheduled Monuments and set out a presumption in favour of their conservation.

5.15 Scheduled Monument Consent is required from English Heritage, the statutory adviser on the historic environment, for works directly affecting a Scheduled Monument. English Heritage must be consulted by local planning authorities outside Greater London on applications for planning permission likely to affect the site of a scheduled monument.

5.16 WPD's guidance advises that it should seek to avoid Scheduled Monuments in siting infrastructure. These are appropriate to regard as features to 'seek to avoid' in route corridor studies. Where avoidance is not possible, it would be appropriate when

investigating alignments within a corridor to consider the nature of effects, including on the setting of the monument, on a case-by-case basis.

Listed buildings

5.17 WPD's guidance summarised in Table 4.2 advises that it will 'seek to minimise effects' on listed buildings. Listed buildings are designated in three categories. The majority are Grade II listed buildings (92%); 5.5% of listed buildings are Grade II* and 2.5% of listed buildings are Grade I. National Policy Statement EN1 and the National Planning Policy Framework highlight the importance of listed buildings as a non-renewable resource and set out a presumption in favour of their conservation.

5.18 Planning authorities are required to consult with English Heritage on planning applications which may affect Grade I and Grade II* listed buildings outside Greater London. The setting of listed buildings is an important consideration when considering effects of development. All listed buildings have been considered in identifying route corridors to try to ensure that there is sufficient distance between them and potential alignments to ensure effects do not occur or can be minimised. Effects on setting would be considered initially in route corridor preference and in detail when identifying alignments in a preferred corridor.

Conservation Areas

5.19 Conservation Areas are areas designated by local authorities because of special architectural or historic interest and are protected under the Planning (Listed Buildings and Conservation Areas) Act 1990. The importance of these designated sites and the presumption in favour of their conservation is set out in National Policy Statement EN1 and the National Planning Policy Framework. Conservation Area consent is required from the local planning authority for any development within the area. They are often, although not exclusively, associated with settlements and may be in their core or embedded within a larger expanse of built form. The setting of Conservation Areas may be particularly important as the designation refers to the overall character of an area and the juxtaposition of buildings, spaces and other features which contribute to its character.

5.20 During identification of route corridors settlements are sought to be avoided and this is likely to minimise effects on Conservation Areas by increasing the separation between them and a new overhead line.

5.21 Conservation Areas have been considered in identifying route corridors. Effects on setting would be considered initially in route corridor preference and in detail when identifying alignments.

Areas of Archaeological Interest

5.22 Above ground archaeological interest is addressed in identifying route corridors by considering listed buildings, Scheduled Monuments and Conservation Areas. Development plans indicate areas of archaeological potential and interest. These are at the scale of a local planning authority's administrative area and typically refer to areas of below ground potential.

5.23 The potential effects of an overhead line on these areas are usually limited to areas of ground excavation which are limited to tower foundations. Effects from underground cables are more destructive along the entire length of the cables route.

5.24 Areas of archaeological interest will be considered when identifying alignments. The potential effects on areas of archaeological significance would be investigated as part of alignment studies to minimise effects on this resource. Measures to minimise effects would include siting of tower foundations and mitigation such as archaeological investigation during excavation. Areas of non-designated archaeological interest have not been used as the basis for identifying route corridors.

Designations of County, District and Local Value

5.25 There are a number of county, district and local designations related to environmental value which are presented in the adopted North Somerset Council (NSC) Replacement Local Plan (2007). These typically relate to archaeology, landscape and ecology. Effects on areas of archaeological interest are discussed above.

Landscape

5.26 National government guidance in the National Planning Policy Framework advises that local planning authorities should adopt a criteria-based approach to protecting the best landscapes and promoting enhancement of other landscapes using tools such as landscape character assessment.

5.27 Landscape character has been considered in the identification of route corridors (see paragraphs 3.9 – 3.15 above).

Ecology

5.28 Sites of ecological interest are identified at county, district and local level. Designations in the study area include: Wildlife Sites and Local Nature Reserves.

Wildlife Sites

5.29 NSC Replacement Local Plan designates non-statutory Wildlife Sites. Where the importance of development and its overriding need is considered to outweigh the ecological interests of a Wildlife Site, a mitigation strategy would be required as a condition of an application. Under NSC's biodiversity policy a full biodiversity impact assessment could also be potentially required.

5.30 Designated sites in the study area have been considered in identifying route corridors. Minimising effects on these would also be considered in identifying route alignments where corridors are unable to avoid such areas. Options to route the line to reduce effects or the use of mitigation such as habitat creation would be considered.

Local Nature Reserves

5.31 Local Nature Reserves can be established by a local planning authority under section 21 of the National Parks and Access to the Countryside Act (1949). They are established to preserve features of interest and to provide opportunities for further research and to encourage the public to appreciate nature. The sites represent easily accessible natural areas and are particularly beneficial for education.

5.32 National Policy Statement EN1 recognises that Local Nature Reserves have a fundamental role to play in meeting biodiversity targets; contributing to quality of life and supporting research and education. The NPS states at paragraph 5.3.13 that '*the IPC should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse consent*'.

5.33 Where present these sites have been considered in identifying route corridors. Where a connection through sites is unavoidable options to reduce effects would be considered.

Woodlands and Ancient Woodland

5.34 Table 4.2 notes that Holford Rules 4 and 5 refer to woodlands and their value in providing background to views and advise to avoid cutting extensive swathes through woodland blocks where possible.

5.35 Any form of woodland generally has landscape value whereas ecological value can vary greatly between different types of woodland. A woodland with relatively low ecological value may perform the same screening or backgrounding function in the landscape as one with very high ecological value. However ancient woodland is a very high value nature conservation asset. Much ancient woodland is SSSI and is protected by that designation.

5.36 National Policy Statement EN1 highlights the importance of ancient woodland as a non-renewable resource. Paragraph 5.3.14 of EN1 states that '*the IPC should not grant development consent for any development that would result in its loss or deterioration unless the benefits (including need) of the development, in that location outweigh the loss of the woodland habitat*.'

5.37 Woodland has been considered in the identification of route corridors and ancient woodland has been identified separately. Corridors have been identified which seek to avoid woodland.

5.38 Where woodland is included in an identified route corridor, it is where there is high confidence that at least one alignment can be found within the corridor which would avoid the woodland.

Settlements and residential properties

5.39 WPD's guidance states that overhead line routes should avoid residential areas and that developed areas should be treated as areas of exceptional constraint.

5.40 WPD recognises that its works may have an adverse effect on general amenity. Its Schedule 9 Statement commits to implementing mitigation measures to reduce adverse effects as far as practicable. WPD is committed to using environmental impact assessment techniques to assess effects and identify opportunities for mitigation. It commits to consultation during this process and where the effect of its works is significant, to consulting affected residents.

5.41 Residential properties have been identified from Ordnance Survey maps and during site visits. The approach taken to residential properties (whether individual properties or in groups or settlements) is that these are included in corridors where there is high confidence that alignments can be identified which would avoid oversailing or siting infrastructure within gardens or its immediate curtilage.

Local Plan Allocations

Housing Allocations

5.42 Table 4.2 confirms that the Supplementary Note to Holford Rule 7 advises that routeing should consider '*effects on the amenity of existing development and on proposals for new development*'.

5.43 The identification of constraints has included allocations in adopted development plans for residential development. These have been treated as if they are existing residential development in the identification of route corridors. Other allocations for development, such as industrial and commercial allocations, have not been considered constraints to the identification of route corridors.

Mineral Reserves

5.44 Mineral reserves may extend for large areas, particularly where large 'areas of search' have been identified. It would be inappropriate to constrain route corridors to areas which are not in any area of search for mineral reserves. However it would also be imprudent to seek to site a new overhead line on scarce reserves which have a high prospect of being won in the life of the overhead line, as far as that can be determined at this time.

5.45 The approach taken to mineral reserves is to identify active mineral working sites with available reserves and to seek to avoid these areas.

Green Belt

5.46 There is no Green Belt land within the study area and therefore this does not represent a constraint within this study.

Flood Risk

5.47 The importance of flood risk has been emphasised since the severe floods of 2007 and was a key concern raised by the Environment Agency in initial discussion. WPD considers its siting of installations such as substations very carefully in relation to flood risk. However it is relatively straightforward to build flood resilience into overhead lines by addressing safety clearances from anticipated flood levels in line design. The presence of overhead line pylons or wood poles in areas of flood risk has negligible effect on the risk or displacement of water as their construction poses no material changes to water flow. Flood risk has therefore not been considered an influence on the identification of overhead line route corridors.

5.48 The features considered as constraints to route corridors are presented in Table 5.1 below with the data sources from which information (where applicable) was taken.

Table 5.1: Constraints to Route Corridors and Data Sources

Feature	**Data Sources**
Areas of Outstanding Natural Beauty	magic.gov.uk
Sites of Special Scientific Interest	gis.naturalengland.org.uk
Special Areas of Conservation	gis.naturalengland.org.uk
Scheduled Monuments	english-heritage.org.uk
Settlements	Digitised from Ordnance Survey
Historic buildings (Listed I, II and II*)	english-heritage.org.uk
Conservation Areas	Development plans
Unregistered Parks and Gardens	Development plans
Woodlands and Ancient Woodlands	National Inventory of Woodlands
Development plan allocations for housing	Development plans
Active mineral extraction sites with reserves	Development plans
Wildlife Sites	Development plans
Local Nature Reserves	Development plans

5.49 The following Chapter describes the study area, referring to these constraints.

6.0 CONSTRAINTS WITHIN THE STUDY AREA

General Overview

6.1 The study area is focussed in the area to the west of the existing WPD 132kV F Route overhead line and the east of the M5 motorway. The northern extent is defined by the existing WPD 132kV AT Route overhead line and the southern extent by the A368 which forms the northern boundary to the Mendip Hills AONB. Although it would be technically feasible to cross the M5 with the connection, it would result in a longer route length and would offer no environmental benefits over routes that connect to the AT Route to the east of the motorway.

6.2 The study area falls within the administrative control of North Somerset Council (NSC).

6.3 The study area is rural with much of the land comprising flat low-lying pasture and moor typical of the Avon Levels and Moors. Fields are generally bordered by ditches and rhynes, some with mature scrub and hedgerows. Built development comprises small villages and isolated properties interconnected by narrow hedged lanes. Built form is generally towards the edges of the study area on higher ground and includes Sandford, Banwell and Locking on the southern edge of the study area. Weston-super-Mare extends west from the M5 motorway to the coast.

6.4 There are a number of public rights of way in the study area crossing farmland and along narrow access tracks. The Strawberry Line (also known as the Cheddar Valley Railway Walk) follows the route of a disused railway and forms a strategic cycle and footpath link between Yatton and Cheddar.

6.5 The southern part of the study area is defined by almost continuous ribbon development including houses, small manufacturing units, agricultural facilities and community buildings. To the south of this development the land rises sharply and the slopes are often heavily wooded. The change in landform marks the start of the Mendip Hills AONB which forms a prominent backdrop to the predominantly flat land of the study area.

Environmental Constraints

6.6 A description of the study area in relation to the environmental criteria used for identifying route corridors defined in Chapter 5.0 is presented below and illustrated at Figure 3.

Areas of Outstanding Natural Beauty (AONB)

Mendip Hills AONB

6.7 The Mendip Hills AONB lies immediately south of the A368 (which forms the southern boundary of the study area) between 500m and 1km south of the area of search for the proposed substation in the vicinity of Sandford. The designation covers an area of approximately 200km^2 and is an extensive range of limestone hills to the south of Bristol. The hills run in an east to west direction between the coast at Weston-super-Mare and Frome. They overlook the Somerset Levels to the south and the Avon Valley to the north.

6.8 The designation relates to landscape and scenic importance although the Mendip Hills are also valued for the many industrial archaeological sites reflecting the lead, coal and cloth industries. The AONB is characterized by an open largely treeless limestone plateau surrounded by gorges, cliffs and wooded escarpment slopes. The hills of the AONB to the south of Sandford and Banwell form prominent landmarks.

Sites of Scientific Interest (SSSI)

6.9 SSSIs are designated as examples of the country's best wildlife and geological sites. There is one SSSI in the study area and two just outside. The sites and the reasons for their designation are summarised in Table 6.1.

Table 6.1 – Summary of SSSIs

SSSI	Location / Grid Ref	Reason for Designation
Puxton Moor	North of the Mendip Hills AONB (ST 440700)	This site (which is also designated as a Wildlife Site) forms part of the Avon Levels and Moors, an extensive area of low lying agricultural land north of the Mendip Hills. The ditch network is designated as a SSSI for its ditches and rhynes which act as 'wet fences'. The combination of management practices and variation in soils has resulted in watercourses which support a wide range of aquatic plant communities, many of which are of considerable nature conservation interest. The existing WPD 132kV overhead line (F Route) travels along the eastern edge of Puxton Moor and the connecting 132kV overhead line (AT Route) runs east-west across the SSSI.
Outside but close to the Study Area		
Banwell Ochre Caves SSSI	East of Banwell (ST 407593)	This SSSI lies within the Mendip Hills AONB and forms part of the North Somerset and Mendip Bats SAC. The SSSI comprises 5 caves which contain the most extensive and accessible yellow ochre workings in the Mendip Hills.
Banwell Caves SSSI	South of Banwell (ST 383588)	This SSSI lies within the Mendip Hills AONB and forms part of the North Somerset and Mendip Bats SAC. It is a Geological Review Site and is used as a hibernation site by Greater Horseshoe Bats.

Special Areas of Conservation (SAC)

6.10 There are no SACs within the study area, however the component sites of the North Somerset and Mendip Bats SAC lie to the north east (King's Wood and Urchin Wood), south (Banwell Ochre Caves) and the south west (Banwell Caves).

North Somerset and Mendip Bats SAC

6.11 North Somerset and Mendip Bats SAC is centred on the Mendip Hills. The SAC comprises caves, grassland and woodland and is a composite site spread across a wide area.

6.12 These sites are considered of international importance for their semi-natural dry grasslands, significant blocks of *Tilio-Acerion* forest and the limestone caves of the Mendips which provide a range of important hibernation sites for lesser horseshoe bats. Natural England and North Somerset Council have identified a 5km 'consultation zone' which covers important bat feeding grounds surrounding the SAC and in which proposals for change are subject to particular scrutiny for potential effects on the designated sites. The 5km 'consultation zone' covers the study area. It is not anticipated that there would be any direct impact on roosts from the proposed connection. The potential effects of the connection would be assessed through surveys and consultation with Natural England and NSC. Any loss of foraging habitat would be minimised as far as possible through scheme design and should be capable of mitigation.

Local Nature Reserves (LNRs)

6.13 There is one LNR on the eastern edge of the study area. It is a dismantled mineral railway line which enters the study area from Winscombe and Sandford in the south and leaves the study area to the north of Droveway Farm and Bridge Farm. It is known as the Strawberry Line or Cheddar Valley Railway Walk and is also National Cycleway (Route 26). The interest in this LNR is primarily recreational rather than due to rarity of flora and fauna. This LNR is not designated as a Site of Special Scientific Interest.

6.14 NSC's Replacement Local Plan contains policies which re-affirm the statutory protection given to this site.

Wildlife Sites

6.15 These are non-statutory sites designated under Policy ECH/14 of the NSC Replacement Local Plan. The wildlife sites within the study area include:

- Puxton Moor – this wildlife site includes the ditches and rhynes within the SSSI and the intervening fields. It extends to include fields and drains which are not part of the SSSI and covers the land containing parts of the existing AT route overhead line. It is also noted as having a relict Roman Landscape (2,000 years old);
- Fields and rhynes west of Moorland Farm – this wildlife site covers a network of ditches and rhynes and surrounding fields;
- Towerhead Brook – this wildlife site includes the watercourse and some adjacent fields, ditches and rhynes;
- Part of Grumplepill Rhyne – this wildlife site covers Grumplepill Rhyne between the M5 and the edge of Weston-super-Mare; and
- Part of the River Banwell – this wildlife site covers the River Banwell and associated river banks along a section of the river.

Scheduled Monuments

6.16 The south west of England is a region of high archaeological and historical importance and contains over a third of all Scheduled Monuments in England. There are two Scheduled Monuments in the study area:

- A moated site at Nye Farm; and
- A deserted farmstead 420m to the south of Gout House Farm.

6.17 A Romano British Villa is present on the edge of Banwell immediately south of the study area. There are also a number of Scheduled Monuments in the Mendip Hills AONB to the south of the study area. These include: Banwell Camp; a Roman settlement and associated industrial remains and field systems to the north east of Winthill farm; a Roman camp in Banwell Woods; Star Roman villa, 275m north east of Wimblestone; and Dolebury Camp.

Listed Buildings

6.18 There are no Grade I listed buildings within or adjacent to the study area. There are a number of Grade II and II* listed buildings within the settlements of Locking and Banwell south of the study area and a number of isolated Grade II listed buildings in the study area including:

- Poplars (including a garden wall);
- Stuntree Farm; and
- An outhouse immediately west of Puxton Moor Farmhouse.

6.19 There are other Grade II listed buildings towards the fringes of the study area including buildings in Sandford and Banwell to the south; and a few buildings within Puxton to the north of the AT Route and west of Puxton Moor SSSI.

Conservation Areas

6.20 There are no Conservation Areas within the study area. Banwell Conservation Area lies adjacent to the southern boundary of the study area and its designation covers the eastern end of Banwell and extends to include a field along Riverside which contains a Scheduled Monument (Romano British Villa). This site is beyond the area of search for potential route corridors and its setting would not be affected by this study.

Woodland and Ancient Woodland

6.21 There are few woodlands in the study area and none designated as ancient woodland. The land is typically flat and where woodland occurs it is in the form of small copses, shelterbelts and some lines of trees as part of hedgerows. The brooks sometimes have mature willows along them. Frequent hedgerow trees; a commercial orchard and woodland and scrub along the Strawberry Line are to north of Sandford and provide enclosure and a perceived wooded character to the landscape close to the area of search for the proposed 400/132kV GSP substation. The constraints map indicates a number of small woodlands close to the existing AT Route. The woodland is illustrated on Figure 3.

6.22 Broadleaved woodlands on the rising ground at the Mendip Hills and Cleeve Ridge are prominent within the wider landscape but would not be affected by route corridor proposals in this study.

6.23 The NSC Replacement Local Plan has a policy promoting the Forest of Avon (a community forest). There are no known Forest of Avon sites in the study area, but application of this policy would seek to ensure that any overhead line proposals incorporate a good standard of hedgerow and tree replacement and screening where this is compatible with maintaining overhead line clearances.

Settlements and Individual Properties

6.24 There are few settlements in the study area. The majority of the land is typically low-lying with frequent ditches to aid drainage. Settlements are on slightly higher ground beyond the southern fringes of the study area. The largest settlements include Banwell and Locking which lie immediately south of the study area and Weston-super-Mare which lies on the western edge of the study area and extends from the M5 to the coast at the Severn Estuary.

6.25 Smaller settlements and hamlets are present in the study area including Stonebridge, Woolvershill Batch, Rolestone, East Rolestone, Nye and Way Wick most of which comprise clusters of properties and farmsteads.

6.26 There are also a few isolated farmsteads within the central part of the study area connected by narrow lanes bordered by hedgerows or ditches.

Local Plan Housing Development Allocations

6.27 There are no housing allocations within the study area although there is one housing allocation immediately west of the study area on the edge of Weston-super-Mare to the west of the M5. Infill development may occur at the edges of other settlements in the study area, however this would not be affected by the proposed connection which seeks to avoid settlements.

Minerals Sites

6.28 There are no mineral sites within the study area.

Landform

6.29 The landform of the study area shows subtle variations and is illustrated at Figure 4.

6.30 In the northern and central parts of the study area, the land is generally low-lying, flat and associated with moors. Fields are drained by a series of ditches and rhynes at between 5m

and 10m above ordnance datum (AOD). There is little variation in landform. Towards the south of the study area the land gradually rises and becomes slightly more undulating around Banwell, Locking and Woolvers Hill rising to 30m AOD. Localised undulations are associated with the network of small river valleys through the land.

6.31 The Mendip Hills AONB is to the south of the study area and comprises a series of limestone hills. The hills rise sharply to 97m AOD at Banwell Plain, 118m AOD at Banwell Hill, 120m AOD at Sandford Hill and 175m AOD at Loxton Hill. The only significant break in the hills is the valley of the Lox Yeo River through which the M5 motorway and the existing WPD 132kV overhead line (F Route) currently travel. The hills provide a backdrop in views throughout the study area and the break in the hills is also visible.

Landscape Character

6.32 The study area is predominantly within the former Countryside Agency (now Natural England) countryside character area of the Somerset Levels and Moors. Two other character areas: The Mendip Hills; and Bristol, Avon Valleys and Ridges are to the south and south east of the study area respectively.

6.33 The study area is also covered by the North Somerset Landscape Character Assessment (LCA). There are three landscape character areas in the study area: Locking and Banwell Moors; Kingston, Seymour and Puxton Moors; and River Yeo Rolling Valley Farmland. Two further character areas border the study area within the Mendip Hills AONB: Mendip Ridge; and Lox Yeo Rolling Valley Farmland. Table 6.2 below shows the relationship between the national and local level assessments. The National Landscape Character Areas are illustrated at Figure 5 and the Local Landscape Character Areas on Figure 6.

Table 6.2 – Relationship between national and local landscape character areas

National Landscape Character Assessment	North Somerset Landscape Character Assessment
Within the Study Area	
Somerset Levels and Moors	Locking and Banwell Moors
	Kingston, Seymour and Puxton Moors
	River Yeo Rolling Valley Farmland
To the south east of the study area	
Bristol, Avon Valleys and Ridges	River Yeo Rolling Valley Farmland
To the south of the edge of the study area	
Mendip Hills	River Yeo Rolling Valley Farmland
	Mendip Ridge
	Lox Yeo Rolling Valley Farmland

6.34 NSC adopted its LCA in 2005 as Supplementary Planning Guidance (SPG). The guidance provides written commentary on the features of the landscape which contribute to local distinctiveness and includes guidelines as to how such features might be protected, conserved and enhanced.

6.35 The northern and central parts of the study area lie within the Kingston, Seymour and Puxton Moors Landscape Character Area (Area A1). This lies immediately west of the Weston 'tee' extending south to Nye Drove.

6.36 Locking and Banwell Moors (Area A4) covers a swathe of land through the central and southern parts of the study area. As the land rises in the eastern, western and southern parts of the study area it becomes part of the River Yeo Rolling Valley Farmland Character Area (Area J2).

6.37 The North Somerset LCA notes that Area A1 has a strong and remote character with more evidence of historic features and field boundary patterns than Area A4. It judges the

landscape as having a strong character in good condition. Strategies are provided which seek to conserve the landscape. A 132kV overhead line on steel lattice pylons (AT Route) is within this character area.

6.38 Area A4 is described as being similar to Area A1 with a recognisable pattern of fields bordered by ditches and rhynes. However, it is influenced by marginal activities such as horse grazing, scrap yards and caravan parks. The character is defined as moderate with a declining condition. Landscape strategies are focused on conserving and enhancing the landscape. Weston 'tee' is on the edge of this character area as are a number of 33kV wood pole overhead lines and a 132kV overhead route on steel lattice pylons (F Route).

6.39 Area J2 is described as being a peaceful pastoral landscape with the presence of waterways signalled by lines of willows. The land contains scattered farmsteads and larger villages on higher land. This character is being eroded in places by ribbon development. The strength of character is described as being moderate and the condition good. The landscape strategies for this area are to conserve and strengthen the character.

6.40 Any proposals for route corridors and alignments will need to demonstrate that the local distinctiveness and landscape character is not adversely affected. The LCA does not give specific guidance in relation to overhead lines and does not make reference to the presence of overhead lines within the landscape although the 132kV WPD distribution network is present in the areas described.

7.0 ZONES OF INVESTIGATION

7.1 This chapter identifies broad zones of investigation within the study area within which potential route corridors will be identified. It considers the influences and constraints identified within Chapter 5.0 and described within the study area in Chapter 6.0.

7.2 As detailed in Chapter 3.0, a desk based assessment supplemented with site visits has been undertaken to consider and identify possible route options for the required connection.

7.3 The zone of investigation initially looked at narrowing the study area focusing primarily on the most direct route between the area of search for the proposed substation and the existing AT Route. To the west of the study area the M5 motorway provides a constraint. There is no environmental benefit provided by extending the study area beyond the M5 as it would require additional length of overhead line, taller pylons or wood poles to ensure safety clearance above the motorway and would bring a connection closer to residential properties on the edge of Weston-super-Mare. The southern part of the study area was limited to maximise the distance of potential corridors from settlement at Banwell, Banwell Conservation Area and the Mendip Hills AONB. The northern boundary is formed by the AT Route and the eastern boundary by the existing 132kV F Route overhead line and the Weston 'tee'.

7.4 Three zones of investigation have been identified and are illustrated on Figure 7:

- Eastern Zone: this takes a line almost straight between the area of search for the proposed substation and the AT Route;
- Central Zone: extends to the west of the area of search for the proposed substation avoiding properties at East Rolestone; and
- Western Zone: this seeks to make a connection close to the M5 to maximise the length of AT Route that could be removed.

7.5 This Chapter presents a description of the three zones with reference to environmental constraints.

Descriptions of zones of investigation

Eastern Zone

7.6 The eastern zone extends in a northerly direction from the area of search for the proposed 400/132kV GSP substation passing along Drove Way close to properties at Nye. The zone continues north through the southern part of Puxton Moor SSSI and Wildlife Site to Weston 'tee' and the AT Route. The zone is defined in the east by the existing 132kV F Route overhead line and in the west by clustered properties around Box Bush Stables.

7.7 The zone comprises predominantly flat land within the River Yeo Rolling Valley Farmland (Area J4), Locking and Banwell Moors (Area A4) and the eastern edge of Kingston, Seymour and Puxton Moors (Area A1) character areas. This describes the land as rural and tranquil. The land in this zone is mostly pasture fields bordered by ditches and rhynes with hedgerows and some hedgerow trees. Hedgerows become thicker and trees more frequent within the River Yeo Rolling Valley Farmland close to the area of search for the proposed 400/132kV GSP substation. The Weston 'tee' lies on the boundary between the Locking and Banwell Moors and Kingston, Seymour and Puxton Moors character areas.

7.8 This zone is mostly within the landscape character area Locking and Banwell Moors which is reported as being a lower quality landscape than Kingston, Seymour and Puxton Moors.

7.9 This zone has the fewest properties and only passes close to properties at Nye Farm, Nut Tree Farm, Rookery Farm East and South Farm and farmsteads and buildings on Box

Bush Lane. It remains generally within farmland. The zone crosses Puxton Moor SSSI and Wildlife Site at the eastern end of the AT Route but extends to include land to the west which offers the potential to avoid the designations and remove a length of AT Route through the designations.

Central Zone

7.10 The central zone extends west from the area of search for the proposed substation and passes through farmland. It includes West Leigh Farm which is immediately west of the area of search for the proposed 400/132kV GSP substation. It crosses Towerhead Brook Wildlife Site. The zone continues across farmland and includes a Scheduled Monument (Deserted farmhouse 420m to the south of Gout House Farm). The zone includes properties at Box Bush Farm, Puxton Road in East Rolstone and at Rolstone adjacent to the AT Route. It is considered that there is sufficient separation between buildings to identify corridors which avoid properties.

7.11 The zone comprises generally flat land within the Locking and Banwell Moors and Kingston, Seymour and Puxton Moors character areas. The land within this zone has a strong sense of remoteness and is mostly pasture fields bordered by ditches and rhynes with hedgerows and some hedgerow trees. The AT Route lies in the Kingston, Seymour and Puxton Moors character area.

Western Zone

7.12 The western zone extends in a westerly direction from the area of search for the proposed 400/132kV GSP substation passing to the south of fields adjacent to Towerhead Brook which are part of Towerhead Brook Wildlife Site. It crosses the Towerhead Brook Wildlife Site and heads in a westerly direction, crossing Riverside and the River Banwell Wildlife Site. To the north of Banwell Conservation Area and a listed building at Stonebridge the zone travels in a north westerly direction and includes fields and rhynes to the west of Moorland Farm which are a designated Wildlife Site. The zone extends across farmland to meet the AT Route to the south of Junction 21 of the M5 and includes isolated farmsteads and a cluster of properties at Way Wick.

7.13 This zone is predominantly in the Locking and Banwell Moors character area although part of the zone lies in the River Yeo Rolling Valley Farmland character area close to the area of search for the proposed 400/132kV GSP substation. Locking and Banwell Moors area is considered as having a weaker strength of character and condition than the immediately adjacent Area A1.

7.14 A corridor in this zone would represent the longest and least direct route between the two connection points but offers the opportunity to remove the greatest length of the existing 132kV AT Route overhead line.

Summary

7.15 The zones of investigation are defined by very similar features and constraints. There is little environmental advantage between the eastern or central zones. Therefore both should be taken forward for further consideration.

7.16 Any corridor in the western zone would require a longer route and would bring an overhead line closer to a greater number of properties. This zone was initially identified to provide a connection closer to Weston-super-Mare enabling a greater length of line between the Weston ‘tee’ and M5 to be removed. However, this would take a connection closer to Banwell Conservation Area and the edge of the Mendip Hills AONB. It also encompasses a Wildlife Site to the west of Moorland Farm and would cross the Towerhead Brook and River Banwell Wildlife Sites. Although this option offers the opportunity to remove the greatest length of the AT Route, it is longer than the other routes and crosses a number of designations. This zone of investigation was considered more environmentally constrained

than the central and eastern zones and has not been taken forward for further investigation.

8.0 ROUTE CORRIDORS AND COMPARISON OF CORRIDORS

8.1 There are relatively few environmental constraints which would influence route corridors within the eastern and central zones of investigation. The corridors have been defined based upon the following principal considerations:

- establishing the most direct route between the area of search for the proposed substation and the AT Route;
- maximising distances from properties;
- seeking to avoid compromising the purpose of designation of the Mendip Hills AONB;
- seeking to minimise effects on Scheduled Monuments;
- seeking to minimise effects on Puxton Moor SSSI and Wildlife Site and other Wildlife Sites in the study area; and
- seeking to avoid mature trees or hedgerows.

8.2 Where corridors pass close to properties they have avoided the property and its curtilage. 'Pinch points' related to properties are described within the descriptions of route corridors below.

8.3 The following corridors have been identified for further consideration:

- **Corridor A**: establishing a direct connection north from the area of search for the proposed 400/132kV GSP substation to the AT Route west of Puxton Moor SSSI and Wildlife Site;
- **Corridor B**: establishing a new connection which connects with the AT Route to the west of Puxton Moor SSSI and Wildlife Site;
- **Corridor C**: establishing a new connection to the west of East Rolstone; and
- **Corridor D**: establishing a new connection closer to the M5 to maximise the length of the AT Route that could be removed.

8.4 The corridors have been assessed based on the assumption that a new 132kV overhead line will comprise: two parallel single circuit overhead lines supported on wood poles; or two single circuit overhead lines supported on wood poles using two different corridors; or a double circuit overhead line supported on steel lattice towers. The environmental constraints or benefits associated with using underground cables within the corridors is stated where relevant. The potential corridors are illustrated at Figure 8.

Corridor A

8.5 Corridor A leaves the area of search for the proposed substation in a northerly direction following Drove Way. It initially crosses farmland with generally low hedgerows and frequent trees and scrub along ditches. There are views south from within the corridor towards the high ground of the Mendip Hills AONB. The use of underground cables close to the area of search for the proposed substation would provide benefits to the visual amenity of a number of properties and would minimise the perception of wirescape as the 132kV overhead line would be viewed cumulatively with National Grid's proposed 400kV overhead line from some receptors.

8.6 The corridor passes through fields between Rookery Farm East, Nye Farm and Nut Tree Farm. These properties have mature trees along garden boundaries which would help to filter views of a new overhead line. The existing 132kV line is visible; therefore intervisibility between the proposed lines and the new National Grid 400kV overhead line would be possible and effects would require further consideration as part of detailed routeing studies. The eastern edge of the corridor lies within 30m of a Scheduled Monument at Nye Farm. Direct effects on this site could be avoided with alignments in this corridor and it is anticipated that significant adverse effects on the setting of the Monument could be

avoided. Potential effects would require careful consideration as part of detailed routeing studies if this corridor is taken forward.

8.7 The corridor continues north west and includes a small area of woodland immediately north of Nut Tree Farm. There is sufficient space within the corridor to avoid this with potential route alignments. The corridor then crosses a public right of way on Nye Drove and is to the east of another public right of way which runs parallel to the western boundary of the corridor. The corridor then continues through farmland which is predominately pasture with frequent ditches and rhynes. Long views are possible across this land as there are few trees and low hedgerows. There are long views south towards the Mendip Hills AONB throughout this corridor.

8.8 The corridor travels parallel to the south western boundary of the Puxton Moor SSSI and Wildlife Site where land has few trees and boundaries are generally formed by ditches with wetland vegetation and scrub. The corridor avoids land protected by the SSSI designation and due to the width of the corridor routes could be identified which avoid impacts on the features of special interest of this site.

8.9 There are no properties in the corridor. However, the corridor does pass through a narrow belt of farmland between Rookery Farm East, Nye Farm and Nut Tree Farm and its connection point to the AT Route is close to South Farm. Properties have mature trees either in the curtilage or along adjacent ditches and rhynes which provide filtering to views in the direction of the corridor.

Corridor B

8.10 Corridor B extends slightly further west than Corridor A passing through farmland bordered by low hedgerows and trees. Immediately north of the area of search for the proposed 400/132kV GSP substation the corridor travels along the north eastern edge of Towerhead Brook Wildlife Site. The use of underground cables close to the area of search for the proposed substation would provide benefits to the visual amenity of a number of properties and would minimise the perception of wirescape as the 132kV overhead line would be viewed cumulatively with National Grid's proposed 400kV overhead line from some receptors.

8.11 The corridor passes to the west of Rookery Farm East and east of a small woodland copse before crossing Nye Drove (a small track and public right of way).

8.12 The corridor includes a small water body surrounded by trees to the south of Rockers Rhyne. However, it would be possible to avoid this feature by routeing either to the east or west.

8.13 The corridor continues in a northerly direction across farmland comprising fields bordered by ditches and rhynes with few hedgerows or trees. Some trees are present along Havage Drove and the adjacent watercourse which provide some vertical structure in the landscape. The corridor continues through relatively open farmland with occasional trees to its connection point with the AT Route. There are long views south towards the Mendip Hills AONB throughout this corridor.

8.14 There are no properties in this corridor although it passes to the west of Rookery Farm East and to the east of a cluster of farmsteads, agricultural buildings and a depot around Box Bush Farm. An overhead line could be routed in this corridor to avoid residential properties. However, the proximity of a potential overhead line to Rookery Farm East will require consideration as part of detailed routeing studies if this corridor is taken forward.

Corridor C

8.15 Corridor C travels in a north westerly direction from the area of search for the potential 400/132kV GSP substation initially crossing small fields bordered by mature hedgerow boundaries and frequent trees. The corridor passes to the north of West Leigh Farm and the most mature of these hedgerow boundaries. The corridor travels through the Towerhead Book Wildlife Site which is characterised by ditches and rhynes with varied wetland flora and fauna. Ecological surveys would be required but there is a high confidence that significant adverse effects on the features of special interest of the Wildlife Site could be avoided or mitigated to acceptable levels.

8.16 Similar to Corridors A and B the use of underground cables close to the area of search for the proposed substation would provide benefits to visual amenity of a number of properties and would minimise the perception of wirescape. However, the installation of underground cables within the Towerhead Brook Wildlife Site has the potential to result in effects on the flora and fauna and the hydrological regime of the site as the cables would be installed across or beneath the ditches and rhynes which characterise the site. The effects of routeing underground cables through this site would require consideration as part of detailed routeing studies to ensure any effects on the flora and fauna could be avoided or appropriately mitigated.

8.17 Beyond Towerhead Brook Wildlife Site the route continues in a north westerly direction through farmland with generally low hedgerows, frequent ditches and rhynes and few trees. The route passes within 95m of the Deserted Medieval Farmstead Scheduled Monument. The Scheduled Monument lies in the corner of a field with some scrub around it. It is anticipated that significant adverse effects on the setting of the Monument could be avoided however; potential effects would require careful consideration as part of detailed routeing studies if this corridor is taken forward.

8.18 The corridor then continues through farmland between Gout House Farm and Lower Gout Farm with frequent hedgerow trees which provide a degree of enclosure to the landscape. The corridor crosses Riverside to the south of Yew Tree and Laurel Farms. There is a line of mature trees close to the road which would constrain routeing although it would be possible to achieve routes within this corridor which avoid the trees.

8.19 Beyond Riverside the corridor continues through farmland and includes a small watercourse which is a tributary of the River Banwell and is part of the River Banwell Wildlife Site. Alignments which avoid the Wildlife Site would be constrained by Laurel Farm and other properties on West Rolstone Road. However due to the length of span between pylons or wood poles it is considered that an alignment could be achieved which oversails the Wildlife Site and avoids significant adverse effects on its features of interest. The installation of underground cables in this area has the potential to result in effects on the flora and fauna of the Wildlife Site as the cables would be installed across or beneath the watercourse. The effects of routeing underground cables through this site would require consideration as part of detailed routeing studies to ensure any effects on the flora and fauna in the Wildlife Site could be avoided or appropriately mitigated.

8.20 North of the Wildlife Site, the corridor crosses West Rolstone Road and travels through farmland characterised by frequent trees and hedgerows. The corridor passes between isolated farmsteads to its connection point with the AT Route. The corridor includes a small area of young woodland which could be avoided to the east or west by potential routes. The corridor crosses a number of public rights of way and byways which are characterised by mature hedgerows and trees.

8.21 The corridor contains properties on West Rolestone Road (on the edge of the corridor which could be avoided by an alignment) and passes close to a number of properties

including Westleigh Farm, Gout House Farm, Lower Gout Farm, Laurel Farm, The Homestead, The Poplars, properties at East Rolstone, The Laurels and Rolstone Court.

Corridor D

8.22 Corridor D leaves the area of search for the proposed 400/132kV GSP substation in a north westerly direction initially crossing fields bordered by either mature hedgerow boundaries and frequent trees or rhynes with scrub and few trees. The corridor crosses Towerhead Book Wildlife Site which is characterised by ditches and rhynes with varied wetland flora and fauna. Ecological surveys would be required but there is a high confidence that significant adverse effects on the features of special interest of the Wildlife Site could be avoided or mitigated to acceptable levels. This would require consideration as part of detailed routeing studies if this corridor is taken forward.

8.23 Similar to Corridors A, B and C the use of underground cables close to the area of search for the proposed substation would provide benefits to visual amenity of a number of properties and would minimise the perception of wirescape. However, the installation of underground cables within the Towerhead Brook Wildlife Site has the potential to result in effects on the flora and fauna and the hydrological regime of the site as the cables would be installed across or beneath the ditches and rhynes which characterise the site. The effects of routeing underground cables through this site would require consideration as part of detailed routeing studies to ensure any effects on the flora and fauna could be avoided or appropriately mitigated.

8.24 The corridor then continues in a westerly direction through farmland bordered by ditches and rhynes with infrequent trees. The corridor passes within 40m of the Deserted Medieval Farmstead Scheduled Monument. Direct effects on this site could be avoided with alignments in this corridor. It is anticipated that significant adverse effects on the setting of the Monument could be avoided however; potential effects would require careful consideration as part of detailed routeing studies if this corridor is taken forward.

8.25 The corridor continues in a north westerly direction crossing Riverside immediately north of Lower Gout Farm. The farmstead is bordered by mature trees and agricultural buildings which would filter and screen views towards an overhead line in the corridor.

8.26 The corridor continues through farmland immediately north of the River Banwell Wildlife Site and crosses a small tributary of the Wildlife Site. An alignment through this area could be achieved but would need to oversail the Wildlife Site. Due to the length of span between pylons or wood poles it is considered that an alignment could be achieved which oversails the Wildlife Site and avoids significant adverse effects on its features of interest. The installation of underground cables in this area has the potential to result in effects on the flora and fauna of the Wildlife Site as the cables would be installed across or beneath the watercourse. The effects of routeing underground cables through this site would require consideration as part of detailed routeing studies to ensure any effects on the flora and fauna in the Wildlife Site could be avoided or appropriately mitigated.

8.27 The corridor continues through farmland between the River Banwell and West Rolstone Road passing to the north of Waterloo Farm. Farmland is bordered by a mix of low hedges and scrub associated with ditches and rhynes and more mature hedgerows and trees. The corridor crosses a small lane which links West Rolstone Road with Silver Moor Lane and continues through farmland to its connection point with the AT Route. At its connection point with the AT Route the eastern edge of the corridor lies close to Stuntree Farm a Grade II listed building. In this area the corridor is over 200m wide and alignments could be identified which maximise distance and therefore minimise effects on the setting of the listed building.

8.28 The corridor includes properties on Riverside however alignments could be achieved which avoid these properties. The corridor passes close to the following properties: Westleigh Farm, Lower Gout Farm, The Homestead, Waterloo Farm, The Laurels, Rolstone Farm, Rolstone Manor Farm, Rolstone and Stuntree Farm.

Comparison of Corridors

8.29 The assessment of corridors is based on environmental considerations only. It does not take account of technical or economic factors or responses to consultation which will be taken into consideration by WPD before a preferred corridor is identified to be taken forward.

Mendip Hills AONB

8.30 An overhead line in any of the corridors identified would be present in some northerly views from the Mendip Hills AONB. These views would be most apparent from areas of higher ground within the AONB such as Sandford Hill, Banwell Hill or Dolebury Warren.

8.31 An overhead line within Corridor A or B would be preferable with respect to effects on views from the AONB, because it would adopt the shortest and most direct route. Overhead lines supported on wood poles are considered distinctly preferred to one supported on steel lattice pylons as it would be easier to assimilate into the landscape and would result in the least effect on views. The effects of a new 132kV overhead line on the purposes of the AONB designation would be assessed as part of detailed routeing studies.

8.32 The use of underground cables would provide the greatest benefit in the area close to the area of search for the proposed substation where overhead lines would be closest to the boundary of the AONB designation, the corridor of the proposed 400kV overhead line and existing residential properties.

SSSIs

8.33 All corridors avoid the Puxton Moor SSSI and would facilitate removal of the existing AT Route overhead line from within it. Initial consultation with NSC and Natural England indicated that they may prefer to leave a redundant stretch of overhead line within the SSSI due to the potential effects that may arise from its removal. These effects would require further consideration as part of the EIA.

8.34 Corridor A passes closest to the designation running parallel to the western boundary. However, due to the width of the corridor in this area it would be possible to identify routes which avoid impacts on the features of special interest of this site. There would, therefore, be no substantial difference between the corridors identified with regard to effects on SSSIs.

North Somerset and Mendip Bats SAC

8.35 All corridors avoid the component SSSIs of the North Somerset and Mendip Bats SAC (Banwell Caves SSSI and Banwell Ochre Caves SSSI) but pass through the 5km consultation zone that surrounds the SAC.

8.36 The potential impacts on SAC bat species (greater and lesser horseshoes) arising from an overhead line are primarily associated with loss of habitat resulting in fragmentation and degradation of foraging grounds. Until a detailed connection design is identified it is not possible to determine specific effects associated with habitat loss as pylon or wood pole positions have not been identified. The corridors are not strongly differentiated by their potential effects on the SAC but consideration would need to be given to routes that minimise habitat loss and local effects on SAC species as part of detailed routeing studies.

8.37 The potential impacts on SAC bat species arising from underground cables are primarily associated with loss of hedgerows and habitats. Studies on the use of the area by bats

would be required, as well as an assessment into the potential effects of the development, with particular regard to the removal of hedges or trees on bat flight patterns. Tree and hedge planting may be required as part of mitigation.

Strawberry Line LNR

8.38 All corridors would pass close to and potentially cross a section of the Strawberry Line (not covered by the LNR designation) to facilitate connections to the proposed GSP substation within the area of search to the West of Nye Road. There would, therefore, be no substantial difference between the corridors identified with regard to effects on this site but consideration would need to be given to alignments which minimise effects on this feature as part of detailed routeing studies.

8.39 There would be no substantial difference between the corridors identified with regard to effects on the Strawberry Line LNR if underground cables were used

Wildlife Sites

8.40 Corridors A and B do not cross any Wildlife Sites. Although Corridor B travels along the eastern boundary of Towerhead Brook Wildlife Site and Corridor A travels parallel to the western edge of Puxton Moor Wildlife Site and SSSI. Corridors C and D both cross Towerhead Brook Wildlife Site and the River Banwell Wildlife Site. Corridors A and B would be preferable to Corridors C and D in terms of potential effects on Wildlife Sites. This is the same for the construction of a double circuit overhead line supported on steel lattice pylons.

8.41 The use of underground cables within the Towerhead Brook and River Banwell Wildlife Sites has the potential to give rise to greater effects than the use of an overhead line. The effects of routeing underground cables through this site would require consideration as part of detailed routeing studies to ensure any effects on the flora and fauna within this area could be avoided or appropriately mitigated.

Scheduled Monuments

8.42 Corridors A, C and D all pass close to Scheduled Monuments. Nye Moat Scheduled Monument is surrounded by trees and therefore the setting may be less directly affected by an overhead line in Corridor A than the deserted farmstead Scheduled Monument which is in more open farmland between Corridors C and D (approximately 420m to the south of Gout House Farm). Corridor B maximises the distance from all Scheduled Monuments and intervening trees and built form would help to reduce and screen views limiting or preventing adverse effects on their setting.

8.43 Corridor B would also be preferable if a double circuit overhead line on steel lattice pylons was considered as it would maximise distance from the Scheduled Monuments. The other three corridors (A, C and D) all pass close to Scheduled Monuments and the increased height of the pylons would result in greater visibility which is likely to result in increased effects on the setting of these features.

8.44 There would be no substantial difference between the corridors identified with regard to effects on Scheduled Monuments if underground cables were used.

Listed Buildings

8.45 Corridors A, B and C avoid listed buildings. Corridor D passes immediately west of Stuntree Farm a Grade II listed farmstead in the vicinity of its connection point with the AT Route. Corridor D would be less preferable than the other three corridors in terms of effects on listed buildings. However, these effects are not considered so significant so as to render this option unacceptable.

8.46 There would be no substantial difference between the corridors identified with regard to effects on Listed Buildings if underground cables were used.

Woodlands

8.47 There is little woodland in the study area although mature hedgerows and small clusters of trees are present within all corridors. The corridors are of sufficient width to allow the avoidance of woodland when identifying alignments and there is little to distinguish between the corridors based upon this criteria.

Settlements and Individual Properties

8.48 There are relatively few properties close to any of the corridors. However, Corridors C and D both include individual properties and due to their greater length pass close to a greater number of properties than Corridors A and B. Careful siting of overhead lines will be necessary to seek to maximise the distance between the lines and properties to try and reduce visual effects and the perception of a 'wirescape' in views. Corridor B is most successful in avoiding properties and there are opportunities in parts of the corridor to use existing mature hedgerows and trees to provide screening and backgrounding of the overhead line. Corridor A is constrained between Rookery Farm East, Nye Farm and Nut Tree Farm with only a single field between the properties. However mature trees around the properties would filter views and limit adverse effects.

8.49 If a double circuit overhead line supported on steel lattice pylons was considered there is little preference in corridors as it would have a greater affect on the nature of views from properties than a wood pole line. Corridors A and B are closer to the new 400kV overhead line and the new connection would increase cumulative visual effects, however along Corridors C and D the new line would be introduced in a landscape which currently does not contain an overhead line and a greater number of properties would experience views of the new overhead line.

8.50 There would be no substantial difference between the corridors with regard to effects on settlements and individual properties if underground cables were used.

Landscape Character

8.51 All route corridors run through areas of similar landscape character and are not differentiated by the character areas affected

Conclusions

8.52 TEP has considered the corridors identified within this study in relation to the environmental criteria. The corridors show greatest distinction with regard to their effects on views from private properties and potential effects on Scheduled Monuments and Wildlife Sites. These are the primary aspects which influence the identification of the least environmentally constrained corridor. Two single circuit wood pole lines are considered preferable to a double circuit steel lattice overhead line as the wood pole lines would be easier to assimilate into the landscape and would result in the least effect on views from residential properties.

8.53 The use of underground cables would be of greatest benefit close to the area of search for the proposed substation where the corridors are closest to the corridor of the proposed 400kV overhead line and residential properties. Beyond the area of search for the proposed substation there are relatively few visual receptors.

8.54 The corridors are presented below in order of their level of overall environmental constraint together with the key reasons for the decision.

Corridor B

8.55 Based on the information available at this stage of assessment the least environmentally constrained option for a new 132kV overhead line connection between the area of search for the proposed substation and the AT Route overhead line is Corridor B. This route contains few environmental constraints that would influence routeing. Together with

Corridor A, it is the shortest route at approximately 2km and would facilitate the removal of approximately 1.2km of the existing 132kV AT Route overhead line from Puxton Moor SSSI and Wildlife Site. Further discussions would be required with Natural England and NSC to determine the potential effects of removing the 132kV overhead line from within the SSSI.

8.56 It is close to Rookery Farm East and Box Bush Stables, however this corridor passes closer to fewer properties than the other three corridors. It borders Towerhead Brook Wildlife Site however the Wildlife Site could be avoided and the width of the corridor offers opportunities to maximise the distance of an overhead line from the Wildlife Site.

8.57 The landscape is generally open with low hedgerows and intermittent hedgerow trees. However the presence of trees along tracks and around a small pond offer opportunities to minimise visual effects from properties. Careful consideration of the positions of the overhead line supporting structures would be required at the detailed routeing stage to minimise the creation of a 'wirescape' in this open landscape particularly as two wood pole lines would be needed and intervisibility between lines would occur. An overhead line supported on steel lattice pylons would increase intervisibility between this line and the new National Grid 400kV overhead line.

Corridor A

8.58 Corridor A has very few environmental constraints, only containing a small area of young woodland which could be avoided with an overhead line alignment. The landscape is relatively open with few trees or hedgerows to provide backgrounding. It passes close to three properties Rookery East Farm, Nye Farm and Nut Tree Farm although trees around property boundaries would help to filter views. The corridor is constrained between these properties and due to its proximity to the corridor of the proposed National Grid 400kV overhead line the lines would potentially contribute to a perception of a 'wirescape' in this landscape.

8.59 The corridor passes close to Nye Moat Scheduled Monument close to Nye Farm. Mature trees to the south of the Scheduled Monument would help to filter and screen views of a new overhead line and reduce effects on setting.

8.60 Across the majority of the route there is little mature vegetation, other than along ditches and rhynes and hedgerow trees within hedgerows. The majority of the line could be sited within farmland with only minimal loss of trees at some hedgerow crossings.

8.61 The northern edge of the corridor is immediately west of Puxton Moor SSSI and Wildlife Site although alignments could be achieved which avoid effects on this designation.

8.62 Corridor A is the same length as Corridor B but would only result in the removal of approximately 900m of the existing 132kV AT Route from Puxton Moor SSSI and Wildlife Site.

Corridors C and D

8.63 Corridors C and D represent the longest options and the most environmentally constrained corridors for a new overhead line connection between the area of search for the proposed substation and the AT Route overhead line. Both corridors cross Towerhead Brook Wildlife Site and a small tributary which forms part of the River Banwell Wildlife Site.

8.64 The corridors pass to the north and south of a Deserted Medieval Settlement Scheduled Monument. It is anticipated that significant adverse effects on the setting of the Monument could be avoided however; potential effects would require careful consideration as part of detailed routeing studies.

8.65 The corridors pass through similar farmland to Corridors A and B although generally tree cover is slightly greater providing opportunities for backgrounding in places. However they

pass close to a greater number of properties and through a landscape that does not currently contain any overhead lines.

8.66 Corridor D also passes immediately west of Stuntree Farm Grade II listed building and due to its proximity a new overhead line in this corridor could affect its setting.

8.67 Corridor C is 3km long and would result in the removal of approximately 2.3km of the AT Route overhead line. Corridor D is 3.5km long and would result in the removal of approximately 3km of the AT route overhead line. Corridor D provides the opportunity to remove the greatest length of the AT Route overhead line which would improve the nature of views for properties which currently experience views of the line. However, the improvement provided to the small number of properties close to the existing AT Route overhead line would need to be balanced against the visual effects of introducing new overhead lines into an area of the landscape that does not currently contain any existing electrical infrastructure.

8.68 Both Corridors C and D would offer the opportunity to maximise distances between an overhead line and the corridor of the proposed 400kV overhead line which would reduce the potential perception of a 'wirescape'. However, the corridors are not sufficiently separate from the AT Route and proposed 400kV line to prevent intervisibility. Overall, Corridors C and D do not provide any environmental benefit over Corridor A or B as they cross more environmental constraints and would be closer to a greater number of properties.

8.69 If underground cables were used for the connection between the proposed substation and the AT Route overhead line there would be little to distinguish between the corridors but Corridor D would be preferred over Corridors A, B and C as it would provide the opportunity to remove the greatest length of the existing AT Route overhead line (approximately 3km).

9.0 CONCLUSIONS

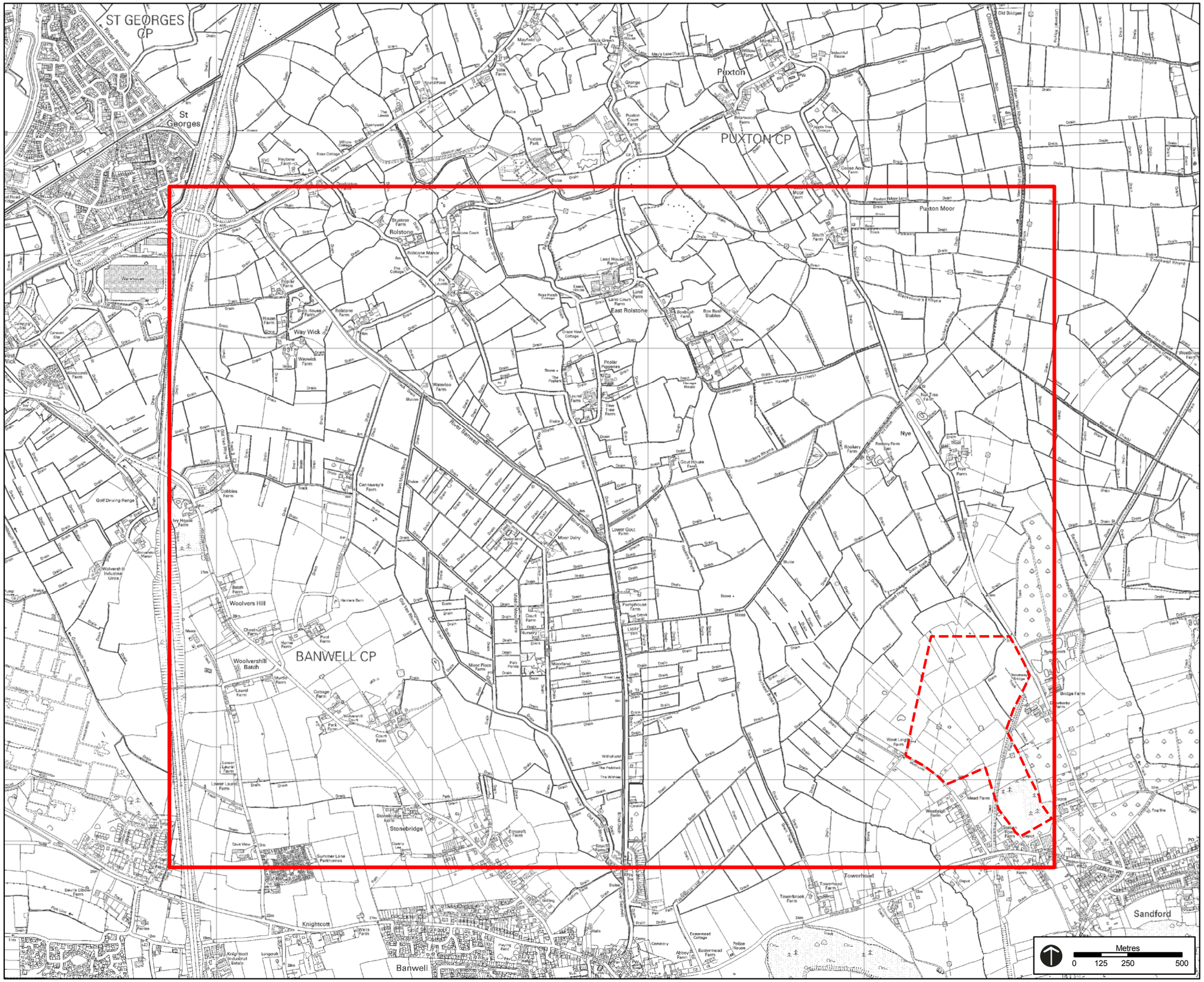
9.1 The assessment and comparison of corridors has been based on environmental considerations only. It does not take account of technical or economic factors or responses to consultation which will be taken into consideration by WPD before a preferred route corridor is identified to be taken forward.

9.2 This RCS has identified four broad route corridors for achieving a new 132kV double circuit connection between a proposed 400/132kV substation in the vicinity of Sandford and the existing 132kV AT Route overhead line. Based on the information available at this stage of assessment the least environmentally constrained corridor for a new overhead line connection is Corridor B as it contains few environmental constraints that would influence routeing and together with Corridor A is the joint shortest route at approximately 2km. This corridor would also facilitate the removal of approximately 1.2km of the AT Route overhead line.

9.3 Two single circuit wood pole lines are considered preferable to a double circuit steel lattice overhead line as the wood pole lines would be easier to assimilate into the landscape and would result in the least effect on views from residential properties. Paralleling of wood pole overhead lines along any corridor would increase the prominence of the overhead lines in the landscape. However, this would limit the landscape and visual effects to a localised area. This would be most preferable along Corridor B where fewer receptors would experience views of the new lines. An alternative option to minimise environmental effects would be to have one circuit supported on wood poles and one circuit underground along Corridors A or B. This would limit the amount of new infrastructure required and would limit effects on views.

9.4 The use of underground cables would be of greatest benefit close to the area of search for the proposed substation where the corridors are closest to the corridor of the proposed 400kV overhead line and residential properties. If underground cables were used for the entire connection between the proposed substation and the AT Route overhead line there would be little to distinguish between the corridors but Corridor D would be preferred over Corridors A, B and C as it would provide the opportunity to remove the greatest length of the existing AT Route overhead line (approximately 3km). If this option was taken forward the effects of routeing underground cables through the Towerhead Brook Wildlife Site would require consideration and assessment to ensure any effects on the flora and fauna could be avoided or appropriately mitigated.

FIGURE 1 – STUDY AREA



Key

Route Corridor Study Area

Area of search for 400/132kV GSP Substation Site

Note: Study area lies completely within North Somerset Council

Rev	Description	Drawn	Approved	Date
A	Shapefile amendments	CB	CC	29/03/12

TEP
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Project: **WPD Route Corridor Study**

Title: **Study Area**

Drawing No: Figure 1

Date: 01/03/12

TEP Ref No: 1979.03.073a

Drawn:	Checked:	Approved:
CB	CC	CC

FIGURE 2 – OVERHEAD LINE PYLON AND WOOD POLE ELEVATIONS

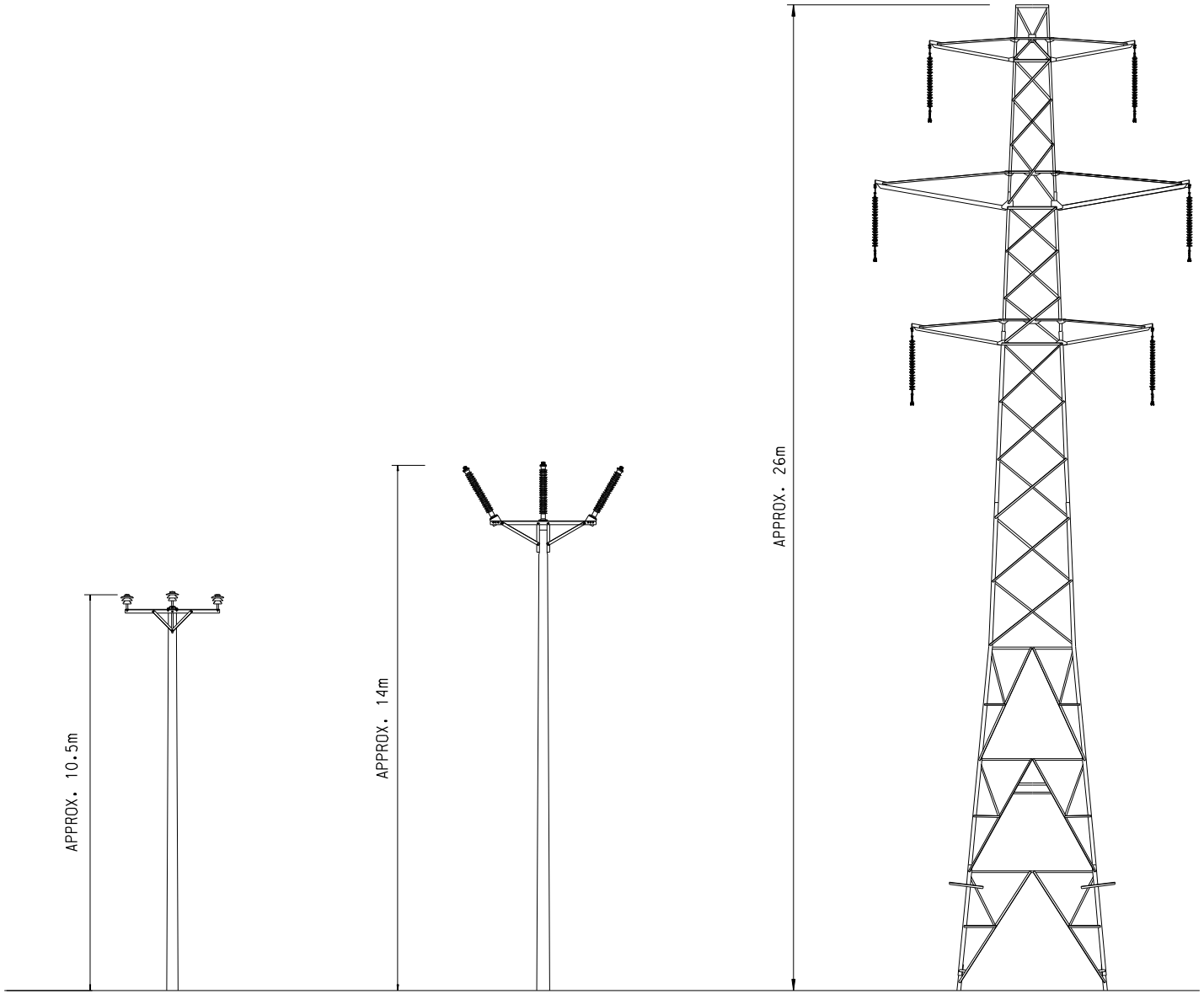
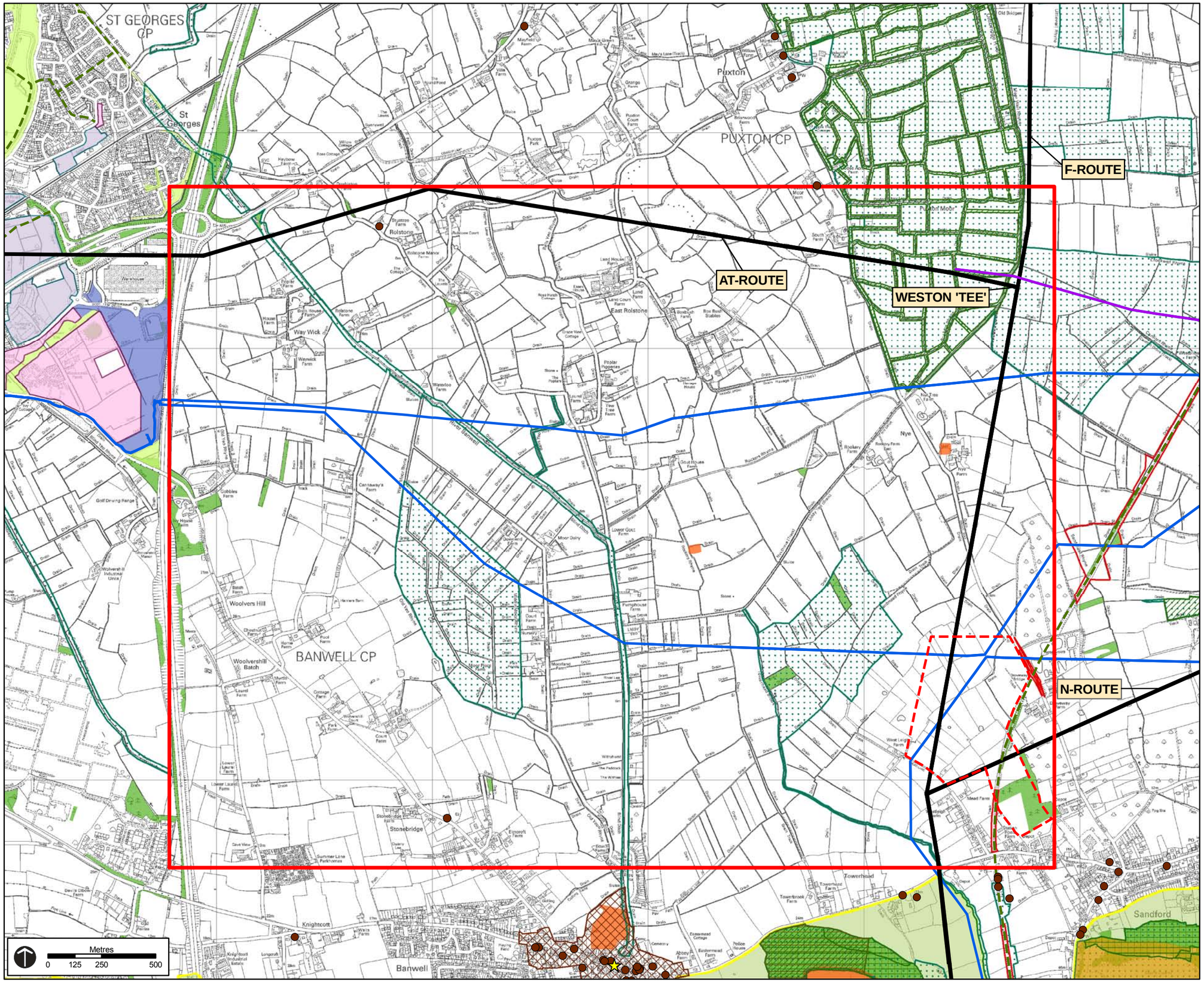

APPROX. 10.5m
APPROX. 14m
APPROX. 26m
33kV SINGLE CIRCUIT
INTERMEDIATE WOOD POLE
132kV SINGLE CIRCUIT
INTERMEDIATE WOOD POLE
132kV DUAL CIRCUIT
INTERMEDIATE STEEL TOWER

FIGURE 3 – ENVIRONMENTAL CONSTRAINTS



Key

Route Corridor Study Area

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing 33kV Overhead Line (On Wood Poles)
- 33kV Overhead Line (On Wood Poles - not currently in use)
- Area of search for 400/132kV GSP Substation Site

Environmental Constraints

- Area of Outstanding Natural Beauty
- Special Area of Conservation
- Site of Special Scientific Interest
- Site of Special Scientific Interest (Ditches and Rhynes)
- Scheduled Monuments
- Conservation Areas
- Listed Buildings (Grade I, II and II*)
- Woodland
- Ancient Woodlands
- Local Nature Reserves
- Wildlife Sites
- Strategic Cycle Routes
- Geological Site
- Housing Allocation
- Mixed Use Allocation
- Safeguarded Employment Area
- Safeguarded site for proposed strategic and structural open space

This map includes data from the following sources: - Western Power Indicative boundaries digitised from publically available information and local plans.

The following environmental constraints considered do not occur in the study area:
- National Parks
- World Heritage Sites
- Ramsar
- Special Protection Area
- Heritage Coasts
- Registered Battlefields
- Registered Parks and Gardens
- Areas of Archaeological Importance

Rev	Description	Drawn	Approved	Date
A	Shapefile amendments	CB	CC	29/03/12

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Project: **WPD Route Corridor Study**

Title: **Environmental Constraints**

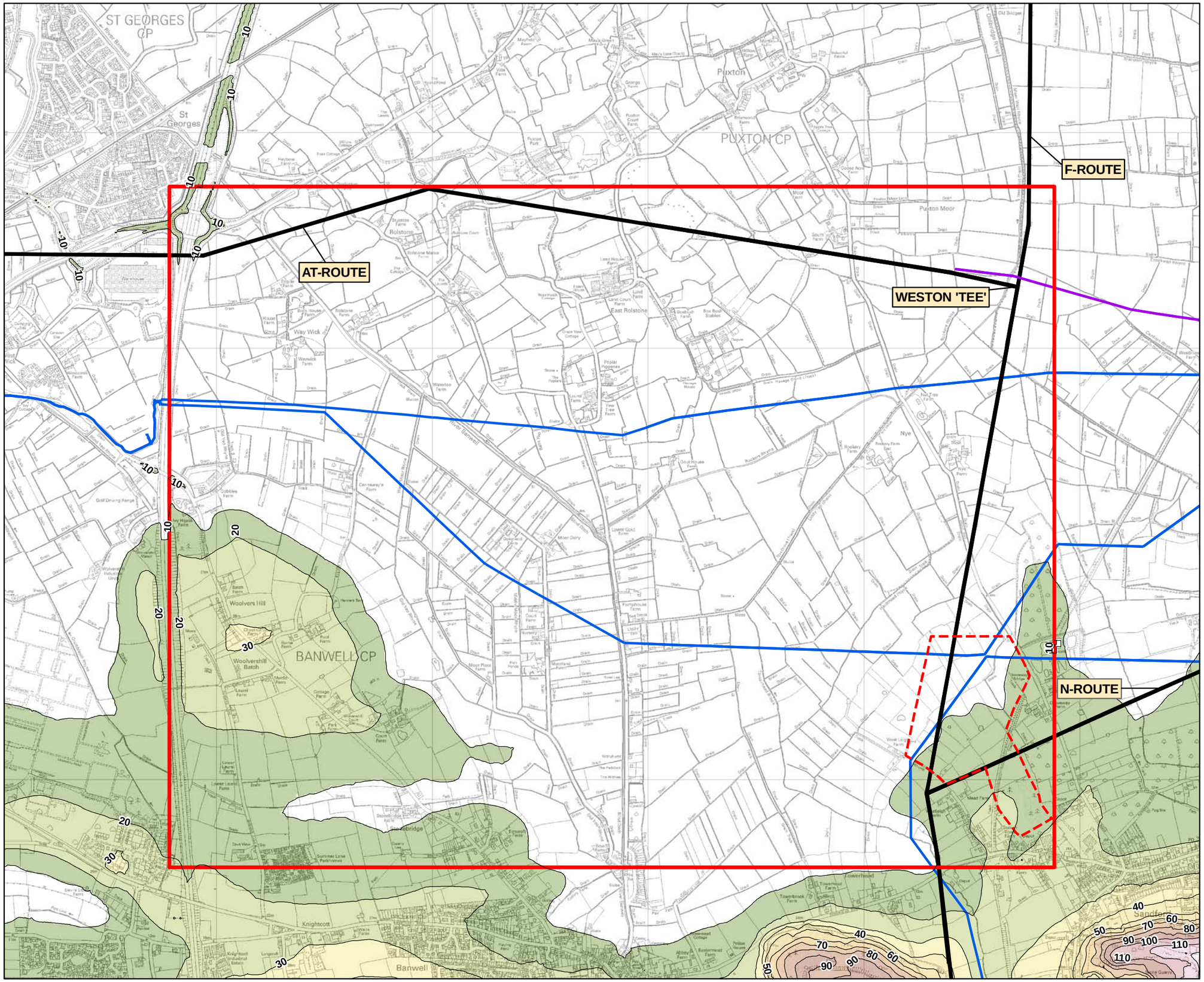
Drawing No: Figure 2

Date: 01/03/12

TEP Ref No: 1979.03.074a

Drawn:	Checked:	Approved:
CB	CC	CC

FIGURE 4 – TOPOGRAPHY



Key

Route Corridor Study Area

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing 33kV Overhead Line (On Wood Poles)
- 33kV Overhead Line (On Wood Poles not currently in use)
- Area of search for 400/132kV GSP Substation Site

Elevation (in metres)

- 120 - 130
- 110 - 120
- 100 - 110
- 90 - 100
- 80 - 90
- 70 - 80
- 60 - 70
- 50 - 60
- 40 - 50
- 30 - 40
- 20 - 30
- 10 - 20
- 0 - 10

Metres
0 125 250 500

Rev	Description	Drawn	Approved	Date
A	Shapefile amendments	CB	CC	29/03/12

TEP
Genesis Centre
Birchwood Science Park
Warrington WA3 7BH
Tel 01925 844004
Fax 01925 844002
email tep@tep.uk.com

Project: **WPD Route Corridor Study**

Title: **Topography**

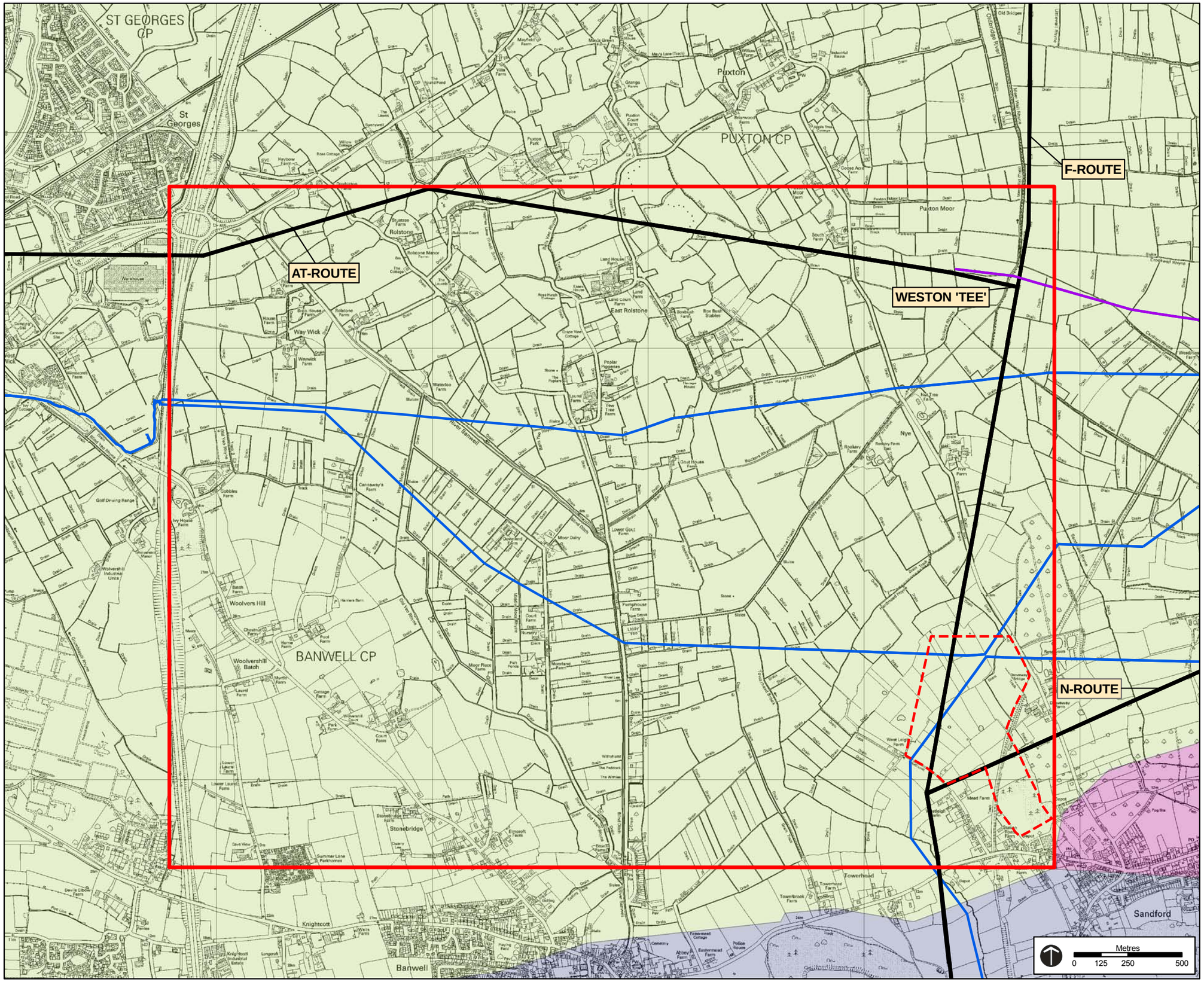
Drawing No: Figure 3

Date: 01/03/12

TEP Ref No: 1979.03.075a

Drawn:	Checked:	Approved:
CB	CC	CC

FIGURE 5 - NATIONAL LANDSCAPE CHARACTER ASSESSMENT



Key

Route Corridor Study Area

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing 33kV Overhead Line (On Wood Poles)
- 33kV Overhead Line (On Wood Poles - not currently in use)
- Area of search for 400/132kV GSP Substation Site

National Landscape Character Areas

- Somerset Levels and Moors
- Mendip Hills
- Bristol, Avon Valley and Ridges

Rev	Description	Drawn	Approved	Date
A	Shapefile amendments	CB	CC	29/03/12

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Project: **WPD Route Corridor Study**

Title: **National Landscape Character Assessment**

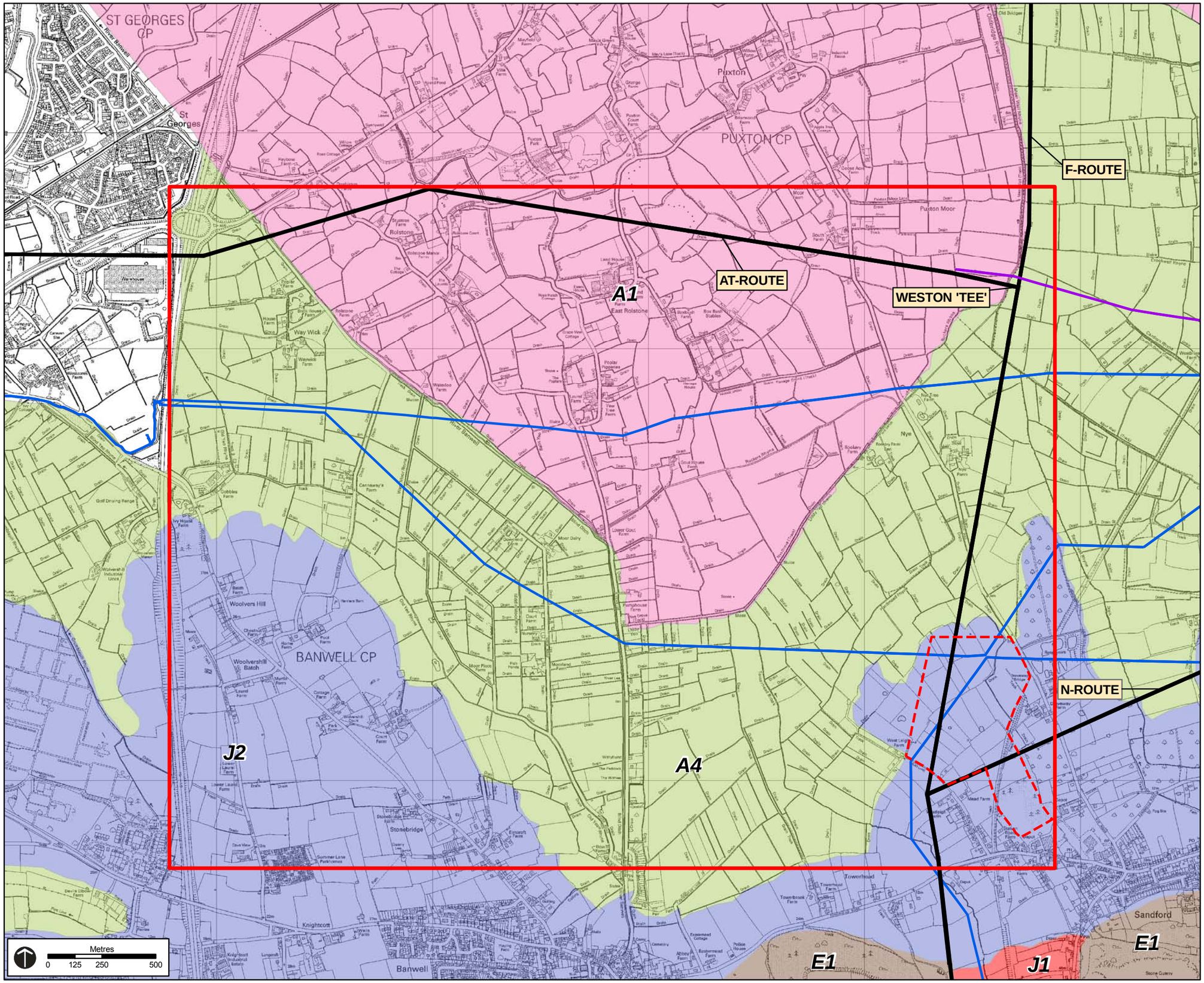
Drawing No: Figure 4

Date: 01/03/12

TEP Ref No: 1979.03.076a

Drawn:	Checked:	Approved:
CB	CC	CC

FIGURE 6 – LOCAL LANDSCAPE CHARACTER ASSESSMENT



Key

Route Corridor Study Area

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing 33kV Overhead Line (On Wood Poles)
- 33kV overhead line (On Wood Poles not currently in use)
- Area of search for 400/132kV GSP Substation Site

North Somerset Landscape Character Areas

- A1 - Kingston, Seymour and Puxton Moors
- J2 - River Yeo Rolling Valley Farmland
- A4 - Locking and Branwell Moors
- E1 - Mendip Ridge
- J1 - Lox Yeo Rolling Valley Farmland

Rev	Description	Drawn	Approved	Date
A	Shapefile amendments	CB	CC	29/03/12

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Project: **WPD Route Corridor Study**

Title: **Local Landscape Character Assessment**

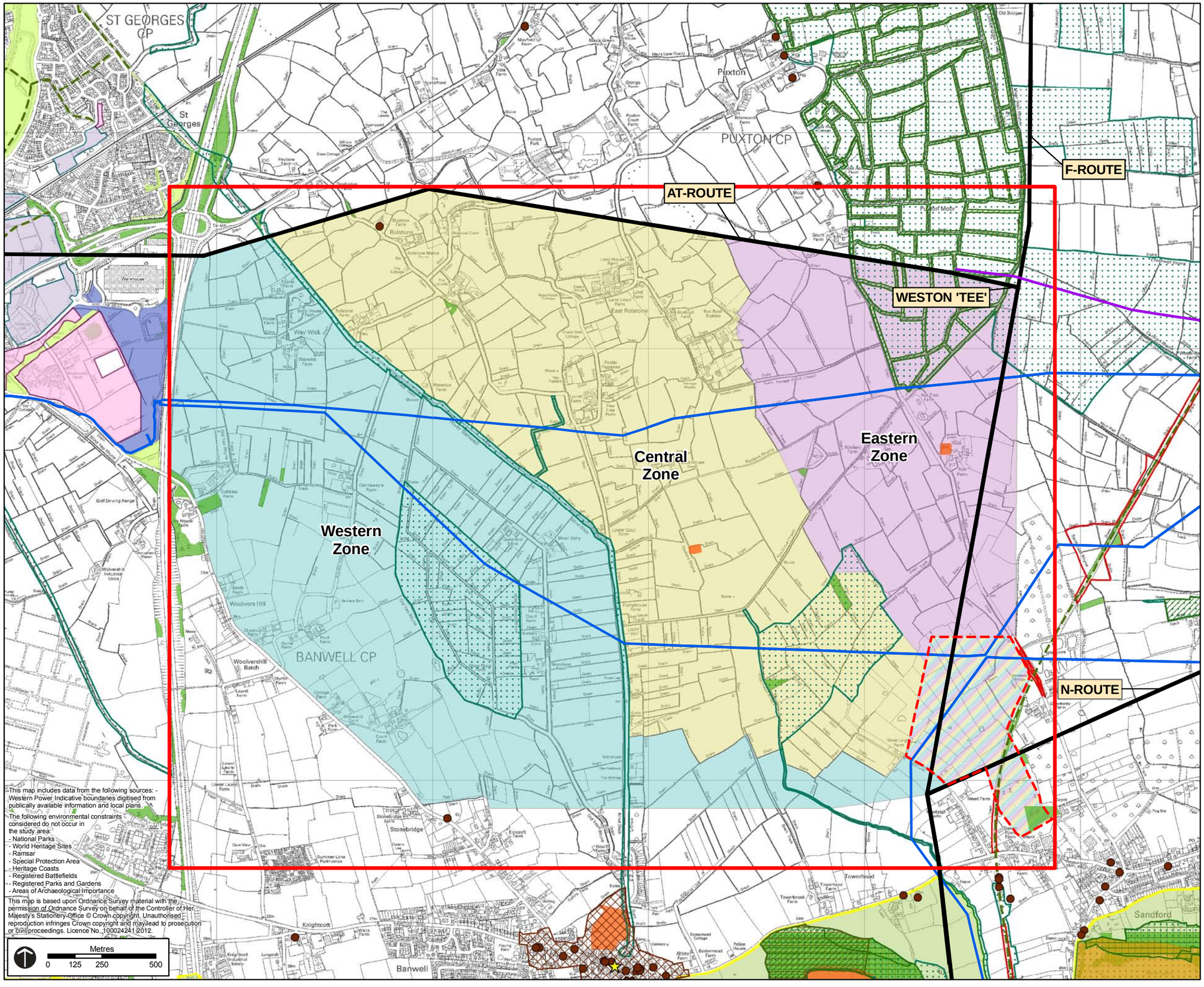
Drawing No: Figure 5

Date: 01/03/12

TEP Ref No: 1979.03.077a

Drawn:	Checked:	Approved:
CB	CC	CC

FIGURE 7 – ZONES OF INVESTIGATION



This map includes data from the following sources: - Western Power Indicative boundaries digitised from publically available information and local plans.

The following environmental constraints considered do not occur in the study area:
- National Parks
- World Heritage Sites
- Ramsar
- Special Protection Area
- Heritage Coasts
- Registered Battlefields
- Registered Parks and Gardens
- Areas of Archaeological Importance

Key

Route Corridor Study Area

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing 33kV Overhead Line (On Wood Poles)
- 33kV Overhead Line (On Wood Poles not currently in use)
- Area of search for 400/132kV GSP Substation Site

Zone of Investigation

- Eastern Zone
- Central Zone
- Western Zone
- Multiple Zones of Investigation

Environmental Constraints

- Area of Outstanding Natural Beauty
- Special Area of Conservation
- Site of Special Scientific Interest
- Site of Special Scientific Interest (Ditches and Rhynes)
- Scheduled Monuments
- Conservation Areas
- Listed Buildings (Grade I, II* and II)
- Woodland
- Ancient Woodlands
- Local Nature Reserves
- Wildlife Sites
- Strategic Cycle Routes
- Geological Site
- Housing Allocation
- Mixed Use Allocation
- Safeguarded Employment Area
- Safeguarded Site for Proposed Strategic and Structural Open Space

Rev	Description	Drawn	Approved	Date
A	Shapefile amendments	CB	CC	29/03/12

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Project: **WPD Route Corridor Study**

Title: **Zones of Investigation**

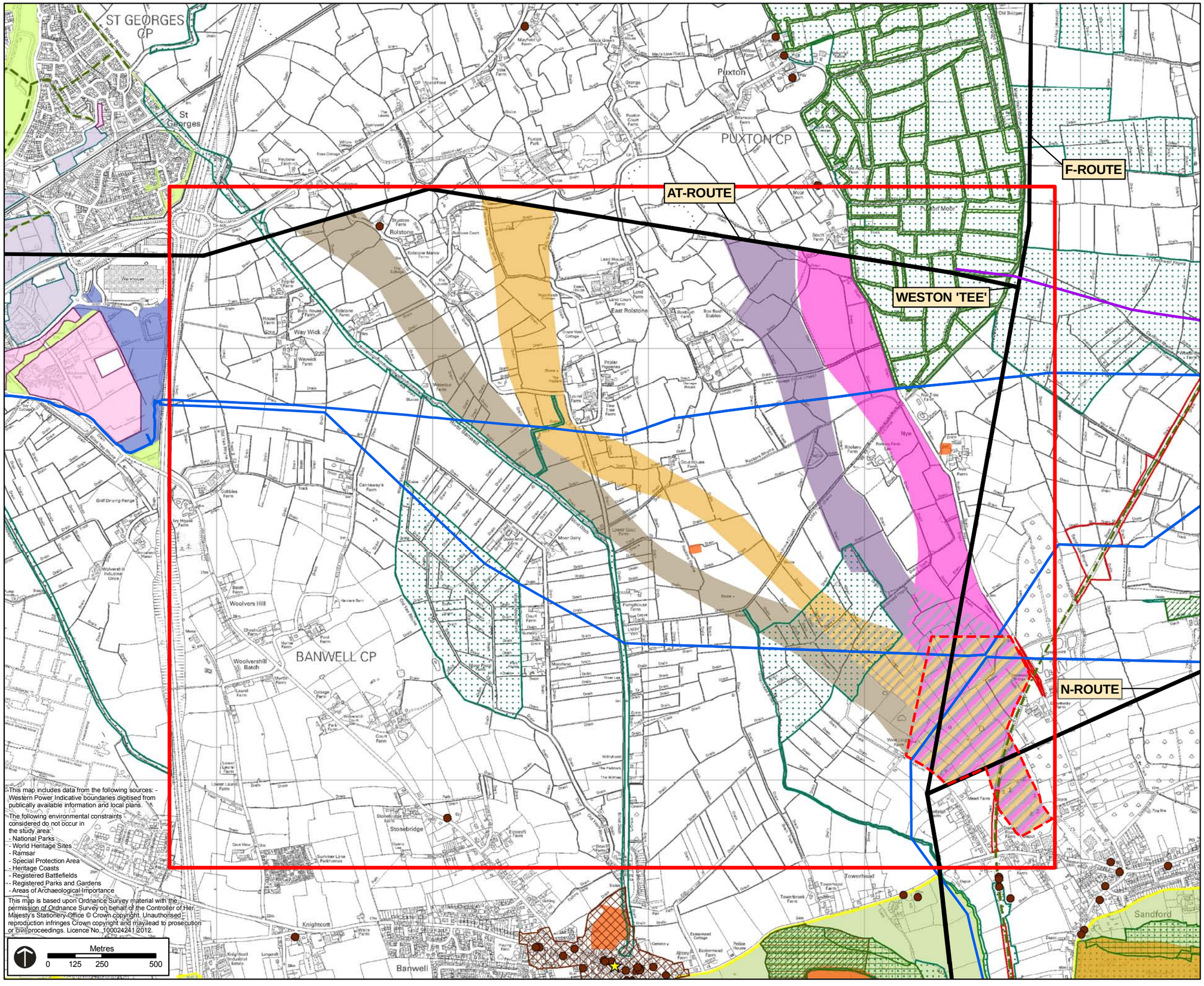
Drawing No: Figure 6

Date: 01/03/12

TEP Ref No: 1979.03.078a

Drawn:	Checked:	Approved:
CB	CC	CC

FIGURE 8 – ROUTE CORRIDORS



This map includes data from the following sources: -
Western Power Indicative boundaries digitised from publically available information and local plans.

The following environmental constraints considered do not occur in the study area:
- National Parks
- World Heritage Sites
- Ramsar
- Special Protection Area
- Heritage Coasts
- Registered Battlefields
- Registered Parks and Gardens
- Areas of Archaeological Importance

Metres
0 125 250 500

Key

- Route Corridor Study Area

Existing Infrastructure

- Existing 132kV Overhead Line (On Lattice Steel Towers)
- Existing 33kV Overhead Line (On Wood Poles)
- 33kV Overhead Line (On Wood Poles not currently in use)
- Area of search for 400/132kV GSP Substation Site

Route Corridors

- Corridor A
- Corridor B
- Corridor C
- Corridor D
- Multiple Corridors

Environmental Constraints

- Area of Outstanding Natural Beauty
- Special Area of Conservation
- Site of Special Scientific Interest
- Site of Special Scientific Interest (Ditches and Rhynes)
- Scheduled Monuments
- Conservation Areas
- Listed Buildings (Grade I, II* and II)
- Woodland
- Ancient Woodlands
- Local Nature Reserves
- Wildlife Sites
- Strategic Cycle Routes
- Geological Site
- Housing Allocation
- Mixed Use Allocation
- Safeguarded Employment Area
- Safeguarded Site for Proposed Strategic and Structural Open Space

Rev	Description	Drawn	Approved	Date
A	Shapefile amendments	CB	CC	29/03/12

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Project: **WPD Route Corridor Study**

Title: **Route Corridors**

Drawing No: Figure 7

Date: 01/03/12

TEP Ref No: 1979.03.079a

Drawn:	Checked:	Approved:
CB	CC	CC

APPENDIX 1 - WPD SCHEDULE 9 STATEMENT

WESTERN POWER DISTRIBUTION

Serving the South West and Wales

WESTERN POWER DISTRIBUTION
(South West) plc and (South Wales) plc

SCHEDULE 9 STATEMENT

This statement is provided under Schedule 9 of the Electricity Act 1989 as amended by the Utilities Act 2000

South Wales and the South West of England is renowned for its countryside, dramatic coastline and rugged terrain. Western Power Distribution (WPD) recognises that such an environment needs care and consideration and WPD aims to achieve this through its environmental policy.

Duties:- WPD is licenced to distribute electricity through its electricity systems in South West England and South Wales where the Company is the Distribution Licence holder. It is obliged, under its Licence, to offer least cost, compliant connections to persons seeking connections to the Distribution system within the Licence areas.

Under Schedule 9 of the Electricity Act, as amended, WPD must "have regard to the desirability" of preserving natural beauty and "seek to do what it reasonably can to mitigate" the effect of its activities on the countryside, geological and physiographical features, flora, fauna, and protect sites, buildings or structures or objects of historic or archaeological interest when WPD:-

- Plans to install electricity lines (overhead and underground) to supply an individual or community

- Carries out other works in connection with the operation and maintenance of the distribution system

WPD aims to: -

- Minimise the impact of its activities on communities and the historic and natural environment

- Site overhead lines with care and consider both the visual impact and the impact on nature conservation as far as possible

- Continue to work with partners to selectively underground lines in appropriate sensitive locations to improve the appearance of countryside, towns or villages, whilst taking account of sites of particular archaeological or nature conservation interest.

To do this, WPD : -

- Only seeks to build lines along new routes, or substations in new locations where the existing distribution system infrastructure cannot be economically upgraded to meet Distribution security standards, or where we foresee an increase in demand for electricity which will not be satisfied by other means, or where connections to customers are required.

- Will seek to avoid, where reasonably practicable, the installation of new infrastructure in areas which are nationally or internationally designated for their landscape, wildlife, historic or cultural significance: National Parks; Areas of Outstanding Natural Beauty; Sites of Special Scientific, Interest including Special Protection; Areas, Special Areas of Conservation and Ramsar sites; National Nature Reserves; Heritage Coasts; World Heritage Sites; scheduled ancient monuments and designated sites of historic interest . ("listed sites") . If installation on such listed sites is necessary, WPD will seek to avoid significant impacts on regional and local sites, protected species and to biodiversity and geological interests within the wider environment, and take measures to safeguard historic sites. Where reasonably practicable, opportunities to enhance biodiversity and geological features of such sites will be exploited.

- Will maintain a geographic record of the locations of the above "listed sites"

- Will seek specialist advice if it is necessary to undertake work on sites of archaeological, historical, biodiversity or geological interest, working closely with suitably qualified and experienced specialists.

- Will consult with District Councils for all new overhead lines. Where these involve voltages at 33kV and above we will voluntarily consult with Parish Councils. For 132kV overhead lines, we will, in addition to consulting with Parish Councils consult with County Councils as well.

- Will consult with Local Authorities on the need to undertake an environmental impact assessment when it is proposed to build more than 1km of new overhead line of 33kV and above

- Will review and offer comment on Local Authority long term plans to draw early attention to the needs for plans to consider strategic WPD infrastructure

- Will consult with statutory bodies, local authorities and relevant landowners where planned new construction would have a high amenity impact, to help us identify, assess and carry out measures to mitigate the impact so far as is reasonably practicable. This may include the provision of resources to screen and landscape selected substations and other locations as needs change.

- Will, on completion of any work ensure the site is reinstated, as far as possible, to its original state

- Will promote environmental awareness and requirement to comply with WPD policies to its staff and contractors. Where WPD staff are undertaking noise testing, we will ensure those staff are trained by recognised external bodies. We will voluntarily liaise with Local Authority Environmental Health Officers to discuss noise complaints and share test results with them.

- Will expect similar environmental standards from our suppliers and contractors. Where works are being undertaken by third parties for later adoption by WPD under the Ofgem Competition in Connections regime, we have sought through Ofgem that appropriate requirements are in place.

- Pursues waste minimisation, and recycling. WPD recycle office materials like glass, paper, card and toners, as well as metal materials, oils, wood and electrical equipment. Where possible we donate computers, office furniture and telephones that are no longer required by WPD to charitable organisations.

- Undertakes research, invests in and reviews new technology relevant to the business and takes into consideration its impact on the environment. Seeks to use technology to reduce the amount and size of equipment needed on site

- Take special care and appropriate safety measures in the handling and disposal of potentially hazardous materials

- Use external consultants where “in-house” expertise is not available

APPENDIX 2 - THE HOLFORD RULES

The Holford Rules

Guidelines on overhead line routeing were first formulated in 1959 by Sir William, later Lord, Holford, who was a part-time member of the CEGB. National Grid has reviewed these guidelines, known as 'the Holford Rules', and concluded that they have stood the test of time. National Grid therefore intends to continue to employ them as a basis of the company's approach to overhead line routeing.

Since the formulation of the original Rules, formal requirements for environmental assessment have been introduced. Whilst environmental assessment for overhead lines addresses wider topics than the visual amenity issue on which the Rules concentrate, they remain a valuable tool in selecting and assessing potential route options as part of the environmental assessment process. The original Rules and their added notes of clarification are set out below.

GUIDELINES FOR THE ROUTEING OF NEW HIGH VOLTAGE OVERHEAD TRANSMISSION LINES

Rule 1:

Avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.

Note on Rule 1

Investigate the possibility of alternative routes, avoiding if possible the areas of highest amenity value. The consideration of alternative routes must be an integral feature of environmental statements.

Areas of highest amenity value are:

Areas of Outstanding Natural Beauty
National Parks
Heritage Coasts
World Heritage Sites

Rule 2:

Avoid smaller areas of high amenity value, or scientific interests by deviation; provided that this can be done without using too many angle towers, ie the more massive structures which are used when lines change direction.

Note on Rule 2

Some areas (e.g. Sites of Special Scientific Interest) may require special consideration for potential effects on ecology (e.g. to their flora and fauna).

Where possible choose routes which minimise the effects on the settings of areas of architectural, historic and archaeological interest including Conservation Areas, Listed Buildings, Listed Parks and Gardens and Ancient Monuments.

Rule 3:

Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers.

Note on Rule 3

Where possible choose inconspicuous locations for angle towers, terminal towers and sealing end compounds.

Rule 4:

Choose tree and hill backgrounds in preference to sky backgrounds wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.

Rule 5:

Prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees.

Note on Rules 4 and 5

Utilise background and foreground features to reduce the apparent height and domination of towers from pan viewpoints.

Minimise the exposure of numbers of towers on prominent ridges and skylines.

Where possible avoid cutting extensive swathes through woodland blocks and consider opportunities for skirting edges of copses and woods.

Protect existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.

Rule 6:

In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concentration or 'wirescape'.

Note on Rule 6

In all locations minimise confusing appearance.

Arrange wherever practicable that parallel or closely related routes are planned with tower types, spans and conductors forming a coherent appearance; where routes need to diverge, allow where practicable sufficient separation to limit the effects on properties and features between the lines.

Rule 7:

Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the comparative costs of undergrounding, for lines other than those of the highest voltage.

Note on Rule 7

When a line needs to pass through a development area, route it so as to minimise as far as possible the effect on development.

Alignments should be chosen after consideration of effects on the amenity of existing development and on proposals for new development.

When siting substations take account of the effects of the terminal towers and line connections that will need to be made and take advantage of screening features such as ground form and vegetation.

SUPPLEMENTARY NOTES

Residential Areas

Avoid routeing close to residential areas as far as possible on grounds of general amenity.

Designations of County, District and Local Value

Where possible choose routes which minimise the effect on Special Landscape Areas, areas of Great Landscape Value and other similar designations of County, District or local value.

Alternative Tower Designs

In additional to adopting appropriate routeing, evaluate where appropriate the use of alternative tower designs now available where these would be advantageous visually, and where the extra cost can be justified.

APPENDIX 3 - SCHEDULE OF CONSULTATION RESPONSES

APPENDIX 3 – SCHEDULE OF CONSULTATION RESPONSES

Theme	Comments/Issues Raised	Authority/ Body	Response
Landscape	• The route corridors pass through three landscape character areas.	North Somerset Council	• Comments have been noted.
	• There would be significant landscape benefits in removing as many of the existing metal lattice towers from the AT Route as possible.	North Somerset Council	• Comments have been noted.
	• Undergrounding would offer a solution to impacts on views from the AONB and locally. • Detailed routing studies should consider which option causes the least harm to the landscape particularly hedges and trees.	North Somerset Council	• The exact technology option has not been decided at this stage. The use of underground cables would be of greatest benefit close to the area of search for the proposed substation where the corridors are closet to the corridor of the proposed 400kV overhead line and residential properties.
	• Careful study on the impacts of using timber poles would be required, particularly if two lines are required.	North Somerset Council	• Comments have been noted.
	• Impact on residences should be low. If however the impacts are deemed too significant upon further study, consideration should be given to crossing the River Banwell into the Western Zone.	North Somerset Council	• Comments have been noted.
Biodiversity	• If Corridor B is selected the precise route should avoid the area of Wildlife Site and provide a suitable buffer of at least 5 metres. • If Corridor A is selected the precise route should provide a suitable buffer of at least 5 metres away from the boundary of the SSSI and Wildlife Site.	North Somerset Council	• Comments are noted. Although the corner of Corridor B crosses the wildlife site the vast majority of the corridor avoids it. The corridor is also of sufficient width to allow the identification of alignments which avoid the wildlife site.
	• Concerns about the impacts on biodiversity during the construction phase.	Environment Agency	• An assessment of effects on ecology and biodiversity during the construction and operational phases of the development will be undertaken as part of the EIA.

Theme	Comments/Issues Raised	Authority/ Body	Response
	• The depth of underground cabling and method of installing needs due consideration in respect of biodiversity. • Need to demonstrate that the permanent works do not impact on the water levels in the watercourses as these are likely to have a direct link to the local interest features. • Need to ensure that cables are suitably below watercourse so that the permanent works does not produce heat or electromagnetic fields that would disturb fisheries interests.	Environment Agency	• At this stage the technology to be adopted for the 132kV connection has not been determined. If underground cables are used for the connection detailed consideration will be given to construction methods and potential effects on ecological receptors. • The potential for impacts to arise on local watercourses and biodiversity will be considered as part of the EIA.
	• Appropriate habitat surveys would need to be undertaken. Any loss in species rich habitats would need to be appropriately mitigated for.	Environment Agency	• A Phase 1 habitat survey will be undertaken across the preferred route corridor. If species rich habitats are lost as part of the Hinkley Point C Connection project, National Grid and WPD will consider a range of measures to mitigate potential effects to an acceptable level.
Archaeology & Built Heritage	• All four proposed corridors run through the Northmarsh. • A Roman and later prehistoric landscape lies over most of Northmarsh,	North Somerset Council	• Comments are noted.
	• Undergrounding would, in effect erase any archaeology over a corridor at least 65m wide. It may also have unforeseen effects on the degree of waterlogging.	North Somerset Council	• At this stage the technology to be adopted for the 132kV connection has not been determined. If underground cables are used for the connection detailed consideration will be given to construction methods and potential effects on archaeology and the historic environment.
	• While recognising that the footprint of the proposed new lines will be relatively small, the effect of the engineering works, track laying, contractors compounds and so on will be significant.	North Somerset Council	• The impacts of the new infrastructure and associated construction works will be considered as part of the EIA.

Theme	Comments/Issues Raised	Authority/ Body	Response
	• Removing lines will almost certainly increase the damage caused by putting posts/towers in in the first place.	North Somerset Council	• If some of the existing 132kV overhead line between Weston-super-Mare and the Weston tee was removed as part of the proposed connection careful consideration would need to be given to environmental effects of this decommissioning. However, one possible option would be to remove the lattice steel towers but leave the concrete base of the towers in situ.
	• Corridor A crosses the side of the 'island' at Rookery Farm, Nye, where enhanced archaeological potential should exist. • Also crosses two parish boundaries, and a number of major palaeochannels, including that of the Ture broc, referred to in the 1068 charter of Compton Bishop. • Lidar data shows five major channels within Corridor A.	North Somerset Council	• Comments are noted.
	• Corridor B runs across the Northmarsh, with all the waterlogging implications. • One Roman site falls within the corridor and a second is immediately to the west and may extend into Corridor B. • Lidar data shows Corridor B encounters the same five major palaeochannels as Corridor A.	North Somerset Council	• Comments are noted.
	• A number of archaeological sites are known within Corridor C, including: Group of five contiguous ditched enclosures; House platforms at Gout House Farm; Site of 'The Rolestone', West Rolstone Road; James Exon's house, Rolstone; Site of Wood's house, 1815 • Lidar data shows the route crossing a number of large palaeochannels in its southern reach. • In addition, a number of small contiguous enclosures west of Gout House Farm are reminiscent of a shrunken settlement.	North Somerset Council	• Comments are noted.

Theme	Comments/Issues Raised	Authority/ Body	Response
	• Corridor D has more Historic Environment Record Sites within it than the alternatives, including: Roman pottery scatter, S of Gout House Farm; Cattle rubbing stone, Nye Drove; Lower Gout Farm, Banwell; Lower Gout Farm, Riverside; 'Catworthy' field names, Nye; 'Castle Moor' field name, Banwell Moor. • Also runs close to the Scheduled Monument at Gout House Farm, and would have some effect on its setting.	North Somerset Council	• Comments are noted.
	• All four proposed lines run through the area known as Northmarsh, an area of waterlogged peats and clays potentially preserving organic materials. • Concerns that undergrounding have a potentially harmful impact on these deposits.	English Heritage	• Comments are noted. • At this stage the technology to be adopted for the 132kV connection has not been determined. If underground cables are used for the connection detailed consideration will be given to construction methods and potential effects on ecological receptors
	• Concerns with the effect of the other associated works of the corridors. • The study does not provide enough comprehensive information to allow an assessment to be made of the impacts on the historic environment.	English Heritage	• Comments are noted. • The Route Corridor Study is a high level appraisal and as such it would be difficult and impractical to undertake a meaningful assessment of potential effects on the historic environment. To allow the accurate assessment of effects a specific route alignment and pylon positions would be required. We are of the view that we have sufficient technical and environmental information available to allow us to differentiate between the route corridors. The assessment of effects on the historic environment will form an important part of our Environmental Impact Assessment (EIA).

Theme	Comments/Issues Raised	Authority/ Body	Response
	• Request for a Visual Impact Assessment (VIA) be provided for all the following scheduled monuments: Dolebury Camp, Star Roman Villa, Wimblestone, and Banwell Camp – all on the Mendips and Nye Farm, Drove Way (Moated Site), Nye	English Heritage	• Comments have been noted. • The Route Corridor Study is a high level appraisal and as such it would be difficult and impractical to undertake a visual impact assessment for the Scheduled Monuments identified. To allow the accurate assessment of effects a specific route alignment and pylon positions would be required. We are of the view that we have sufficient technical and environmental information available to allow us to differentiate between the route corridors. The assessment of effects on landscape and views and the historic environment will form an important part of our Environmental Impact Assessment (EIA).
	• Concern over the close proximity of Option 4 to the Scheduled Monument at Gout House Farm and the likely impact upon its setting. • This will also require a detailed VIA together with a scheme of mitigation if this route is chosen.	English Heritage	• Comments have been noted. The proximity of Corridor D to the Scheduled Monument at Gout House Farm was considered as part of the Route Corridor Study. • Comments have been noted
	• Questioning whether consideration has been given to Registered Historic Parks and Gardens within the Corridor.	English Heritage	• Registered Parks and Gardens were considered as part of the Route Corridor Study. There are no Registered Parks and Gardens present within the study area for the proposed connection.
Water Environment	• Guidance stipulates that at least a five metre strip and sometimes a 10 metre strip for all water courses, hedges and woodlands should be retained to allow for management. • Where the Internal Drainage Board maintains the rhynes, an eight metre maintenance strip must be included.	North Somerset Council	• Comments have been noted.
	• Consideration needs to be given to the construction method to ensure that the works do not impact on flood risk.	Environment Agency	• Comments have been noted.

Theme	Comments/Issues Raised	Authority/ Body	Response
	• The siting of individual pylons needs to ensure that there is suitable access and clearance to maintain any watercourses.	Environment Agency	• Comments have been noted.
	• If watercourse crossing is via open cut trenching method then detailed consideration needs undertaking on how normal and flood flows are managed through the duration of the works. • These will also require prior Flood Defence Consent from the appropriate body.	Environment Agency	• Comments have been noted.
Construction	• Investigation work should look at different construction techniques to ensure that the most appropriate method, for the local environmental constraints is used	Environment Agency	• Comments have been noted.
	• Consideration needs to be given to the specific location of pylons at the earliest stage to avoid disturbance of he most important habitats. • Impacts on habitats impacts are most likely to come during the construction phase rather than post construction.	Environment Agency	• An assessment of effects on ecology and biodiversity during the construction and operational phases of the development will be undertaken as part of the EIA.
Access	• Consideration needs to be given to access arrangements as well as the physical corridor of the cables.	Environment Agency	• At this stage the technology to be adopted for the 132kV connection has not been determined. If underground cables are used for the connection detailed consideration will be given to construction methods and potential effects of access routes.

Appendix 2P – Hinkley Point C Connection Project Local Electricity Network Preferred Options Report (2012)

nationalgrid

October 2012

Hinkley Point C Connection Project

Local Electricity Network Preferred Options Report

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APPENDICES

LIST OF FIGURES

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1 INTRODUCTION

Purpose of report

1.1 This report has been prepared jointly by Western Power Distribution (South West) Limited (WPD) and National Grid Electricity Transmission Limited (National Grid).

1.2 In September 2007, National Grid received an application from British Energy Generation Limited (now part of EDF Energy) for the connection of a new nuclear power station at Hinkley Point, Somerset (Hinkley Point C) to the National Electricity Transmission System (NETS). National Grid subsequently identified the need for the construction of a new 400kV connection between Bridgwater and Seabank substation near Avonmouth.

1.3 To accommodate this new 400kV connection, National Grid is proposing to use the route corridor occupied by an existing 132kV overhead line (F-Route[1]) which would be removed between Bridgwater and Avonmouth substations. The removal of the existing WPD 132kV overhead line would disconnect the Churchill and Weston Bulk Supply Points [2] (BSP). These BSPs provide the electricity supply to local towns and villages as well as Bristol Airport.

1.4 Alternative locations have been considered for a substation site to accommodate both a new WPD BSP and a National Grid owned Grid Supply Point[3] (GSP) together with a route corridor for the associated 132kV connection. This 132kV connection is required to connect the substation with the existing AT-Route [4] overhead line which supplies Weston-super-Mare (AT-Route) or Weston BSP. In this report the term 'substation' incorporates both BSP and GSP. The proposed new substation and 132kV connection are referred to as the Local Electricity Network (LEN) Project.

[1] The F-Route is the term used to describe the section of 132kV circuit that runs between Bridgwater and Avonmouth substations
[2] A Bulk Supply Point (BSP) is a local substation operated by the Distribution Network Operator (e.g. Western Power Distribution) at which incoming voltages of 132kV are stepped down to 33kV or 11kV for distribution within local areas.
[3] A Grid Supply Point (GSP) is a substation at which the connection is made between the GB transmission system and the distribution network.
[4] The AT-Route is the term used to describe the section of 132kV circuit which runs between the Weston 'Tee' Pylon on the F-Route and Weston substation (BSP).

1.5 This report explains how representations to the summer 2012 consultation, National Grid's and WPD's duties and guidance, planning, socio-economic, technical and cost issues have been used in reaching a decision on the preferred location for the substation and the preferred route corridor to accommodate the 132kV connection between the new substation and the existing AT-Route overhead line.

1.6 This report will form background information in support of an application for an Order granting Development Consent (DCO).

1.7 The construction of a new 132kV overhead line is classified as a nationally significant infrastructure project (NSIP) under the Planning Act 2008[5] for which a DCO application is required.

1.8 Although the 132kV overhead line is a NSIP in its own right it will be included together with the proposed substation development under 'associated development' within the DCO for the Hinkley Point C Connection Project which will be submitted to the National Infrastructure Directorate within the Planning Inspectorate (PINS) in 2013.

1.9 The proposed LEN Project along with the construction of a new 400kV connection between Bridgwater and Seabank, will be assessed by the Planning Inspectorate and a recommendation made to the Secretary of State (SoS), using the criteria on national need, benefits and impacts set out in the National Policy Statements (NPS).

Structure of report

1.10 The report is structured as follows :

- Chapter 2 - sets out the background to the LEN Project proposals;
- Chapter 3 – summarises the findings of the Distribution System Options Report (DSOR)[6], Substation Siting Study[7] (SSS) and Route Corridor Study[8] (RCS). This chapter also explains other factors which were considered in reaching a preferred location for a new substation including technical complexity, cost, planning policy and socio-economic effects;
- Chapter 4 – considers the representations received from the summer 2012 consultation on the proposed Local Electricity Network Project;

[5] Planning Act: 2008: Ch. 29
[6] National Grid & Western Power Distribution: Distribution System Options Report: May 2012
[7] TEP: Churchill/Sandford Grid Supply Point Substation Siting Study for Public Consultation: May 2012
[8] TEP: Western Power Distribution 132kV Route Corridor Study for Public Consultation: May 2012

- Chapter 5 considers the four possible route corridors for a new 132kV connection (as discussed in the RCS) and explains how these options were tested against various factors including:
    - Duties under Section 9 of the Electricity Act[9] (including capital and lifetime costs)
    - Technical Complexity;
    - Planning Policy;
    - National Grid and WPD duties under Schedule 9 to the Electricity Act 1989; and
    - Land Use and Socio-Economic Factors
- Having identified the Preferred Area of Search (AoS) for the new substation and the route corridor to accommodate the 132kV connection, the next step was to assess potential locations within the AoS for the substation. Chapter 6 – summarises the findings of a Substation Siting Appraisal[10] (SSA) and then tests the least environmentally constrained zone for the siting of a substation identified in the SSA against: technical viability, planning policy, cost, socio-economics and relevant guidance.
- Chapter 7 – Sets out the next steps in the process.

[9] Electricity Act: 1989: Ch 29
[10] TEP: West of Nye Road Substation Siting Appraisal: October 2012

2 BACKGROUND TO THE PROPOSALS

Need for the Local Electricity Network Project

2.1 National Grid is legally obliged to provide connections to the transmission system for new power generators, including the proposed new Hinkley Point C nuclear power station. National Grid's current signed connection agreements are set out in the Need Case for the South West and the South Wales and Gloucestershire Regions report[11].

2.2 The existing National Grid transmission network in the South West is not designed to facilitate the amount of new generation proposed and requires additional capacity in order to maintain security of supply. Having examined a number of different options, National Grid concluded that the best way of providing sufficient capacity is by providing a new 400kV connection between Bridgwater and Seabank substation near Avonmouth.

2.3 In September 2011, National Grid announced that its preferred connection option was for an mainly overhead line route between Bridgwater and Seabank, predominantly using the corridor occupied by an existing 132kV overhead line (F-Route), owned and operated by WPD, which would be dismantled and removed between Bridgwater and Avonmouth substations.

2.4 The removal of the Western Power Distribution (WPD) 132kV overhead line disconnects the local electricity supply to consumers in the Weston-super-Mare and Churchill areas. As a result, works are required by National Grid and WPD to restore supplies to the electricity distribution system in these areas.

2.5 Working with WPD, National Grid has undertaken further work to consider options for the restoration of these supplies. This is documented in the Distribution System Options Report (DSOR) which concludes that a new substation in close proximity to the proposed new 400kV transmission circuit best meets a range of technical, economic and environmental criteria and should, therefore, be taken forward for further investigation. This substation would be connected to the proposed 400kV connection between Bridgwater and Seabank and also to the 132kV local distribution network. These works are

[11] National Grid: Hinkley Point C Connection Project, Need Case for the South West and the South Wales and Gloucestershire Regions: October 2012

referred to as the Local Electricity Network (LEN) Project which forms part of the Hinkley Point C Connection Project.

2.6 A Substation Siting Study (SSS) and Route Corridor Study (RCS) were undertaken to identify and appraise potential sites for the proposed new substation and potential route corridors for a 132kV connection from the new substation to the existing distribution network.

2.7 To take these studies forward to the next stage of assessment, National Grid and WPD must be mindful of their duties under the Electricity Act and of other guidance documents. These are introduced briefly below.

The duties of Western Power Distribution and National Grid

2.8 Section 9 of the Electricity Act 1989 requires National Grid and WPD to develop the transmission and distribution systems in an efficient, coordinated and economical manner.

2.9 In order to meet this statutory obligation, National Grid and WPD seek to make the most efficient use of its existing infrastructure by measures such as managing power flows and investing in upgrading existing connections and substations, before considering investment in new connections. They then consider the implications for efficiency, co-ordination and cost effectiveness in evaluating a range of options in its strategic decision making. The lowest cost solutions are not always adopted, as other considerations, such as environmental impacts, may favour alternative solutions therefore a balance needs to be struck.

2.10 Under section 38 of the Electricity Act 1989, both National Grid and WPD have a duty, when putting forward proposals for new development, to consider the preservation of amenity, including the natural environment, cultural heritage, landscape and visual quality. Appendix 1 of this report includes the 'Western Power Distribution and National Grid Role and obligations' which are to be followed when considering the siting and installation of new infrastructure.

National Grid Guidance

2.11 In its Stakeholder, Community and Amenity policy[12], National Grid sets out how the company will meet the duty placed upon it by the aforementioned legislation. This includes:

- only seeking to build new lines and substations where the existing transmission infrastructure cannot be upgraded to meet transmission security standards;
- seeking to avoid nationally and internationally designated areas where new infrastructure is required; and
- minimising the effects of new infrastructure on other sites valued for their amenity.

2.12 The Stakeholder, Community and Amenity Policy also commits to applying best practice methods, assessing the environmental impacts of proposals and identifying appropriate mitigation measures, and to promoting effective stakeholder and community engagement.

Holford Rules and Horlock Rules

2.13 Specific guidance for overhead line routeing was formulated by the late Lord Holford and published in 1959 by the Royal Society of Arts. These rules, known as the 'Holford Rules',[13] were reviewed by National Grid in 1992 and have become accepted within the electricity industry as the basis for overhead line routeing. Their use is supported in National Policy Statements[14] relating to major infrastructure.

2.14 The Horlock Rules[15] set out National Grid's approach to substation siting and design in the context of the company's duties under Schedule 9 of the Electricity Act.

[12] National Grid plc : National Grid's commitments when undertaking works in the UK - our Stakeholder, Community and Amenity Policy : February 2010
[13] National Grid: The National Grid Company plc and new high voltage transmission lines – guidelines for line routeing (the Holford Rules) and undergrounding
[14] National Policy Statements (NPSs) are produced by Government. They include the Government's objectives for the development of nationally significant infrastructure
[15] National Grid: The National Grid Company plc. NGC Substations and the environment: Guidelines on setting and design: March 2003

2.15 Both the SSS and the RCS explain how these rules were applied when considering locations for the siting of the new infrastructure.

3 LOCAL ELECTRICTY NETWORK PROJECT

Introduction

3.1 This chapter provides an overview of the documents produced by National Grid and WPD prior to the summer 2012 consultation. It also confirms the selection of the preferred area of search for the proposed substation.

3.2 In considering options throughout this process, National Grid has addressed in particular, those topics which may assist in determining which of the options under consideration should be taken forward. In the case of the LEN Project those topics material to decision-making have been identified as environmental factors (landscape/visual amenity, ecology and historic environment), socio-economic factors, cost and planning policy.

Initial Options Appraisal and Engagement

3.3 The Distribution Systems Options Report (DSOR) was produced by National Grid and Western Power Distribution (WPD) to consider the various options for maintaining supplies to the local distribution network once the existing F-Route overhead line between Bridgwater and Avonmouth substations is removed.

3.4 The DSOR concluded that the option to build a new substation in close proximity to the proposed 400kV transmission circuit (within the Sandford/Churchill Area) best meets a range of technical, economic and environmental criteria and should, therefore be taken forward for further investigation. Following on from the selection of this preferred technical option, two studies were produced. The first of these studies, the Substation Siting Study (SSS), sought to identify the least environmentally constrained [16] Area of Search (AoS) within which a substation could be sited. The second of these studies, the Route Corridor Study (RCS), sought to identify and assess potential route corridors for a new 132kV connection, between the least environmentally constrained AoS and the existing AT-Route overhead line that connects to Weston substation.

[16] The term least environmentally constrained is used in both the Substation Siting Study and Route Corridor Study and means an area of land or corridor of land that offers the best opportunity to avoid important environmental areas, such as known wildlife sites and archaeology.

3.5 National Grid and WPD engaged with the following organisations to obtain technical feedback and guidance on the draft versions of the DSOR, SSS and RCS prior to public consultation:

- North Somerset Council (NSC);
- Natural England (NE);
- English Heritage (EH); and
- Environment Agency (EA).

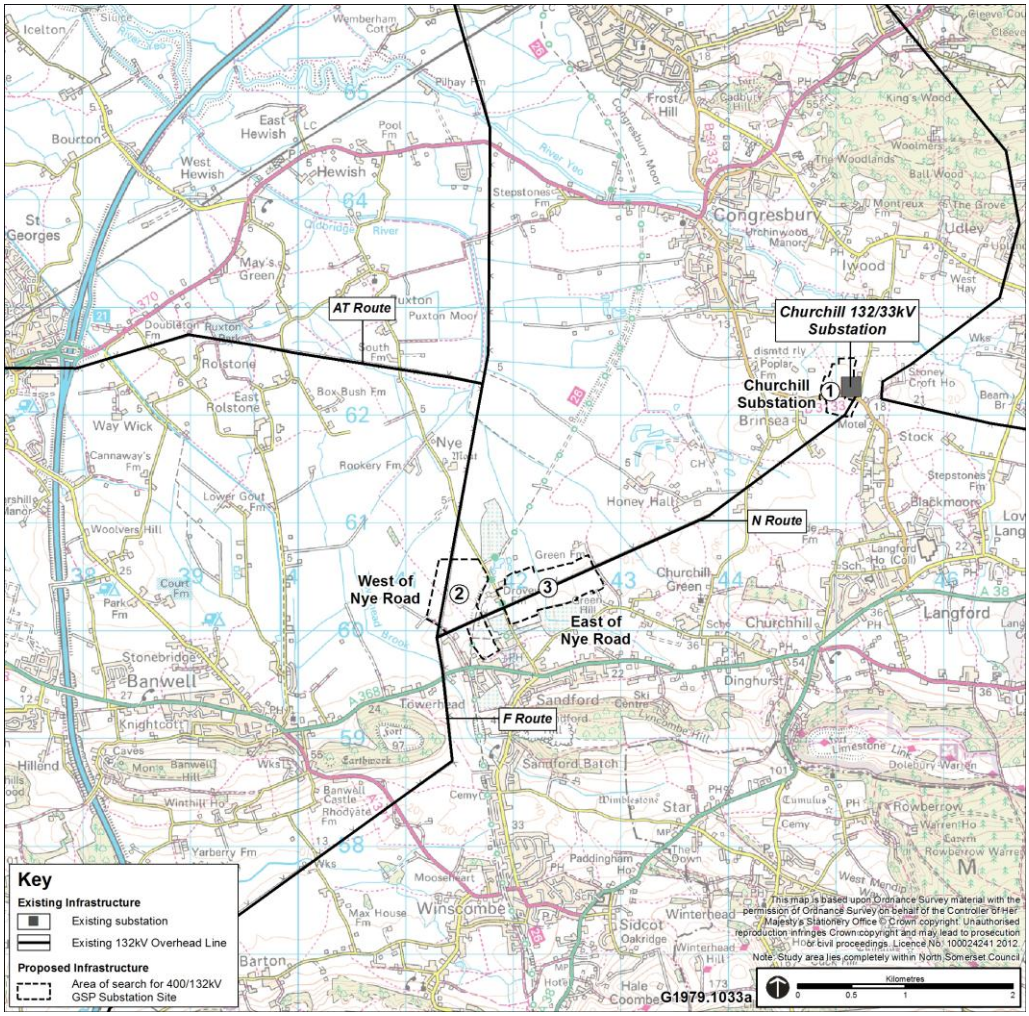
3.6 These organisations were invited to two meetings on the 16th January 2012 and 2nd April 2012. Feedback was received on each draft document and is included as an appendix within the relevant document.

Substation Siting Study (SSS)

3.7 The SSS identified three possible Areas of Search (AoS) to site a new substation in the Churchill/Sandford area. It assessed them against high level environmental and planning constraints with the aim of identifying the least environmentally constrained option. The operational requirements of a substation such as technical design, layout parameters and access were factors in the location selection process.

3.8 The three AoS options which were assessed as part of the SSS are illustrated in Figure 1 below.

Figure 1: Areas of Search for a new substation at Churchill/Sandford



NTS

3.9 AoS 1 includes an area of land surrounding the existing WPD 132kV Churchill substation. One of the main opportunities associated with this AoS was that the area is already influenced by electrical infrastructure and the new substation would be consistent with this existing character. However, a substation in this location would require the installation of a new 400kV connection of approximately 4.5km between the substation and the proposed Bridgwater – Seabank 400kV connection.

3.10 AoS 2 includes an area of land to the west of Nye Road adjacent to the preferred route corridor for the 400kV Bridgwater to Seabank connection. The SSS confirmed that this AoS would minimise the extent of new connections and no new 400kV connections would be required with this option. The SSS also confirmed that access to this AoS for Abnormal Indivisible Loads (AILs) is constrained.

3.11 AoS 3 covers an area of land to the east of Droveway Farm and Nye Road, beneath the existing 132kV N-Route[17] overhead line to the north of the A368. Adjacent to this AoS are agricultural units, large buildings and a range of settlement lagoons and reservoirs associated with the Thatcher's Cider factory. This location was relatively unconstrained by planning and environmental designations however it would require installation of short section of new 400kV double circuit connection (approximately 1km) to replace part of the existing 132kV N-Route. It was considered that a new substation in this location and its associated 400kV connection would be visually prominent from the Mendip Hills Area of Outstanding Natural Beauty (AONB) as the location is in 'deeper' open countryside in the sensitive Moors Landscape Character area.

3.12 The SSS concluded that AoS 2 (west of Nye Road) was the least environmentally constrained option as it is the only option that requires no additional 400kV connections. Constructing the substation in this area is anticipated to minimise the overall scale and extent of development within the open countryside and confine it to a more localised area adjacent to the corridor of the proposed 400kV Bridgwater to Seabank connection.

3.13 This report now considers the findings of the SSS against other factors, including technical complexity, cost (in the context of National Grid's and WPD's duties under the Electricity Act), planning policy and socio-economic effects.

Substation Area of Search - Technical Complexity

3.14 Having completed the SSS the identified AoS were assessed against technical complexity and cost in order to select the preferred substation AoS. From a technology perspective there are no differentiating technical issues as both National Grid and WPD have extensive experience of design, construction and operation of substations.

3.15 However, each AOS has a different length of 400kV connection associated with it which affects the costs of each option as shown below.

[17] The N-Route is the term used to describe the section of the 132kV connection between Churchill substation and the existing F-Route.

Substation Area of Search – Duties under Section 9 of the Electricity Act

3.16 Section 9 of the Electricity Act 1989 places an obligation on National Grid and WPD to develop and maintain "an efficient, co-ordinated and economical" system of electricity transmission/distribution. These obligations were also considered when selecting a preference for the AoS for new substation.

3.17 All three of the AoS could accommodate a substation which would be system compliant and efficient both in terms of individual scheme performance and the operation of the wider electricity transmission network (taking National Grid and WPD operations into account).

Capital Cost Estimates

3.18 Based on the level of information available at this stage, the relative capital costs of the substation options are shown in Table 1 below. The costs have been provided as a range because they include both overhead and underground options for associated 132kV connections (as identified in the DSOR).

3.19 A full breakdown of how these costs have been estimated for AoS 1 (Churchill Substation) and AoS2 (west of Nye Road) can be found in the DSOR. AoS1 (Churchill Substation) is referred as Technical Option (TO) 4 in the DSOR, and AoS 2 (west of Nye Road) is referred to as TO 5.

3.20 The DSOR does not contain a detailed breakdown for AoS 3 (East of Nye Road) however this is only a variant of TO4. The cost of AoS 3 would be greater than AoS 2 because it would include approximately 1km of new 400kV connection from the substation to the proposed Bridgwater to Seabank 400kV connection.

Table 1: Estimated capital costs for the three Areas of Search for a new Substation

Area of Search	Cost range £m
AoS 1 Churchill Substation	33.23 - 113.39
AoS 2 West of Nye Road	25.89 – 31.09
AoS 3 East of Nye Road	27.7 – 52.49

3.21 Table 1 above shows that the range in cost is far greater for AoS 1 (Churchill Substation) compared to the other two options. The cost for AoS 1 could potentially reach up to £113m if underground cables are used for the additional 4.5 km of 400kV connection which would be required if the new substation was to be placed alongside the existing substation at Churchill.

Lifetime Costs

3.22 The lifetime cost methodology is explained in full in the DSOR. Based on the level of information available at this stage, Table 2 below sets out the range in lifetime costs associated with the three AoS options for a new substation.

3.23 Again, the costs in Table 2 are presented as a range because they include both overhead and underground options for the associated works.

Table 2: Estimated lifetime costs for the three Areas of Search for a new Substation

Area of Search	Cost range £m
AoS 1 Churchill Substation	36.88 – 117.59
AoS 2 west of Nye Road	29.83 – 34.95
AoS 3 east of Nye Road	31.37 – 56.1

3.24 Similar to the capital cost ranges for the AoS options, AoS 1 has by far the greatest range in cost reaching just past £117m. The cost for AoS 1 could potentially reach just past £117m if underground cables are used for the additional 4.5km of 400kV of connection which would be required if a new substation in the vicinity of the existing Churchill substation were to be selected.

3.25 There is much less difference in range between AoS options 2 and 3. The estimated range in lifetime costs for AoS 3 is greater than for AoS 2. This can be explained by the additional 1km of 400kV connection which would be required for a substation in a location East of Nye Road.

3.26 If capital cost, or lifetime cost, alone were considered, AoS 2 (west of Nye Road) would be the preferred solution. However, National Grid and WPD must balance cost against other factors, including impact on amenity.

Other Considerations:

3.27 The planning policy context for the substation aspect of the Local Electricity Network (LEN) Project is considered in the SSS.

3.28 One of the planning issues to be considered is the impact of the LEN Project on the statutorily designated Area of Outstanding Natural Beauty (AONB). All three AoS for the substation are in areas which could potentially affect the setting of the Mendip Hills AONB and therefore the visual effect of the proposals is an important factor in the assessment of the AoS. AoS 1 and AoS 3 would require additional 400kV connections which, if an overhead line connection were to be selected could potentially affect the purpose of the AONB more than if AoS 2 was to be selected. Due to the presence of natural variations in landform AoS 2 offers the potential to site a substation such that the visual effects on the purpose of the AONB could be minimised. This would be more difficult to achieve in AoS 3.

3.29 The potential effects of the preferred AoS on land-use and socio-economic factors have also been considered and a socio-economic appraisal is included in Appendix 2 of this report. The socio-economic appraisal does not identify any differences between the likely socio-economic impacts of the proposed AoS options which are considered to be of sufficient magnitude to be a determining factor in option selection.

3.30 Chapter 4 of this report will back-check the conclusions of the SSS in light of representations received during the summer 2012 consultation. Prior to this consultation, National Grid and WPD identified AoS 2 (i.e. west of Nye Road) as the Preferred AoS. A preference was expressed for this location because it would allow the new substation to be close to the proposed Bridgwater to Seabank 400kV connection and would not require any additional 400kV connections.

Route Corridor Study (RCS)

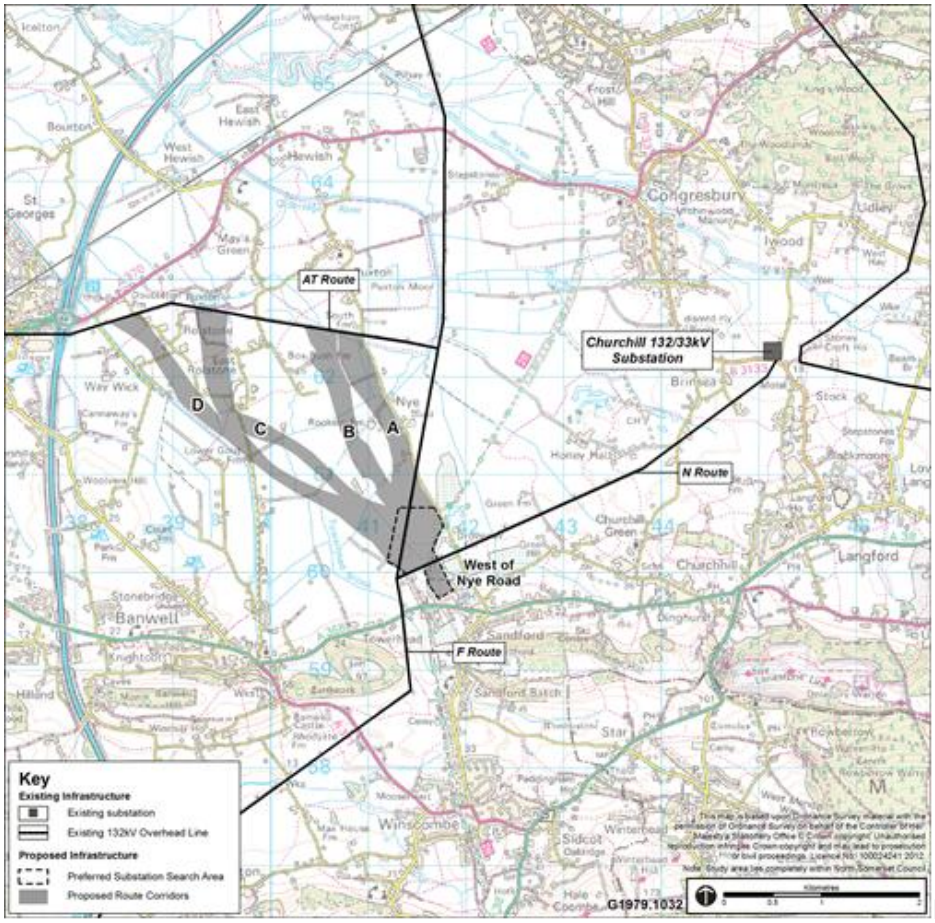
3.31 Following completion of the SSS, a RCS was undertaken to identify potential route corridors for a new 132kV connection between AoS 2 and the existing AT-Route overhead line on the existing local electricity distribution network. It should be noted that wherever the proposed new 132kV connection (as part of this proposed LEN Project) joins the existing AT-Route overhead line, this will render obsolete the section of the existing AT-Route to the east which would allow it to be removed.

3.32 The RCS identified four possible corridors (A-D) for the connection and assessed them against high level environmental and planning constraints with the aim of selecting the least environmentally constrained corridor. The study also considered the technology options: two wood pole lines; steel lattice towers and underground cable.

- Corridor A: a direct connection north from AoS 2 to the AT-Route west of Puxton Moor SSSI and Wildlife Site;
- Corridor B: a connection with the AT-Route to the west of Puxton Moor SSSI and Wildlife Site running to the west of Rookery Farm;
- Corridor C: a connection to the west of East Rolstone; and;
- Corridor D: a connection closer to the M5 to maximise the length of the AT-Route that could be removed.

3.33 These four route corridors are described in detail in the RCS and are illustrated along with the least environmentally constrained AoS for the new substation on Figure 2.

Figure 2: Corridors for the new proposed 132kV Connection and Preferred Area of Search for new substation.



NTS

3.34 The RCS concluded that the least environmentally constrained corridor for a new overhead line connection would be Corridor B as it contains few environmental constraints that would influence routeing and together with Corridor A would be the shortest route at approximately 2km. The route corridor would also enable the removal of approximately 1.2km of the existing AT-Route overhead line.

3.35 The RCS concluded that two single circuit wood pole lines would be preferable to an overhead line supported on steel lattice pylons as the wood poles would be smaller and easier to integrate into the landscape and would result in the least effect on views from residential properties. Although no decision has been made on the detailed connection within the route corridor at this stage i.e. overhead or underground, the RCS does state that if underground cables were used for the entire length of the connection then Corridor D would be the preferred choice as it would result in the removal of the greatest length (approximately 3km) of the existing AT-Route overhead line.

4 SUMMER 2012 CONSULTATION REPRESENTATIONS

4.1 This report will now consider the representations received during the summer 2012 consultation on the proposed Local Electricity Network (LEN) Project. It summarises the representations received from different parties, focussing on the main issues raised and preferences expressed for the options that were consulted on. Further information can be found in the LEN Feedback Report[18]. The LEN Feedback Report reviews in detail the issues raised and explains how these have been taken into account to date and how they could influence the further development of the LEN Project.

Consultation Representations

4.2 The summer 2012 Consultation on the LEN Project took place between 6th June 2012 and 23rd July 2012.

4.3 A consultation feedback form[19] sought views on:

- the proposed location for a new substation in an area west of Nye Road, north of Sandford;
- four possible route corridors for a new 132kV connection which will link the new substation to the existing AT-Route overhead line supplying Weston-super-Mare'

4.4 Prior to this consultation on the LEN Project, National Grid and WPD identified a Preferred Area of Search (AoS) to locate the new substation. A preference was stated towards siting the new substation within AoS 2 i.e. west of Nye Road and it was referred to as the Preferred AoS in the consultation material. As previously discussed in this report, a preference was expressed for this Area of Search (AoS) because it would mean the new substation would be close to the proposed Bridgwater to Seabank 400kV connection and therefore would not require any additional 400kV connections.

[18] National Grid: Hinkley Point C Connection Project – Local Electricity Network Feedback Report (summer 2012): October 2012
[19] National Grid: Hinkley Point C Connection Project Local Electricity Network Feedback Form: June 2012

Consultees

4.5 At this informal stage of consultation National Grid have consulted bodies drawn from the list in Schedule 1 to the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, which sets out those bodies who should be consulted under section 42 of the Planning Act 2008.

Local Authority:

4.6 North Somerset Council (NSC) is the Local Planning Authority (LPA) for the area of the LEN Project and therefore their representations[20] were an important element of this consultation.

4.7 NSC advised that the preferred AoS west of Nye Road, Sandford was their preference and that any landscape and biodiversity impacts should be mitigated by designing the whole sub-station using Gas-Insulated Switchgear (GIS) with extensive landscaping and bat roosting features and swallow ledges.

4.8 The summer 2012 consultation material stated that the preferred option is to build an indoor GIS substation for the National Grid equipment and to use Air Insulated Switchgear (AIS) for WPD's equipment. The Council's comments have been noted and will be taken into account in developing the detailed design of the proposed substation.

4.9 NSC stated a preference for Corridor B from the new substation to the existing AT-Route overhead line. NSC also stated that an overhead connection within this route corridor using wooden poles would be acceptable.

4.10 Its response also stated that whilst undergrounding would have significant extra landscape benefits archaeological and biodiversity interests would have to be addressed if this option was to be selected for the detailed connection.

4.11 The importance of the Area of Outstanding Natural Beauty (AONB) was also emphasised in their response by stating that it is critical that the character of the Mendip Hills AONB, the Tickenham Ridge and the open views across the levels from the settlements of Nailsea, Tickenham and Yatton are protected.

4.12 The LEN Feedback Report details the various technical comments from the specialists within NSC, covering issues such as biodiversity, historic and landscape, that helped formulate its formal response.

[20] North Somerset Council: Response to Summer 2012 Consultation: 26th July 2012

Other Consultees

4.13 Representations were received from other consultees. Firstly Wessex Water[21] confirmed that it had no apparatus in the vicinity of the route corridors. It did however confirm that there is a pumping main in AoS 2 for the new substation. While its response stated that no structures should be located within 6 metres of this main, as twenty four hour access to this main will be required for the purposes of maintenance and repair, it later indicated that it may also be possible to divert this water main to remove any constraints on siting.

4.14 A response was also received from the Mendip Hills AONB Unit[22]. The response stressed the importance of the Mendip Hills AONB when considering the preferred options for the proposed new infrastructure.

Public Responses

4.15 Information produced in support of the summer 2012 consultation was made available to members of the public through a variety of different means, including direct mailings and public exhibitions. The methods used during the consultation period are fully documented in the LEN Feedback Report.

4.16 In total 41 representations were received from the public. There were also 13 additional comments received referring specifically to the summer 2012 consultation yet received through an engagement exercise relating to the proposed 400kV Bridgwater to Seabank connection.

4.17 The issues and questions raised by the public are detailed within Table 2 of the LEN Feedback Report. Issues were raised regarding both the design of the proposed new infrastructure and the locations proposed for its siting. Some general comments were also received referring directly to the consultation process itself. In summary, issues raised regarding the substation were in relation to: its design; siting; the construction period; effects on ecology and landscape; noise; proximity to residential properties; access; mitigation and impacts upon local socio economic; tourism and recreational assets.

4.18 In terms of design some of the representations expressed a preference for the substation to be designed to match local buildings, consistent with a GIS design. Representations also specified that the substation should be well screened, using trees as an example method.

[21] Wessex Water: Response to Stage 3 Consultation: 19 June 2012
[22] Mendip Hills AONB Unit: Response to Stage 3 Consultation: 20th July 2012

4.19 People also expressed a view on where, within AoS 2, they would like to see the new substation located. Some of the representations specifically requested that the substation be located away from the village and road. A number of the representations stated that they would prefer to see the substation sited in a natural ground dip to reduce the impacts on surrounding views.

4.20 People were asked to express their preference on the four route corridors identified in the RCS. As well as being provided with the opportunity to state a preference they were also given the opportunity to express their views and provide information on local issues. Similar to the substation, a number of issues and questions were raised in relation to the route corridors, including: the water environment; mitigation; wirescape; impacts on heritage; pylon design; undergrounding and impacts on socio-economic, tourism and recreational assets.

Conclusions - Public Consultation

4.21 The summer 2012 consultation for the proposed LEN Project did not result in any new information that would alter National Grid and WPD's selection of AoS 2 west of Nye Road as their preferred AoS for a new substation.

4.22 NSC in its formal response stated that AoS 2 west of Nye Road would be its preferred option to locate the new substation.

4.23 In addition, no information emerged from the consultation period that would alter National Grid's and WPD's selection of Corridor B as the least environmentally constrained option to accommodate the proposed new 132kV connection. NSC stated in its formal response to the consultation that using wood poles, in Corridor B, would be acceptable.

5 ASSESSMENT OF ROUTE CORRIDORS FOR WPD 132kV CONNECTION

Introduction

5.1 The assessment reported in Chapter 3, taken together with the results of consultation reported in Chapter 4, have confirmed that west of Nye Road is the preferred Area of Search (AoS) for a new substation. The next stage is to select a preferred route corridor in which a new 132kV connection will be routed to link the new substation back to existing AT-Route overhead line.

5.2 The detailed alignment and technology to be adopted for the proposed 132kV connection between AoS 2 and the existing AT-Route overhead line have not yet been selected.

5.3 As outlined in paragraph 3.33 above, the Route Corridor Study (RCS) concluded that, of four possible route corridors, the least environmentally constrained corridor for a new overhead line connection would be Corridor B. This chapter now tests these route corridors against other factors including:

- Duties under Section 9 of the Electricity Act (including capital and lifetime costs)
- Technical Complexity;
- Planning Policy;
- National Grid and WPD Schedule 9 Duties; and
- Land Use and Socio-Economic Factors

Electricity Act – Section 9 Obligations

5.4 All four of the route corridors proposed could accommodate a 132kV connection which would be system compliant and efficient both in terms of individual scheme performance and the operation of the distribution network. All would be deliverable within the timescale dictated by the connection agreements.

Capital Cost Estimates

5.5 Based on the information available at this stage, the relative capital costs of the route corridors are set out in Table 3 below. These costs are estimates and it is important to note that the length of the routes on which these costs have been calculated are still preliminary as they have been based on the route corridor originating at a centre point within the preferred AoS 2 (west of Nye Road) and two indicative routes (shortest and longest) through the route corridor.

5.6 There are two different types of overhead line supports that could be used for a new 132kV overhead line, either: two rows of wood poles or one row of steel lattice pylons. The RCS concludes that two single circuit wood pole lines would be preferable to a double circuit steel lattice overhead line and so the costs for an overhead circuit presented in Table 3 below are based on the use of wood poles. Generally a steel lattice connection will cost more than a wood pole connection although the difference in cost will depend upon local topography and ground conditions.

5.7 The estimated costs are provided for both overhead line and underground cables as decision on the technology to be adopted for the connection has not been decided at this stage.

Table 3: Estimated Capital Costs of Corridors A-D

Route Corridor	Shortest Route (km)		Longest Route (km)		AT Route Removal (Shortest) (km)	AT Route Removal (Longest) (km)
Route Corridor A	2.2		2.4		0.8	1
	OHL	U/G	OHL	U/G	OHL	OHL
Capital Cost (£m)	£0.35	£4.40	£0.38	£4.80	£0.01	£0.02
Route Corridor B	2.4		2.6		1.1	1.4
	OHL	U/G	OHL	U/G	OHL	OHL
Capital Cost (£m)	£0.38	£4.80	£0.42	£5.20	£0.02	£0.03
Route Corridor C	3.3		3.7		2.2	2.5
	OHL	U/G	OHL	U/G	OHL	OHL
Capital Cost (£m)	£0.53	£6.60	£0.59	£7.40	£0.04	£0.05
Route Corridor D	3.8		4		3.1	3.4
	OHL	U/G	OHL	U/G	OHL	OHL
Capital Cost (£m)	£0.61	£7.60	£0.64	£8.00	£0.06	£0.06

5.8 The cost range for constructing an overhead line within Corridor A (£0.35m - £0.38m) is less than for an overhead line within Corridor D (£0.61m - £0.64m) which is the longest of the four route corridors. The same relationship applies when evaluating the cost of undergrounding within the route corridors and the costs of dismantling the existing AT-Route overhead line, with the cost increasing with the length to be dismantled.

5.9 The costs for an overhead line connection in Corridors C and D (longest corridors) are higher for an overhead line in Corridors A and B (shortest corridors). However the overall difference in cost between all the corridors is not considered to be of sufficient magnitude to be a determining factor between the corridors if the connection were to be overhead.

5.10 The alternative option is to underground the connection. As Table 3 demonstrates, the cost of undergrounding the connection is more costly than using an overhead line. If the circuit were to be undergrounded then Corridor A (shortest corridor) would be the cheapest option (cost range of £4.40m - £4.80m) and Corridor D, would be the most expensive option (cost range of £7.60m - £8.00m). Corridors A and B are similar in cost range as are Corridors C and D. If an underground option were to be selected, based on cost alone, Corridors A and B would be the preferred options, with Corridor A being slightly cheaper.

Lifetime Costs

5.11 Based on the level of information available at this stage, the relative lifetime costs associated with a connection between the proposed substation in AoS 2 and the existing AT-Route overhead line are shown in Table 4.

Table 4: Estimated Lifetime Costs of Corridors A-D

Route Corridor	Shortest Route (km)		Longest Route (km)		AT Route Removal (Shortest) (km)	AT Route Removal (Longest) (km)
Route Corridor A	2.2		2.4		0.8	1
	OHL	U/G	OHL	U/G	OHL	OHL
Lifetime Cost (£m)	£0.58	£4.57	£0.63	£4.99	£0.01	£0.02
Route Corridor B	2.4		2.6		1.1	1.4
	OHL	U/G	OHL	U/G	OHL	OHL
Lifetime Cost (£m)	£0.63	£4.99	£0.68	£5.40	£0.02	£0.03
Route Corridor C	3.3		3.7		2.2	2.5
	OHL	U/G	OHL	U/G	OHL	OHL
Lifetime Cost (£m)	£0.87	£6.86	£0.97	£7.69	£0.04	£0.05
Route Corridor D	3.8		4		3.1	3.4
	OHL	U/G	OHL	U/G	OHL	OHL
Lifetime Cost (£m)	£1.00	£7.89	£1.05	£8.31	£0.06	£0.06

5.12 Lifetime costs have been estimated for both overhead line and underground cable options and as with capital costs, lifetime costs increase with route length. There is little to chose between the four route corridors for an overhead line with Corridor A the cheapest option (£0.58m) and Corridor D (£1m) the most expensive. The costs for undergrounding the connection are higher than an overhead line with, for example, the cost range for undergrounding Corridor B being £4.99m - £5.40m compared with the cost range for an overhead line for Corridor B of £0.63m - £0.68m.

5.13 Due to their similar lengths, the cost range for Corridors A and B are relatively close together as are Corridors C and D.

Conclusions – Section 9 Obligations

5.14 Based on the analysis within this section, cost would not become a determining factor between the four route corridors for an overhead line connection as there is little difference between the ranges of costs identified. If an underground option were to be selected then Corridors A and B would be preferable to Corridors C and D with Corridor A being of the lowest cost.

Technical Comparison:

5.15 Two technology options, overhead line or undergrounding were considered for the potential connection. There is extensive operational experience of both 132kV overhead lines and underground cables, and no operational issues are envisaged with either technology.

5.16 Two designs were considered for the overhead lines, wood poles and steel lattice structures. There is extensive experience of both designs and neither would introduce any operational issues for the new connection.

5.17 In terms of deliverability, there would be increased volumes of construction activity associated with increasing the length of the connection and therefore Corridors C and D would involve the most amount of work. However, there are no anticipated delivery issues with any of the options.

5.18 There are no technical differentiators between the four route corridors that would be a determining factor in the selection of a preferred corridor. Corridors C and D would have more associated construction work. However this issue in isolation would not be a determining factor.

Planning Policy Context:

5.19 Planning policy considerations for the route corridors are considered in the RCS.

5.20 One of the key considerations from a planning policy perspective is the impacts of infrastructure proposals on nationally designated areas as stated in both EN-1[23] and EN-5[24]. In respect of the four route corridors, the close proximity to the Mendip Hills AONB and the potential visual impact of the proposals affecting the purpose of the AONB is an important consideration.

5.21 The potential for effects on the Mendip Hills AONB was considered in the RCS which concluded that if an overhead connection were to be used then Corridors A and B would be preferred to Corridors C or D as they would offer the shortest most direct routes to the existing AT-Route overhead line and there would be less visual disturbance of the open countryside and of views in and out of the AONB. If however undergrounding were to be the preferred technology option for the connection then the RCS concludes there would be little to distinguish between the corridors but Corridor D would be preferred over Corridors A, B

[23] Department for Energy and Climate Change: Overarching Energy National Policy Statement: July 2011
[24] Department for Energy and Climate Change: National Policy Statement for Electricity Networks Infrastructure: July 2011

and C as it would provide the opportunity to remove the greatest length of the existing AT-Route overhead line. This would therefore have the most positive visual impact on the landscape and views.

5.22 Other planning policy considerations within the study area are the impacts on environmental, cultural heritage assets and designations. The RCS identified Corridor B as the least environmentally constrained option as it contains few environmental constraints that would influence routeing and together with Corridor A is the joint shortest route. Corridor B also avoids heritage designations including Scheduled Monuments and listed buildings.

5.23 If the connection were to be undergrounded, from a heritage and ecological perspective, then Corridors A and B would be the preferred options in accordance with planning policy aims, because they offer the shortest and most direct routes, and are therefore less likely to impact on heritage and ecology.

Schedule 9 Duties and WPD Guidance

5.24 WPD's obligations under Schedule 9 of the Electricity Act 1989 include minimising impacts on communities, historic and natural assets. WPD also consider the principles set out in the 'Holford Rules' the use of which is supported in the National Policy Statements. While these rules are intended to inform decisions on detailed alignments, they are also important in the identification and assessment of route corridors.

5.25 The RCS identified and assessed four route corridors against a series of factors and concluded that based on the information available at the time of the study, the least environmentally constrained route corridor for a new overhead line connection is Corridor B as it contains few environmental constraints that would influence routeing and is the joint shortest route corridor option.

5.26 The Holford Rules were applied in the RCS to guide the definition of potential route corridors. Situations where route corridors or alignments meet all of the Rules simultaneously are rare. Whilst the study area for the corridors is outside the boundary of the Mendip Hills AONB it is in close proximity and therefore minimising the impact on the AONB would be within the spirit of Rule 1. If an overhead line were to be selected then Corridors A and B would be the preferred options as they are the shortest and most direct routes and would result in less new infrastructure than a connection in Corridors C or D.

5.27 On the basis of WPD policies and obligations under Schedule 9 of the Electricity Act 1989, Corridors A and B would be the preferred route for an overhead line wood pole connection. If steel lattice pylons were to be used then Corridors A and B could result in the creation of 'wirescape' in the vicinity of the proposed new Bridgwater to Seabank 400kV connection.

5.28 If undergrounding was the preferred option then Corridor D would be the preferred route corridor as it would result in greater landscape benefits as the result of removing more of the existing AT-Route overhead line.

Land Use and Socio-Economic Factors

5.29 A socio-economic appraisal has been undertaken to consider the potential effects of the route corridors on land-use and socio-economic factors in the study area. This is contained in Appendix 2 of this report.

5.30 The socio-economic appraisal in Appendix 2 does not identify likely impacts for any of the proposed route corridors which would be considered to be of sufficient magnitude to be a primary determining factor.

5.31 Proposed Corridors C and D are considered from a socio-economic perspective to be the least preferable due to the longer length of connection required for these options and their proximity to East Rolstone and Rolstone. Corridors C and D are likely to have additional negative effects on visual connections with Puxton Park and Court Farm, respectively. Corridors A and B are shorter and are therefore preferred as they present a smaller scale of change in comparison with the existing situation. Of all proposed route corridors, Corridor B is located furthest from nearby hamlets and access roads and is therefore anticipated to have the least impact on local socio-economic resources.

5.32 Overall, the balance of socio-economic effects would favour Corridor B due to the reduced impact on the socio-economic features in the immediate vicinity and the reduced length of required connection.

Conclusions on Route Corridors for WPD 132kV Connection

5.33 On the basis of the evidence presented in the RCS and this report and its appendices, it is considered that Corridor B, which was identified as the least environmentally constrained corridor in the RCS, should be confirmed as the Preferred Route Corridor. This section has assessed the four route corridors

against various factors for both overhead and underground connections, including:

- Public Consultation – The summer 2012 consultation for the proposed LEN Project did not result in any information that would suggest that Corridor B (least environmentally constrained) should not be taken forward as the preferred route corridor. NSC stated in their formal response to the summer 2012 consultation that using wood poles, Corridor B, would be acceptable.
- Cost - Based on the analysis within this section, cost would not become a determining factor between the four route corridors for an overhead line connection as there is little between the ranges of costs identified. If an underground option was to be selected then Corridors A and B would be the more preferable choices with little difference between the two in cost terms;
- Technical Complexity - There are no technical differentiators between the four route corridors;
- Planning Policy - One of the key considerations from a planning policy perspective is the impacts of the LEN Project on nationally designated areas as stated in both EN-1 and EN-5. If an overhead connection were to be used then Corridors A and B would be the preferred options as they would offer the shortest most direct routes to the existing AT-Route overhead line and there would be less visual disturbance of the open countryside and of views in and out of the AONB. Corridor B would permit an additional section of the existing AT-Route overhead line to be removed over Corridor A. If however undergrounding was the preferred technology for the connection then Corridor D would be preferred. This is because it would enable circa 3km of the existing AT-Route overhead line to be dismantled and would therefore have the most positive visual impact on the landscape, within view of the AONB;
- Corridor B would avoid heritage designations including Scheduled Monuments and listed buildings and therefore in keeping with heritage policies at national and local levels. If the connection were to be undergrounded then Corridors A and B would be the preferred options from ecological and heritage perspectives because they would offer the shortest routes and therefore would have less likely impact on habitats and any below ground archaeology. On balance therefore Corridor B for either

an overhead line or underground connection would be the preferred route corridor.

- Schedule 9 Duties and WPD Guidance - On the basis of an assessment against WPD policies and obligations under Schedule 9 of the Electricity Act 1989, and an assessment against the Holford Rules, Corridors A and B would be preferred for an overhead connection, as these are the shortest most direct routes. If undergrounding was the preferred technology then Corridor D would be preferred as it would result in greater landscape benefits;
- Land Use and Socio-Economic Factors - Overall, the balance of socio-economic effects would favour Corridor B due to the reduced impact on the socio-economic features in the immediate vicinity and the reduced length of required connection.

5.34 Having taken into account the above, the preferred route corridor for a 132kV overhead line connection would be Corridor B. While Corridor D would deliver the greatest benefits in terms of landscape and visual amenity, its cost would be greater and it would have potentially larger effects on wildlife and habitats including direct effects on Towerhead Brook and the River Banwell wildlife sites and archaeology. For an underground connection, Corridor B would also perform well on grounds of cost and effect on ecology, heritage and socio-economic factors.

5.35 In conclusion therefore it is recommended that Corridor B be taken forward whether an overhead or underground solution is ultimately adopted. If an overhead line is selected for the 132kV connection, as stated in the Route Corridor Study, a wood pole connection would be preferred.

6 DEVELOPING A PREFERRED SUBSTATION LOCATION

Introduction

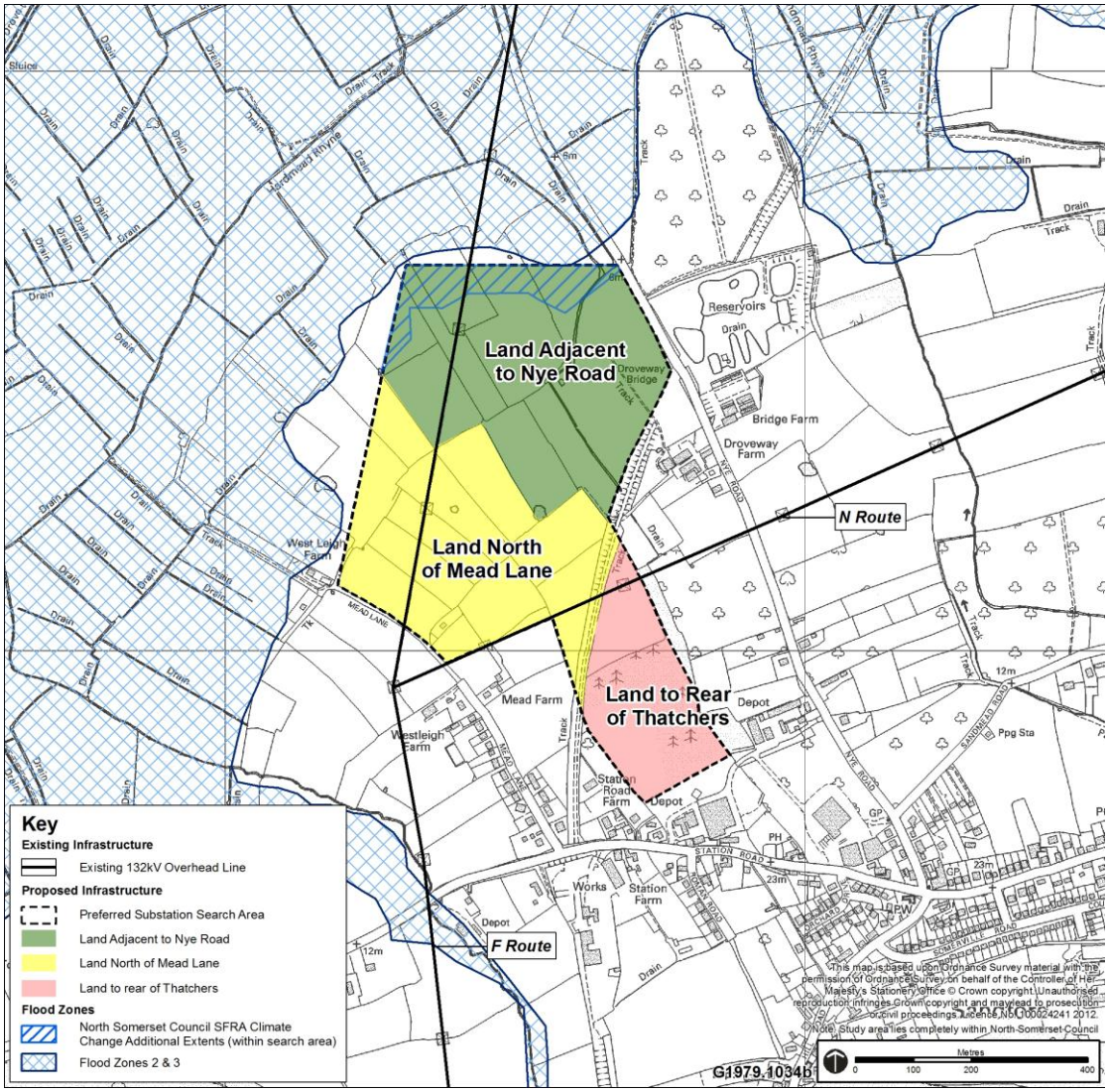
6.1 Following the confirmation of the preferred Area of Search (AoS) for the substation to the west of Nye Road, the next stage in the process is to identify the best location within the large AoS to construct the new substation. A Substation Siting Appraisal (SSA) was undertaken to assess the AoS in terms of planning and environmental constraints and identify the least environmentally constrained zone to locate the new substation. This report should be read in conjunction with the SSA.

6.2 Three areas of land within the AoS were identified where the new substation could be sited:

- Land adjacent to Nye Road, north of Droveway Farm;
- Land north of Mead Lane; and
- Land to the rear of the Thatcher's Cider factory.

These are shown on Figure 3 below.

Figure 3: Three areas for potential substation locations



NTS

6.3 The SSA considered the three areas of land against various environmental factors including: ecology, landscape and views, cultural heritage/archaeology, noise, the water environment and access.

6.4 The Substation Siting Study (SSS) identified that access was a key consideration associated with the preferred AoS west of Nye Road. An Abnormal Indivisible Load (AIL) access study has been undertaken to consider this issue further and the SSA draws upon its findings to identify the least constrained point of access to the proposed substation site.

6.5 The Bridgwater to Seabank Connection Options Report[25] recommends that an underground cable is used through the Mendip Hills Area of Outstanding Natural beauty (AONB) and that the cable is extended beyond the northern boundary of the AONB and to the proposed substation at Sandford. The SSA identifies that as an access road from a new junction off the A368 would be required for the 400kV Bridgwater to Seabank underground cable construction easement, using this same access for the purpose of substation construction and maintenance would focus development in one location and would remove the requirement to construct an additional access road through the Thatcher's Cider Factory..

6.6 It should also be noted here that the SSA was informed by two external studies, including:

- Abnormal Load Movement Route Scoping – Further Investigations[26]
- Level 1 Flood Risk Assessment (Screening Study)[27]

6.7 The SSA identified the eastern part of the area referred to as 'Land adjacent to Nye Road' in Figure 3 as the least environmentally constrained zone for the substation. The appraisal confirms that the substation should be sited to avoid the area identified as an extension of Flood Zone 3 on the North Somerset Council (NSC) Level 1 Strategic Flood Risk Assessment (SFRA)[28] mapping (as shown in Figure 3 of this report).

6.8 The full assessment of the three areas considered is contained with the SSA however a summary of the issues raised is contained below:

- Ecology - there do not appear to be any significant differences between the areas based on ecological considerations;
- Landscape Character and Views – Land adjacent to Nye Road is more open in character than land to the rear of Thatcher's, however the land is lower and there are fewer properties in this area of land. A new substation in this part of the AoS would give rise to fewer effects on landscape character than in land to the north of Mead Lane as it would be closer to and associated with this existing built development. It would also maximise distance from the AONB;

[25] National Grid: Hinkley Point C Connection Project: Bridgwater to Seabank Connection Options Report: October 2012
[26] South West Alliance (Jacobs): Hinkley Site Investigations - Abnormal Load Movement - Route Scoping – Further Investigations: August 2012
[27] South West Alliance (Jacobs): Level 1 Flood Risk Assessment (Screening Study). Proposed Development at land West of Nye Road, Sandford : August 2012
[28] A Strategic Flood Risk Assessment looks at flood risk at a strategic level on a local planning authority scale

- Heritage - There are no significant differences between the areas based on heritage considerations;
- Water Environment – All three areas within the AoS fall within Environment Agency Flood Zone 1;
- Noise - locating a substation in the north of the AoS would be the optimum position to avoid potential effects by maximising separation from residential properties. The topography in the north is also lower than other parts of the AoS, which could assist in the attenuation of noise over distance compared with land to the rear of Thatcher's or North of Mead Lane which are on higher ground.

6.9 This report will now assess this least environmentally constrained zone and the other two areas of land against various factors including: cost and technical complexity; planning policy; relevant guidance and socio-economic factors.

Electricity Act – Section 9 Obligations

6.10 Section 9 of the Electricity Act 1989 requires National Grid and Western Power Distribution (WPD) to develop the transmission and distribution systems in an efficient, coordinated and economical manner.

6.11 Cost and technical complexity have been factors used in the appraisal of technical options (in the Distribution Systems Options Report) and in the selection of a preferred AoS. As each of the three potential areas of land within the preferred AoS are relatively close to each other, there will be very little variance in the overall cost of each option and therefore cost would not provide a basis for choosing between the options. Likewise, from a technical perspective, each of the three potential areas of land are identical and would not provide any basis for determining a preferred location.

6.12 Neither cost nor technical complexity are factors that help distinguish between the options.

Planning Policy Context

6.13 The principal policy issue to be considered in the assessment of these proposals is the effect the new substation would have on the purpose of the Mendip Hills AONB, which is underpinned in National Policy Statements.

6.14 All three areas of land could potentially affect the purpose of the Mendip Hills AONB and therefore the visual impact of the proposals is an important factor in

assessing options. The area of land identified as the least environmentally constrained zone is lower lying than land to the rear of Thatcher's and despite not having the benefit of industrial buildings in the immediate vicinity, siting the substation in this vicinity would be in a natural dip in the landform and it could be designed to blend in with existing agricultural buildings.

6.15 A substation located in the more open parts of the AoS e.g. west of the F-Route and to the north of Mead Lane would be considered as being more visually prominent, not least because it would be detached from the existing pattern of development, and would have less screening. Consequently it would have more of a greater visual impact.

6.16 In terms of the themes of biodiversity and heritage assets, which are identified in planning policy, there do not appear to be any significant differences between the options.

National Grid and WPD Guidance

6.17 The Horlock Rules are used by National Grid as guidance when siting and designing of new substations.

6.18 The Horlock Rules were used as an informative base for the SSA and the main themes which arise from the Horlock Rules are discussed in detail the accompanying SSA.

6.19 As discussed in the previous sub-section, the Mendip Hills AONB is an important factor to be considered when assessing the potential visual impact of the proposals on the landscape. In accordance with this guidance, the land identified as the least environmentally constrained zone would be slightly preferable to other locations within the AoS. The consistency of the proposals against the other guidelines within the Horlock Rules is discussed in detail in the SSA however a summary of the issues raised is contained below:

- Ecology - there do not appear to be any significant differences between the areas based on ecological considerations;
- Landscape Character and Views – Land adjacent to Nye Road is more open in character than land to the rear of Thatcher's, however the land is lower and there are fewer properties in this area. A new substation in this part of the AoS would give rise to fewer effects on landscape character than a location on land to the north of Mead Lane as it would be closer to and associated with the existing built development;

- Heritage - There are no significant differences between the areas based on heritage considerations;
- Water Environment – All three areas within the AoS fall within Environment Agency Flood Zone 1;
- Noise - locating a substation in the north of the AoS would be the optimum position to avoid potential effects by maximising separation from residential properties. The topography in the north is also lower than other parts of the AoS, which could assist in the attenuation of noise over distance compared with land to the rear of Thatcher's or North of Mead Lane which are on higher ground.

6.20 The main themes emerging from the Horlock Rules were discussed in detail in the SSA. It is considered that the Mendip Hills AONB is an important factor to be considered when assessing the potential visual impact of the proposals on the landscape, as recognised in Guideline 2 of the Horlock Rules.

6.21 The land identified as the least environmentally constrained zone would be slightly preferred to other areas of land within the AoS when assessed against likely visual impacts on the AONB.

Land Use and Socio-Economic Factors

6.22 A socio-economic appraisal has been undertaken to consider the potential effects of the three areas within the preferred AoS based on land-use and other socio-economic factors. This assessment is contained in Appendix 2 of this report.

6.23 At this stage it is considered unlikely that the proposed substation within this AoS will have effects on the popularity and viability of socio-economic resources within the AONB, most notably Dolebury Warren Hill Fort and Banwell Fort assets. From a visual amenity perspective, the least environmentally constrained zone identified in the SSA is considered preferable.

6.24 There is the potential for disturbance to the dismantled railway line that is protected as a proposed Strategic Cycle Route, both from the turning in of the N-Route into the new substation and a potential access road via land to the rear of Thacher's Cider factory to a substation north of the line. However only a short length of the overall proposed route is in proximity to the AoS and a substation in this area is not anticipated to affect its future potential popularity as a route.

6.25 A substation to the Rear of Thatcher's is the least preferable location from a socio-economics perspective due to potential disruption to commercial activities. At present, anticipated socio-economic impacts do not provide a differentiator between the potential substation locations on Land adjacent to Nye Road and Land North of Mead Lane.

Conclusions on Location Options for a Substation

6.26 On the basis of the evidence presented in the SSA and the supplementary information presented in the appendices of this report, it is concluded that the area of land identified in the SSA as the least environmentally constrained zone i.e. Land adjacent to Nye Road should be confirmed as the preferred location for a new substation.

6.27 The proposed location is also recognised as having least potential effect on residential properties both in terms of visual presence and potential noise effect.

7 CONCLUSIONS AND NEXT STEPS

7.1 This report has explained the need for the Local Electricity Network (LEN) Project and how it forms part of the Hinkley Point C Connection Project. A Substation Siting Study (SSS) identified Area of Search 2 (AoS) as the least environmentally constrained option to locate the new substation. National Grid and Western Power Distribution (WPD) confirmed that this was their preferred AoS for the new substation because it would be in the vicinity of the proposed Bridgwater to Seabank 400kV connection and a new substation within this AoS would not therefore itself require any additional 400kV connections.

7.2 Once a preference was stated for the AoS, National Grid and WPD then had to consider how this substation would be connected back to the local distribution network via a 132kV connection. A Route Corridor Study (RCS) was produced which identified a least environmentally constrained route corridor to accommodate a new 132kV connection from the new substation to the existing AT-Route overhead line.

7.3 The preferred AoS for a new substation and the route corridors for the associated 132kV connection were then tested against the representations from the summer 2012 consultation. No information emerged from this consultation that would alter National Grid's and WPD's selection of AoS 2 as their preferred AoS for a new substation. In addition, no information emerged to indicate that National Grid and WPD should not take forward a new 132kV connection within Corridor B.

Conclusions

7.4 On the basis of the factors discussed in this report and the supporting documentation, it is concluded that:

- AoS 2 (i.e. west of Nye Road, Sandford) is confirmed as the Preferred AoS for the new substation;
- Corridor B, which was identified as the least environmentally constrained route corridor in the RCS, is confirmed as the Preferred Route Corridor to accommodate the required 132kV connection from the new substation to the existing AT-Route overhead line;
- The area of land adjacent to Nye Road within AoS 2 is confirmed as the preferred location for a new substation.

Next Steps

7.5 Following the adoption of a preferred route corridor to accommodate the new 132kV connection, detailed consideration will be given to alignments within the route corridor and the technology. The issues raised during the summer 2012 consultation will be considered during this process. The detailed connection will be subject to environmental impact assessment and further public consultation.

7.6 National Grid and WPD are currently working on the technical design of the substation to minimise the overall footprint and minimise visual impact. Comments received during the summer 2012 consultation process will be considered when looking at its design.

7.7 The findings of this report will be made available for interested parties to comment upon. Comments received on this report will help to inform the development of a detailed connection design for this part of the Hinkley Point C Connection Project.

APPENDIX 1

Western Power Distribution and National Grid Role and Obligations

A1.1 Both the distribution and transmission of electricity in Great Britain requires permission by a licence granted under Section 6(1)(b) and (c) of the Electricity Act 1989 ("the Electricity Act").

A1.2 The legislative and regulatory framework is designed to ensure coordination and efficient investment by the distribution and transmission companies. These principles are central to the respective licences and industry codes.

WPD Role and Obligations

A1.3 WPD has been granted a distribution licence and is therefore bound by the legal obligations set out in the Electricity Act and their distribution licence.

A1.4 WPD owns and operates the distribution system in the South West, South Wales and the Midlands.

A1.5 WPD has statutory duties to develop and maintain an efficient, coordinated and economical system of electricity distribution under Section 9 of the Electricity Act. These duties, which are documented in Standard Licence Conditions[1], are summarised in the following paragraphs.

A1.6 Standard Condition C24 (Distribution System planning standard and quality of performance reporting) of WPD's distribution licence requires WPD to plan and develop its distribution system in accordance with standards set out in Engineering Recommendation P2/6[2].

A1.7 P2/6 is a document that defines the minimum standards that WPD must apply when planning and operating the distribution system. The criteria include the type of faults (or breakdowns) and combinations of faults that the distribution system must be able to withstand, the impact on customers in terms of maximum level of supply interruptions, and the impacts on supply quality that are permissible.

A1.8 P2/6 is open to industry and public scrutiny, is subject to periodic review and consultation and any changes are implemented by a change to the licence Standard Conditions and approved by the industry regulator, Ofgem[3].

A1.9 As well as the technical standards described above, Section 38 and Schedule 9 of the Electricity Act 1989 requires WPD, when formulating proposals for new lines and other works, to:

"*…have regard to the desirability of preserving natural beauty, of conserving flora, fauna, and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and shall do what [it] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects*"[4]

A1.10 WPD's Schedule 9 statement[5] (the "Statement") sets out how the company will meet the duty to the environment placed upon it. These commitments include:

- minimise the impact of its activities on communities and the historic and natural environment;
- only seeking to build new lines along new routes, or substations in new locations where the existing distribution system infrastructure cannot be economically upgraded to meet distribution security standards;
- where new infrastructure is required seek to avoid, where reasonably practicable, areas which are nationally or internationally designated for their landscape, wildlife or cultural significance;
- site overhead lines with care and consider both the visual impact and the impact on nature conservation as far as possible; and
- continually work with partners to selectively underground lines in appropriate sensitive locations to improve the appearance of countryside, towns or villages, whilst taking account of sites of particular archaeological or nature conservation interest.

A1.11 Effective consultation with stakeholders and the public is also promoted by the Statement.

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[1] **http://epr.ofgem.gov.uk/document_fetch.php?documentid=15184**

[2] P2/6 can be purchased from www.energynetworks.org

[3] **http://www.ofgem.gov.uk/Pages/OfgemHome.aspx**

[4] Schedule 9 of the Electricity Act (**http://www.legislation.gov.uk/ukpga/1989/29/contents**).

[5] **WPD Schedule 9 Statement:** http://www.westernpower.co.uk/getdoc/c4856406-1794-4e34-81a0-9f2b593cdd4a/schedule9.aspx

APPENDIX 2

1 HINKLEY POINT C CONNECTION PROJECT – LEVEL 2 SOCIO-ECONOMIC APPRAISAL FOR THE SUBSTATION AT CHURCHILL/SANDFORD

1.1 INTRODUCTION

ERM has been appointed by National Grid to undertake a Level 2 Socio-economic Appraisal of three Areas of Search proposed as locations for a new substation in the Churchill/Sandford area and associated supporting infrastructure. This document has been produced within the context of National Grid's *"Draft Methodology Guidance for Option Appraisal – Part C – Level 2 Options Appraisal"*(May 2011).

Three location options for the new Grid Supply Point substation (called Areas of Search) have been identified for consideration in the Churchill/Sandford area. These are described in detail in the *Churchill/Sandford Grid Supply Point Substation Siting Study* (Report Ref: 1979.01.007 r02, March 2012). Options for connecting Area of Search 2 (see below) to the existing AT route are described in the *Western Power Distribution (WPD) 132kV Route Corridor Study* (Report Ref: 1979.096 r02, March 2012). The Areas of Search are shown on Figure 1.1and are summarised below.

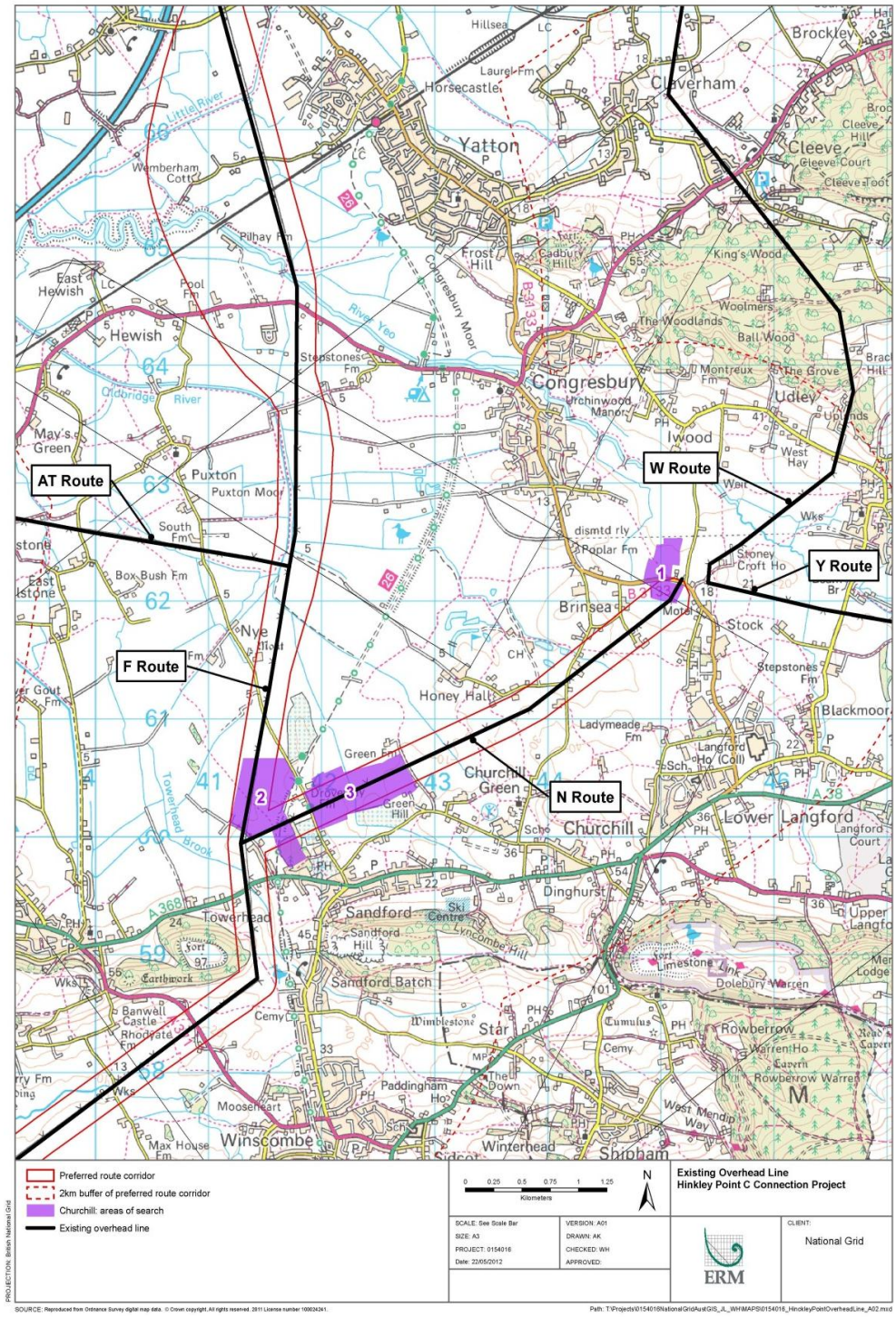
- **Area of Search 1: Churchill Substation**: New substation adjacent to or to the south of the existing Churchill 132kV substation, new 400kV line from the existing F route to the new substation, using route of existing 132kV line, new 132kV line between new substation and existing AT Route 132kV line to the west .

- **Area of Search 2: West of Nye Road**: New substation near the existing132kV F Route and N Routes, including land to the rear of Thatcher's Cider factory, new 132kV connection between the new substation and existing 132kV AT Route, new 132kV connection between new substation and existing N Route 132kV line and new access road from the A368 to the new substation.

- **Area of Search 3: East of Nye Road**: new substation beneath the 132kV Route, north of Sandford and west of Churchill Green, new 132kV connection between the new substation and existing 132kV AT Route, new 400kV connection between new substation and new 400kV Bridgewater to Seabank overhead line and new access road from the A368 to the new substation.

All substations will have a building footprint of either 250m by 250m or 150m by 200m, depending on the type of substation selected, which will be determined in due course. All options also require connection in (turning in) of the W Route and Y Route to the existing Churchill substation with a double circuit overhead line of approximately 250m.

Figure 1.1 Location of Areas of Search1, 2 and 3 and existing Western Power Distribution Routes



1.2 SOCIO-ECONOMIC BASELINE

National Grid's definition of socio-economics comprises three sub-topics: Economic activity; Traffic and transport; and Aviation and Defence. Traffic and Transport and Aviation and Defence have been scoped out of this Options Appraisal, as anticipated socio-economic impacts in these sub-topics are not considered to offer a noticeable difference between the options. There is likely to be some local economic benefits from construction activities from local expenditure by construction workers. However, this is considered to be consistent across all the areas of study and is not considered further.

The Economic Activity element of the National Grid assessment methodology requires assessment of strategic land allocations, tourism and recreation features and attractions, and Agricultural Land Classification (ALC)[1] and minerals.Three stages of data collation were undertaken for this assessment:

- Collation and mapping of relevant publically available geo-referenced data sets;
- Site visits to the study area to validate desk study data;
- Desk study research to inform overall socio-economic and policy context of the area.

1.3 GEO-REFERENCED DATASETS

Features located within 10km of the Areas of Search were identified and mapped (See Annex 1) from the data sources listed below.

Strategic Land Allocations

- Planning applications within a 500m buffer of the Proposed Route Corridor – Digitised from District Council websites
- Employment allocations from local plans – mapped from Local Plan

Tourism and Recreation Features and Attractions

- Community Facilities (e.g. secondary schools, colleges and hospitals) - Ordnance Survey Address Layer 2. (Reproduced from Ordnance Survey digital map data © Crown copyright 2012. All rights reserved. OS Licence number 0100031673)
- National Walking Routes – Natural England – MAGIC database
- National Cycle Trails – Natural England – MAGIC database

[1]The ALC system classifies agricultural land into five grades, with Grade 3 subdivided into Subgrades 3a and 3b. The best and most versatile (BMV) land is defined as Grades 1, 2 and 3a by policy guidance. The available ALC data 2002 for this study does not provide the subdivision of Grade 3 land, so Grade 3 has been used as a proxy for BMV land.

- Public Rights of Way – data provided by Local Authorities covered by Preferred Route Corridor (Sedgemoor, North Somerset, City of Bristol and South Gloucestershire Councils)
- Scheduled Monuments – English Heritage
- National Parks – Natural England – MAGIC database
- World Heritage Sites – English Heritage
- CROW land – Natural England – MAGIC database
- Open Access Land – Natural England – MAGIC database
- Tourism and recreation-related businesses – data obtained from The Post Office from a variety of sources including Royal Mail and Yellow Pages, based on business type registrations within 10km of the proposed route corridor

The Post Office business types requested and the number of each business within the 10km study area are presented inAnnex 2.

Agricultural Land Classification

- Agricultural land Classification – Natural England – MAGIC database

Minerals Resources

- Waste and Minerals allocations – mapped from Local Plans

1.4 SITE VISITS

A site visit was undertaken on 25 April 2012 to verify the findings of the desk based assessment, gain additional details of the site context (e.g. brown signed visitor attractions) and to identify additional features of note which may not have been highlighted through the desk study. Those features which are relevant to the study area have been integrated into the baseline mapping in Annex 1.

1.5 DESK STUDY RESEARCH

A review of publically available data sources was undertaken to identify the economic context of the region, the value and nature of tourism in the area, and the most highly visited local tourist resources in the South West of England. The information obtained was drawn primarily from the West of England Local Economic Assessment, 2011 (West of England Local Enterprise Partnership), the Somerset Visitor Survey 2009/2010 (South West Research Company) and information from the South West Tourism Alliance.

This background research into tourism is presented in Annex 2 alongside a summary of the Post Office data for tourism and recreation-related businesses.

Specific socio-economic features for the study

The Socio-economic study area has on similar studies been defined by the Theoretical Zone of Visual Influence (tZVI). At the time of completing this appraisal the tZVI was not available. Therefore, a conservative approach of collating desk based data for a 10km buffer was undertaken. The site validation surveys identified that due to the local nature of direct impacts of theproposed options, for example potential disruption to current economic activities and possible reduced visual amenity value of the area to tourists, the likely zone of impact would be considerably less than the 10km radius and the primary focus of the assessment was reduced to a 2km area around the Areas of Study.

Based on the desk study research of local socio-economic characteristics and features (presented in Annex 2), the relevant socio-economic features common to all Areas of Search in the 2km study areaare:

- The *Mendip Hills AONB* which is of National importance and contains a number of specific regional/local tourism attractions. The closest of these to the Sandford/Churchill area include Dolebury Warren Hill Fort and Banwell Camp (a hill fort).

- The *Strawberry Line*(23km) (identified as *National Trails* in Annex 1) - a disused railway line which is now part ofRoute 26 of Sustrans National Cycle network and as such of considered of national importance. Along part of the route there is a Local Nature Reserve. Many local footpaths also connect with this route.

- The *West Mendip Way*(48km) – Regionally important long distance walking path promoted by the Long Distance Walkers Association. This is not a designated National Trail.Many local footpaths connect with this route.

- The *Avon Cycleway*(136km) – Regionally important cycle route, promoted by Sustrans as Regional Route 10.

- *Grades 3 and 4 Agricultural Land* – Grade 3 land is for the purposes of this assessment considered to be of national importance as the subdivision of Grade 3a and 3b is not available at this level of assessment. Grade 4 land is of local importance.

- *Mineral Resource Area allocation* at Sandford – Regionally important allocation within North Somerset Waste and Minerals Plan.

- *Population centres* – Towerhead, Sandford, Churchill, Langford, Lower Langford, Stock, Brinsea, the southern edge of Congresbury and the south western edge of Wrington are the communities which could be affected by this option, all of which are considered to be of a local scale and which include local tourist accommodation, principally Bed and Breakfast and Guest Houses, which are well situated for tourists visiting the Mendip Hills.

- The *Thatcher's Cider Factory* at Sandford which represents a tourist attraction and is noted as a potentially important contributor to the local economy and employer. Whilst it is recognised there are a number of other employers and business locations in the area, Thatcher's has been considered further given the proximity to the Areas of Study and the dependence on land area for orchards.

1.6 SOCIO-ECONOMIC OPTIONS APPRAISAL

All Areas of Search

This section considers the potential socio-economic effects to receptors which are consistent across the three areas of study. These include strategic land allocations, tourism and recreation features and attractions, local Agricultural Land Classifications and minerals resources. No internationally important socio-economic features are located in the study area.

The potential loss of Best and Most Versatile (BMV) agricultural land (ie Grades 1-3) would be limited to the substation footprint and any associated on the ground infrastructure such as the access roads and pylon footprints. Whilst it is likely that all options will result in the loss of some BMV land, the quantum lost will be relatively small within given the size of the substation footprint within the overall agricultural context of the area. The substation should be located on Grade 4 or 5 agricultural land wherever possible. Should the project be progressed on Grade 3 or above agricultural land the development will be required to satisfy Policy 20 of the Bath and North East Somerset, Bristol, North Somerset and South Gloucestershire Joint Replacement Structure Plan (2002) which states that

"*The best and most versatile agricultural land (Grades 1, 2 and 3a) will be safeguarded. Provision should be made for development which would lead to the loss of such land only if:*

- *there are reasons of overriding public interest; and*
- *there are no suitable alternative sites on lower quality land, or*
- *such land is subject to statutory protective designations which outweigh agricultural considerations."*

All the study areas have the potential to result in temporary disruption to local transport infrastructure and could reduce local amenity value as a result of construction activities; resulting in noise levels and visual intrusion. Public footpaths and cycle routes may also need to be diverted during construction. It is anticipated that good practice construction management techniques would minimise these effects and would be incorporated into the scheme development of the option progressed.

The features identified above are not considered to be affected to a level that represents a significant socio-economic risk to the proposed development within the areas of study.

Area of Search 1 – Churchill Substation

Identified area-specific socio-economic impacts for Area of Search 1:

1. The landscape and visual appraisal has identified that views of the new 400kV route to Churchill will be possible from elevated ground in northern areas of Mendip Hills AONB. Of greatest relevance is Dolebury Warren Hill Fort which, at its closest point, is approximately 2km away. The magnitude of likely visual impacts from this feature will be assessed in more detail should this option be progressed and at such time the potential for associated socio-economic effects will be considered, although at this time this is considered unlikely.

2. Connections to the new substation for this option will cross the Strawberry Line. It is currently considered that this is likely to be an overhead line. Therefore, construction activities could result in the need to temporally divert users. The potential effects identified are not considered likely to adversely affect the usage of the routes due to the short lengths affected and the temporary nature of effects. Post-construction, changes to the visual amenity from views of the overhead lines from the walking/cycling routes would remain. Assuming that standard mitigation measures are adopted, for example screening planting, these are not anticipated to affect the overall number of walkers and cyclists using the paths.

3. The additional connection between the new substation and the existing AT Route could have impacts on the Mendip Spring Golf Course depending on the route selected for thisnew connection. Selection of a new connection route which avoids direct impact to the golf course should be pursued if this option is progressed so as to reduce these impacts to visual effects.

Area of Search 2 – West of Nye Road

Identified area-specific socio-economic impacts for Area of Search 2:

1. The landscape and visual appraisal has identified that views of the new substation and southern most connections will be possible from elevated ground in northern areas of the Mendip Hills AONB. From a socio-economic perspective, the most relevant locations are Dolebury Warren Hill Fort and Banwell Fort which are both more than 1km from Area of Search 2 and proposed connection routes. The magnitude of likely visual impacts from this feature will be assessed in more detail should this option be progressed and at such time the potential for associated socio-economic effects will be considered, although at this time this is considered unlikely.

2. Depending on the exact location associated connections to the new substation for this option, currently anticipated to be overhead lines, mayl cross the Strawberry Line route. This Study area also requires the construction of a new access road from the A368 to the substation. A substation or access road constructed to the rear of Thatcher's Cider factory would also cross a permissive section of the Strawberry Line. Therefore, construction activities for this Area of Study could result in the need to temporally divert users of a permissive section of the Strawberry Line. Post-construction, changes to the visual amenity from views of the overhead lines from the walking/cycling routes would remain and changes to a permissive section of the Strawberry Line route may be required to accommodate a substation or access road on land to the rear of Thatcher's Cider factory. Following standard mitigation such as screening vegetation, these potential impacts are not considered likely to affect the usage of the routes due to the short lengths affected within the overall context of the route to cyclists/walkers and the short period of construction effects.

3. Construction of a new access road from the A368 to the new substation and construction of the substation itself could impact activities at the Thatcher's Cider factory, depending on the selected location for the substation and road. These impacts will be assessed in greater detail should this option be progressed and when more details of possible access route and substation location are available. At this stage it is considered that some short term adverse effects to access to the Thatcher's Cider Factory would occur during construction. Direct loss of the Thatcher's landholding as a result of construction of the substation is anticipated to be avoided where possible. Associated improvements in the access to the local road network have the potential to be beneficial in the long term; however this cannot be confirmed at this stage.

4. The Area of Search is located approximately 1km from the Sandford Hill Mineral Resource Area allocation with proposed connections routed to the north. No impacts on this allocation are anticipated.

5. Proposed connections to the AT, W and Y Routes could result in disruption duing construction and changes to existing visual amenity from sometourist business receptors. These effects are not considered likely to affect the viability of the business and should be minimised by selection of a route which avoids the most valuable tourist and socio-economic features, principally Puxton Farm, and by adopting good construction and mitigation practices.

Area of Search 3 – East of Nye Road

Identified area-specific socio-economic impacts for Area of Search 3:

1. Views of the new substation and southern most connections from elevated ground in northern areas of the Mendip Hills AONB are possible: principally Banwell Fort which is within 1km of Area of Search 3 and proposed connection routes. The magnitude of likely visual impacts from this feature will be assessed in more detail should this option be progressed and at such time the potential for associated socio-economic effects will be considered, although at this time this is considered unlikely.

2. Land uses adjacent to the proposed substation location include agricultural activities, settlement lagoons and reservoirs which are believed to be associated with the Thatcher's Cider factory. At this stage it is not possible to assess the magnitude of likely impacts from potential disruption of economic activities associated with Thatcher's operations during construction. The likely extent of these will be reduced through good construction management techniques and the siting of the substation.

3. Construction of a new access road from the A368 to the new substation could impact activities at the Thatcher's Cider factory or the Strawberry Line, depending on the selected location for the road. An associated connection to the new substation for this option, currently anticipated to be overhead line, would cross the Strawberry Line route These impacts are not anticipated to affect the number of walkers and cyclists using the paths and are likely to be minor negative during construction and following implementation of standard mitigation techniques. Positive longer term impacts are possible as a result of improvements in the local road network.

4. The Area of Search is located approximately 1km from the Sandford Hill Mineral Resource Area allocation with proposed connections routed to the north. No impacts on this allocated are therefore anticipated.

5. Proposed connections to the existing W and Y Routes,which are currently anticipated to be overhead lines, could result in disruption during construction and changes to existing views of the line from socio-economic receptors. These impacts, which are anticipated at this stage to be minor negative, should be minimised by selection of a route which

avoids the most valuable tourist and socio-economic features and by adopting good construction and mitigation practices.

1.7 CONCLUSIONS

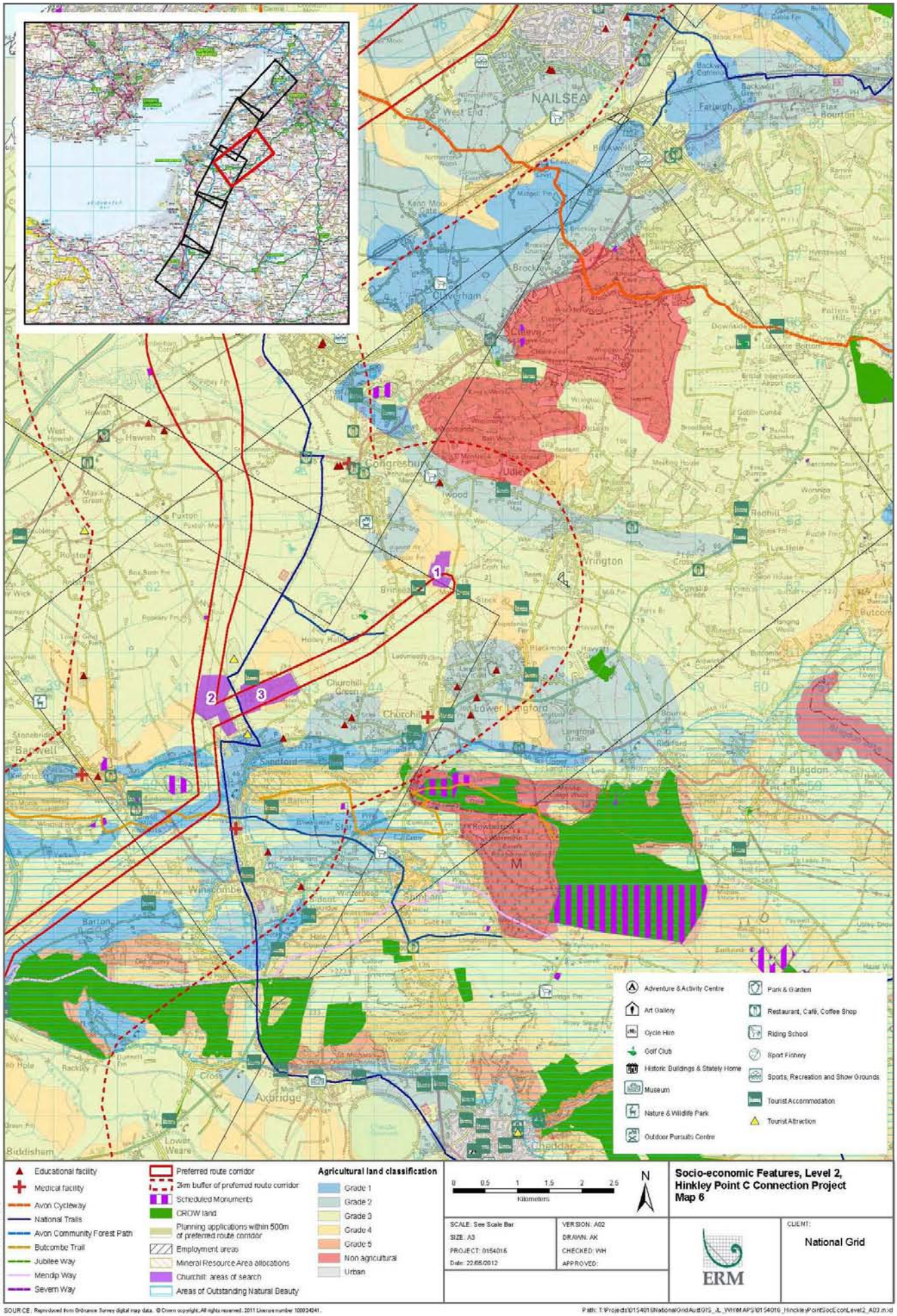
The socio-economic appraisal does not identify difference between the Areas of Search which would be considered to be of sufficient magnitude to be a primary determining factor. It is considered possible to progress all the Areas of Search with minimal socio-economic effects, provided that suitable mitigation measures are integrated into the design and construction.

Area of Search 1 is furthest from the AONB and Thatcher's Cider Factory but will require a greater distance of 400kV line. It is assumed that this will be an overhead line and could have impacts on local tourist features such as Mendip Springs Golf club. Areas of Search 2 and 3 will require a shorter distance of connection lines but have the potential for greater impacts on certain socio-economic resources, principally Thatcher's Cider Factory and the Strawberry Line.

Overall, the balance of socio-economic effects would slightly favour Area of Search 2 due to the reduced impact on the socio-economic features in the immediate vicinity and the reduced requirement for the 400kV connection. The socio-economic effects identified are not considered to present a risk to progression of the development in any of the Areas of Search.

Annex 1

Socio-economic features, Level 2, Hinkley Point C Connection Project for the substation at Churchill/Sandford


NAILSEA
Clevedon
Yatton
Congresbury
Wrington
Churchill
Lower Langford
Sandford
Winscombe
Axbridge
Cheddar
Biddisham
Blagdon
Rowberrow
Adventure & Activity Centre
Art Gallery
Cycle Hire
Golf Club
Historic Buildings & Stately Home
Museum
Nature & Wildlife Park
Outdoor Pursuits Centre
Park & Garden
Restaurant, Café, Coffee Shop
Riding School
Sport Fishery
Sports, Recreation and Show Grounds
Tourist Accommodation
Tourist Attraction
Educational facility
Medical facility
Avon Cycleway
National Trails
Avon Community Forest Path
Butcombe Trail
Jubilee Way
Mendip Way
Severn Way
Preferred route corridor
2km buffer of preferred route corridor
Scheduled Monuments
CROW land
Planning applications within 500m of preferred route corridor
Employment areas
Mineral Resource Area allocations
Churchill: areas of search
Areas of Outstanding Natural Beauty
Agricultural land classification
Grade 1
Grade 2
Grade 3
Grade 4
Grade 5
Non agricultural
Urban
0 0.5 1 1.5 2 2.5
Kilometers
N
Socio-economic Features, Level 2, Hinkley Point C Connection Project Map 6
SCALE: See Scale Bar
SIZE: A3
PROJECT: 0154016
Date: 22/05/2012
VERSION: A02
DRAWN: AK
CHECKED: WH
APPROVED:
ERM
CLIENT:
National Grid
PROJECTION: British National Grid
SOURCE: Reproduced from Ordnance Survey digital map data. © Crown copyright. All rights reserved. 2011 License number 100034041.
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Annex 2

Desk study research on tourism

BASELINE RESEARCH INTO THE VALUE OF TOURISM

Tourism is a traditionally important economic activity in the West of England and considered a priority focus/high growth sector by the West of England Local Enterprise Partnership (West of England Local Economic Assessment December 2011). Furthermore, the number of domestic visitor trips to the South West in 2009 was the highest for all English regions (VisitEngland). In 2008, people working in distribution, hotels and restaurants in North Somerset accounted for 23.5% of the working population which is significantly higher than the South West (20.7%) and national (18.9%) averages (West of England Key Statistics, 2008, Intelligence West).

Data collated for the whole of South West of England indicate that in 2008 (South West Tourism Alliance):

- Visitor related expenditure totalled £9.4 billion;
- 118,014,000 trips were taken to the region (day visitors and those staying overnight combined)

Data collated for the whole of Somerset indicate that in 2009 (South West Research Company):

- Visitor related expenditure exceeded £1.21 billion
- Tourism accounted for 10% of employment within the County
- 17.5 million trips were taken to the County: 14.6 million day trips and 2.9 million staying trips
- Tourists most commonly visited urban or coastal areas

Data collated for the whole of North Somerset indicate that in 2008 (South West Tourism):

- Visitor related expenditure exceeded £272.4 million
- Tourism accounted for 6% of all employment
- 4.6 million trips were taken to the district: 4.1 million day trips and 0.5 million staying trips

BASELINE RESEARCH INTO LOCAL TOURIST RESOURCES AND PREFERRED ACTIVITIES

Within the region, Devon and Cornwall are the most popular tourist destinations; principally coastal and urban areas. The Grand Pier at Weston-Super-Mare is one of Visit England's Top 10 free attractions in England. Of

the largest attractions identified by South West Tourism, those within 5km to the study area are:

- Tyntesfield Estate (National Trust property)
- Noah's Arc Zoo
- The Cheddar Gorge

North Somerset Core Strategy includes a Tourism Strategy which aims to support tourism in the District, most specifically at Weston-Super-Mare.

The Somerset Visitor Survey (2009/10) undertaken by the South West Research Company identified that 21% of visitors had or intended to visit Cheddar Caves and Gorge. No other attractions identified during the survey are located within 5km of the Churchill/Sandford area.

The Somerset Visitor Survey also asked visitors to assign the importance of certain interests/activities to their visit to Somerset. The outcomes of this element are shown below (1 is the highest rank and 9 is the lowest). Walking is the highest ranked outdoor activity with cycling and other outdoor pursuits being lower priorities for tourists to Somerset.

Table 2.1 Ranked Importance of Interests/Activities whilst on holiday in Somerset

	2009/2010	2003
Visiting houses and gardens	5	4
Walking	3	5
Cycling	9	9
Family Entertainment	7	7
Visiting museum	6	6
Food and Drink	2	1
Relaxation (doing nothing)	1	2
Shopping	4	3
Other Activities (eg riding, sailing, golf)	8	8

Source: Somerset Visitor Survey (2009/2010) produced by The South West Research Company for The Somerset Tourism Partnership

LOCAL TOURISM AND RECREATION FEATURES

Local tourism and recreation-related businesses data were obtained through The Post Office from a variety of sources including Royal Mail and Yellow Pages. These data were selected based on business type registrations within 10km of the proposed route corridor. The Post Office tourism business types identified within the 10km study area are shown in Table 1.2.

Table 2.2 Socio-economic Recreation and Tourism Features within 10km of the Churchill / Sandford Areas of Search and Associated Route Corridors

Recreation/tourism Feature	Number of businesses
Adventure & Activity Centre	25
Art Gallery	16
Cycle Hire	1
Golf Club	35
Historic Buildings & Stately Home	3
Museum	12
Nature and Wildlife Park	4
Outdoor Pursuits Centre	19
Park and Garden	7
Restaurant, Café, Coffee Shop	825
Riding Schools	31
Sport Fishery	9
Tourist Accommodation	359
Tourist Attraction	22

1 HINKLEY POINT C CONNECTION PROJECT – LEVEL 2 SOCIO-ECONOMIC APPRAISAL FOR THE ROUTE CORRIDOR STUDY TO THE PROPOSED SANDFORD/CHURCHILL SUBSTATION

1.1 INTRODUCTION

1.1.1 ERM has been appointed by National Grid to undertake a Level 2 Socio-economic Appraisal of four route corridors proposed as options for locating a new 132kV connection between the existing AT overhead line and a proposed substation in the Churchill/Sandford area.

1.1.2 Land to the West of Nye Road has been selected as a preferred location for a new 400kV substation in the Churchill/Sandford area following high level environmental appraisal (including consideration of socio-economics) of three location options. This is described in detail in the Churchill/Sandford Grid Supply Point Substation Siting Study for Public Consultation.

1.1.3 The options for connecting the proposed substation to the existing AT route are described in the Western Power Distribution (WPD) 132kV Route Corridor Study (Report Ref: 1979.096 r04, May 2012) and are shown on Figure 1.1 below.

1.1.4 It is anticipated that the new 132kV connection would be provided through either two 132kV trident wood pole lines or one double circuit 132kV connection on steel lattice towers; however undergrounding the connection is also an option for consideration.

1.2 SOCIO-ECONOMIC BASELINE

1.2.1 National Grid's definition of socio-economics comprises three sub-topics: Economic activity; Traffic and transport; and Aviation and Defence. Traffic and Transport and Aviation and Defence have been scoped out of this Options Appraisal, as anticipated socio-economic impacts in these sub-topics are not considered to offer a noticeable difference between the options. There is likely to be some local economic benefits from construction activities from local expenditure by construction workers. However, this is considered to be consistent across all the route options and is not considered further.

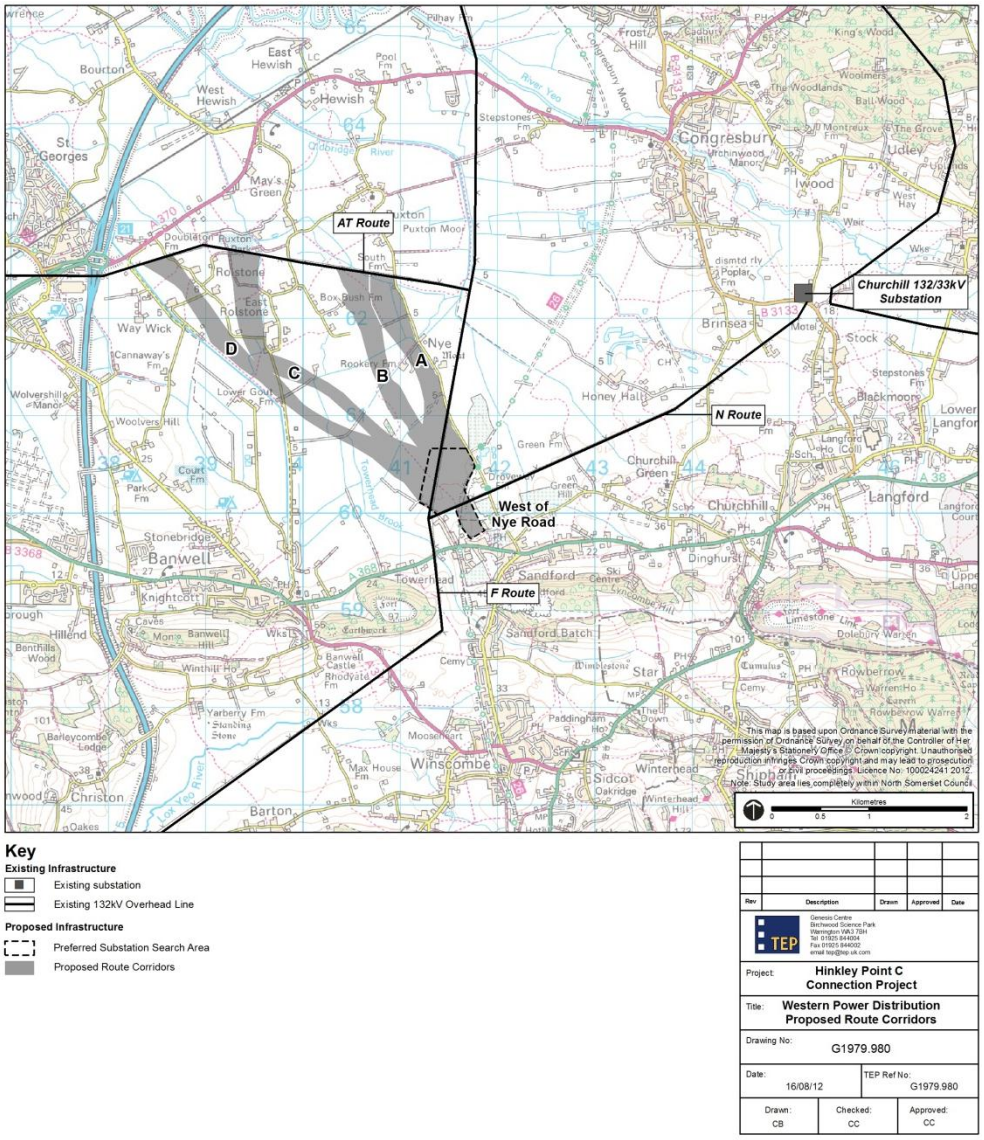
1.2.2 The Economic Activity element of the National Grid assessment methodology requires assessment of strategic land allocations, tourism and recreation features and attractions, and Agricultural Land Classification (ALC)[1] and minerals. Three stages of data collation were undertaken for this assessment*:*

- Collation and mapping of relevant publically available geo-referenced data sets;
- Site visits to the study area to validate desk study data;

[1]The ALC system classifies agricultural land into five grades, with Grade 3 subdivided into Subgrades 3a and 3b. The best and most versatile (BMV) land is defined as Grades 1, 2 and 3a by policy guidance. The available ALC data 2002 for this study does not provide the subdivision of Grade 3 land, so Grade 3 has been used as a proxy for BMV land.

- Desk study research to inform overall socio-economic and policy context of the area.

Figure 1.1 ***Location of Route Corridors A, B, C and D and existing Western Power Distribution Routes***



1.3 GEO-REFERENCED DATASETS

1.3.1 Features located within 10km of the route options were identified and mapped (See Annex 1) from the data sources listed below.

Strategic Land Allocations

- Planning applications within a 500m buffer of the Proposed Route Corridor – Digitised from District Council websites

- Employment allocations from local plans – mapped from Local Plan

Tourism and Recreation Features and Attractions

- Community Facilities (e.g. secondary schools, colleges and hospitals) - Ordnance Survey Address Layer 2. (Reproduced from Ordnance Survey digital map data © Crown copyright 2012. All rights reserved. OS Licence number 0100031673)

- National Walking Routes – Natural England – MAGIC database

- National Cycle Trails – Natural England – MAGIC database

- Public Rights of Way – data provided by Local Authorities covered by Preferred Route Corridor (Sedgemoor, North Somerset, City of Bristol and South Gloucestershire Councils)

- Scheduled Monuments – English Heritage

- National Parks – Natural England – MAGIC database

- World Heritage Sites – English Heritage

- CROW land – Natural England – MAGIC database

- Open Access Land – Natural England – MAGIC database

- Tourism and recreation-related businesses – data obtained from The Post Office from a variety of sources including Royal Mail and Yellow Pages, based on business type registrations within 10km of the proposed route corridor

Agricultural Land Classification

- Agricultural land Classification – Natural England – MAGIC database

Minerals Resources

- Waste and Minerals allocations – mapped from Local Plans

1.4 SITE VISITS

1.4.1 A site visit was undertaken on 25 April 2012 to verify the findings of the desk based assessment, gain additional details of the site context (e.g. brown signed visitor attractions) and to identify additional features of note which may not have been highlighted through the desk study. Those features which are relevant to the study area have been integrated into the baseline mapping in Annex 1.

1.5 DESK STUDY RESEARCH

1.5.1 A review of publically available data sources was undertaken to identify the economic context of the region, the value and nature of tourism in the area, and the most highly visited local tourist resources in the South West of England. The information obtained was drawn primarily from the West of

England Local Economic Assessment, 2011 (West of England Local Enterprise Partnership), the Somerset Visitor Survey 2009/2010 (South West Research Company) and South West Visitors Surveys and Value of Tourism Reports(South West Tourism Alliance).

1.5.2 This background research into tourism is presented in Annex 2 alongside a summary of the Post Office data for tourism and recreation-related businesses.

1.5.3 The Socio-economic study area has on similar studies been defined by the Theoretical Zone of Visual Influence (tZVI). At the time of completing this appraisal the tZVI was not available. Therefore, a conservative approach of collating desk based data for a 10km buffer was undertaken. The site validation surveys identified that due to the local nature of direct impacts of the proposed options, for example potential disruption to current economic activities and possible reduced visual amenity value of the area to tourists, the likely zone of impact would be considerably less than the 10km radius and the primary focus of the assessment was reduced to a 2km area around the route options.

1.6 SOCIO-ECONOMIC BASELINE CONDITIONS

1.6.1 The area in which the route options are located is rural in nature with Sandford and Banwell to the south, Weston-Super-Mare to the west and Congresbury and Yatton to the north east of the four proposed routes. Villages and hamlets are located throughout the study area, the closest being Nye, Rolstone, East Rolstone and Way Wick. All population centres are considered to be of a local scale and include local tourist accommodation, principally Bed and Breakfast and Guest Houses, which are well situated for tourists visiting the Mendip Hills

1.6.2 As shown in Figure 1.1 above, the study area includes other surface infrastructure including the existing Churchill substation and the WPD 132kV F, N and AT Route overhead lines. National Grid are currently investigating options for replacing the WPD F Route with an overhead or underground 400kV transmission line.

1.6.3 The study area is located within The Somerset Levels and Moors; a regional tourist attraction. No internationally important socio-economic features have been identified in the study area. Directly to the south of the Study Area is the Mendip Hills AONB; a nationally designated landscape area and tourism and recreation resource which contains a number of specific regional/local tourism attractions. Specific tourism and recreation resources within 2km of the proposed route options include Puxton Park, Banwell Camp Fort, Locking Castle Golf Course, Puxton Moor Nature Reserve andCourt Farm.

1.6.4 The Strawberry Line walking route, which forms part of Sustrans National Cycle Network Route 26 and is therefore of national importance, passes close to the southern and eastern parts of the corridors for all options where they will connect into the proposed Sandford/Churchill Substation. A permissive stretch of the Strawberry Line crosses the study area in land to the rear of Thatcher's Cider factory. Local Public Rights of Way (PROWs)traverse the whole study area.

1.6.5 Business resources of greatest relevance to the route corridor options are those located on the eastern edge of St Georges and Thatcher's Cider Factory at Sandford.Thatcher's Cider Factory also represents a tourist attraction and is noted as a potentially important contributor to the local economy and employer. Whilst it is recognised there are a number of other employers and business locations in the area, Thatcher's has been considered further given the proximity to the route options.

1.6.6 A mineral resource area allocation is located 500m to the south of Sandford. This represents a regionally important allocation within North Somerset Waste and Minerals Plan.

1.7 SOCIO-ECONOMIC OPTIONS APPRAISAL

All Route Options

1.7.1 Socio-economic resources of relevance to the route corridor have been mapped and are presented in Annex 1.None of the route options directly conflict with the current socio-economic planning or policy context of the study area and impacts on the mineral resource area allocation are not anticipated.

1.7.2 Construction activities and surface infrastructure could reduce the amenity value of the Somerset Levels and Moors and northern areas of the AONB; however the magnitude of this is not anticipated to affect the area's popularity within the context of tourist offerings in the region and the short lengths of connection to be constructed. Construction activities may have temporary minor negative impacts through reduced local amenity value from elevated noise levels and visual intrusion. There may also be localised minor negative impacts on access to business activities, tourism resources and local amenities; particularly Thatcher's Cider Farm, individual farms within the study area, and those in Sandford and Banwell. Post-construction impacts are not anticipated to affect the viability or popularity of these socio-economic resources.

1.7.3 Depending on the location of the substation and associated access road construction activities may result in a need to temporarily divert a permissive section of the Strawberry Line and local PROWS to maintain access. If an overhead line option is selected, open and filtered views of the proposed 132kV line could reduce the visual amenity of the routes. Assuming good construction practice, these potential temporary minor effects are not anticipated to adversely affect the routes' popularity due to the local landscape context with trees and high bushes along sections of the highway network, the short section of the overall walking/cycle routes which are proximal to the overhead lines, the presence of the existing F and W 132kV overhead lines, and potential to implement screening mitigation.

1.7.4 Visual connections could be reduced through selection of Trident Wood Pylons rather than the taller steel pylons. Vegetative screening mitigation could be provided along around key recreational resources (e.g. Puxton Park, Court Farm, Locking Castle Golf Course and Puxton Moor). This would be progressed in accordance with future landscape and visual impact assessment. Alternatively, undergrounding the connection would eliminate any potential visual connections with the connection but would require construction of a cable sealing platform prior to linking with the existing AT overhead line.

All options have the potential to offer localised economic benefit through local expenditure by construction contractors.

1.7.5 Localised temporary minor impacts on some agricultural operations during construction activities may arise. The potential loss of Best and Most Versatile (BMV) agricultural land (ie Grades 1-3a) would be limited to pylon footprints. All route options are located in areas of Grade 3 agricultural land and it is therefore likely that all options will result in the loss of some BMV land. However, the quantum lost will be small, given the small area of the pylon footprints within the overall agricultural context of the area. Should the project be progressed, the development will be required to satisfy Policy 20 of the Bath and North East Somerset, Bristol, North Somerset and South Gloucestershire Joint Replacement Structure Plan (2002).

1.7.6 The features within this assessment are not considered to be affected to a level that represents a significant socio-economic risk to the proposed development within the areas of study.

Route Corridors A and B

1.7.7 Corridors A and B are the shortest and most direct of the proposed routes (both approximately 2km in length) and are therefore likely to have the smallest scale of change on the current visual amenity of the study area. Although these routes pass closest to the Strawberry Line, existing heavy vegetation along the walking and cycling path is likely to screen users from the proposed route corridors.

1.7.8 Corridor A follows the route of Nye Road, with potential greater impacts on socio-economic resources along this road. During construction, disrupted access to Sandford, Puxton and Hewish from Nye Road is more likely as a result of locating the connection within Corridor A. Corridor A also passes closest to Thatcher's Cider Orchards with potential temporary minor impacts during construction activities.

1.7.9 Post-construction, the impact of an overhead or underground line through route corridors A or Bis not anticipated to affect the viability or popularity of any specific socio-economic resources identified through this study.

Route Corridors C and D

1.7.10 Corridors C and D measure approximately 3km and 3.5km respectively and are therefore likely to have a greater scale of change to the current visual amenity of the study area than corridors A and B. Greater construction requirements associated with the longer length of connection are likely to cause disruption to local access routes for a longer duration. However this is also likely to result in greater total expenditure on local amenities by construction contractors.

1.7.11 Corridor C passes through Rolstone and East Rolstone. This is likely to have temporary negative impacts on socio-economic resources within these hamlets due to disruption during construction activities. Corridor C joins the existing WPD 132kV AT overhead line adjacent to Puxton Park and Corridor D

passes closest to Court Farm with potential minor impacts on the visual amenity of these attractions.

1.7.12 Post-construction, the impact of an overhead or underground line through route corridors C and Dis not anticipated to affect the viability or popularity of any specific socio-economic resources identified through this study.

Potential for mitigation

1.7.13 Careful implementation of mitigation measures would be required to ensure that conflicts with North Somerset's tourism strategy and policies relating to the preservation of the Somerset Levels and Moors, BMV agricultural land and the AONB to the south of the study area do not occur. Consultation with Thatcher's Cider is strongly recommended to better understand the likely magnitude and nature of potential impacts to its operations. National Grid has a mechanism to appropriately compensate individuals for temporary loss of crops and for permanent easements for its infrastructure.

1.7.14 There are a number of measures that can be put into place to mitigate the temporary construction impacts on socio-economic receptors in the area. These include:

- Programming construction activities to avoid peak tourism periods.
- Routeing construction traffic to minimise disruption to to local business, tourism and recreation resources.
- Where construction disrupts PROWs andSustrans National Cycle Network Route 26, alternative/ diversionary routes should be provided and clearly signed.
- Adopting good construction practice to minimise noise and dust generation.
- Removing all possible visual connections with overhead power lines by undergrounding the proposed AT-Route as well as the existing N and AT-Route overhead routes.
- Maximising socio-economic benefits by seeking to appoint local contractors and source materials locally.

1.7.15 Planting vegetative screening should reduce the opportunities for visual connections between users of local tourism and recreation resources and proposed and existing electricity infrastructure. Restoration and mitigation techniques should ensure that, post construction, the land along the route corridor is restored to the same quality as prior to construction.

1.8 CONCLUSIONS

1.8.1 The socio-economic appraisal does not identify likely impacts for any of the proposed route corridors which would be considered to be of sufficient magnitude to be a primary determining factor. It is considered possible to progress all of the proposed routes with minor socio-economic effects,

provided that suitable mitigation measures are integrated into the design and construction.

1.8.2 Proposed Route Corridors C and D are least preferable due to the longer length of connection required for these options and their proximity to East Rolstone and Rolstone. Corridors C and D are likely to have additional negative effects on visual connections with Puxton Park and Court Farm, respectively. Corridors A and B are shorter and therefore preferred as they present a smaller scale of change in comparison with the existing situation. Of all proposed route corridors, Corridor B is located furthest from nearby hamlets and access roads and is therefore anticipated to have the least impact on local socio-economic resources.

1.8.3 Overall, the balance of socio-economic effects would favour Corridor B due to the reduced impact on the socio-economic features in the immediate vicinity and the reduced length of required connection. The socio-economic effects identified herein are not considered to present a risk to progression of the development in any of the route corridors.

Annex 1

Socio-economic features, Level 2, Hinkley Point C Connection Project for the Route Corridor Study to the Proposed Sandford/Churchill Substation


Study Area D
Somerset Levels
& Moors North
Study Area
C Mendip
Hills AONB
Wemberham
Cott
Yatton
Pilhay Fm
Frost
Hill
East
Hewish
Pool
Fm
Hewish
River Yeo
Congresbury Moor
Stepstones
Fm
Oldbridge
River
May's
Green
Puxton
Puxton Moor
Doubleton
Fm
South
Fm
Roston
Way Wick
Nye
Moor
Rookery Fm
Lower Gout
Fm
Honey Hall
Green Fm
Churchil
Green
Droveway
Fm
Green
Hill
Towerhead
Brook
A 370
A 368
Towerhead
Sandford
Sandford
Hill
Proposed Substation Corridors
Study area boundaries
Overhead Routes
Green Route
Red Route
Blue Route
Blue Route Alternative
Blue Alternative Avonmouth Route
Underground Cable Route
Orange Route
Brown Route
Cable C
Adventure & Activity Centre
Art Gallery
Cycle Hire
Golf Club
Historic Buildings & Stately Home
Museum
Nature & Wildlife Park
Outdoor Pursuits Centre
Park & Garden
Restaurant, Café, Coffee Shop
Riding School
Sport Fishery
Sports, Recreation and Show Grounds
Tourist Accommodation
Tourist Attraction
Educational facility
Medical facility
National Cycle Routes
National Route (N R)
National Cycle Network Link (NCN)
Avon Cycleway
Regional Public Rights of Way
Avon Community Forest Path
Butcombe Trail
Jubilee Way
Mendip Way
Severn Way
2km buffer of preferred route corridor
National Trails
Scheduled Monuments
Planning applications within 500m of preferred route corridor
CROW land
Mineral Resource Area allocations
Employment areas
Agricultural land classification
Grade 1
Grade 2
Grade 3
Grade 4
Grade 5
Non agricultural
Urban
0 0.1 0.2 0.3 0.4 0.5
Kilometers
N
Socio-economic Features
Hinkley Point C Connection Project
Map 5
Study Area D Somerset Levels and Moors North (b)
SCALE: See Scale Bar
SIZE: A3
PROJECT: 0154016
DATE: 15/08/2012
VERSION: A10
DRAWN: AG
CHECKED: CS
APPROVED:
ERM
CLIENT:
National Grid
PROJECTION: British National Grid
SOURCE: Reproduced from Ordnance Survey digital map data. © Crown copyright, All rights reserved. 2011 License number 100024241.
Path: C:\Users\Andrew.Goh\Documents\Working Documents\0154016NationalGridAustGIS_JL_WH\MAPS\0154016_HinckleyPointConstraintsMaster_A10.mxd

Assessment of locations within the Preferred Area of Search - Land Use and Socio-Economics

1.1 Views of the new substation within the AoS will be possible from elevated ground in northern areas of the Mendip Hills AONB. From a socio-economic perspective, the most relevant locations are Dolebury Warren Hill Fort and Banwell Fort which are both more than 1km from the preferred AoS for the new substation. At this stage it is considered unlikely that the development of a substation within any of the proposed locations within this AoS will affect the functionality or viability of socio-economic resources associated with these assets or any other areas within the AONB. Nonetheless siting the substation within the least environmentally constrained zone (land adjacent to Nye Road) is anticipated to minimise potential impacts on visual amenity as this area is on lower lying land than to the rear of Thatcher's. Despite not having the benefit of industrial buildings in the vicinity, siting the substation in this vicinity would be in a natural dip in the landform and it could be designed to blend in with existing agricultural buildings.

1.2 The Strawberry Line recreational route passes adjacent to the eastern edge of the AoS for a short length along Nye Road. Construction activities may require a temporary diversion of the route with short term negative impacts, particularly if the Land adjacent to Nye Road area is selected for the substation. It is not known at this stage where the existing N-Route will turn into the proposed new substation so likely impacts cannot be assessed in detail at this stage. A permissive stretch of the Strawberry Line crosses land to the rear of Thatcher's Cider Factory. A substation in this area may require a diversion of this permissive stretch of the route.

1.3 The whole AoS is located within Grade 3 agricultural land. The Best and Most Versatile (BMV) agricultural land is defined as Grades 1, 2 and 3a; however distinction between Grade 3a and 3b is not possible at present. Development of a substation anywhere within the AoS has potential to result in the loss of BMV agricultural land and must satisfy local planning policy in relation to protection of BMV agricultural land.

1.4 The AoS also requires the construction of a new access road to the substation. For a substation in land to the north of Mead Lane or adjacent to Nye Road, one potential access option is via Thatcher's Cider Factory premises , with the potential to cause disruption to existing activities at the factory. An access route to the AoS via land to the rear of Thatcher's Cider Factory would need to cross the permissive stretch of the Strawberry Line and the dismantled railway line that is a proposed Strategic Cycle Route. Access from the A368 could also affect the Strawberry Line which runs along the road for a short distance, potentially requiring diversion of users of this recreational route.

1.5 For a substation in land to the rear of Thatcher's Cider, construction of a new access road from the A368 and construction of the substation itself could impact activities at the Thatcher's Cider factory, depending on the exact selected location for the substation and road. Selecting a substation in land to the rear of Thatcher's would therefore be the least preferable of the three substation siting options within this AoS in terms of potential impacts upon the business operations. At this stage

it is considered that some short term adverse effects to access to the Thatcher's Cider Factory would occur during construction. Direct loss of the Thatcher's landholding as a result of construction of the substation is anticipated to be avoided where possible. Associated improvements in the access to the local road network have the potential to be beneficial in the long term; however this cannot be confirmed at this stage.

1.6 Post-construction, changes to the visual amenity from views of the overhead lines from the walking/cycling routes would remain and minor changes to or a diversion of the permissive stretch of the Strawberry Line route may be required to accommodate the access road or a substation on land to the rear of Thatcher's. To mitigate potential impacts, National Grid could invest in enhancing existing vegetation along the route to maintain and potentially improve the visual amenity of the Strawberry Line for users. It is anticipated that post-construction the popularity of this route will not be affected.

1.7 However, following standard mitigation such as screening vegetation, it is not anticipated that any potential impacts will affect the usage of the Strawberry Line due to the short length affected within the overall context of the route to cyclists/walkers and the short period of construction effects. Detailed consideration of likely impacts is required, in consultation with North Somerset Council, Thatcher's Cider and the Strawberry Line Community Group.

APPENDIX 3

ABBREVIATIONS

AIL	Abnormal Indivisible Load
AIS	Air Insulated Switchgear
AONB	Area of Outstanding Natural Beauty
AOS	Area of Search
BMV	Best and Most Versatile
BSP	Bulk Supply Point
CSE	Cable Sealing End Compound
DCO	Development Consent Order
DCLG	Department for Communities and Local Government
DPD	Development Plan Document
DSOR	Distribution System Options Report
EA	Environnent Agency
EDF	Electricite de France
EH	English Heritage
EIA	Environnemental Impact Assessment
ES	Environnemental Statement
FRA	Flood Risk Assessment
GIS	Gas Insulated Switchgear
GSP	Grid Supply Point
Ha	Hectare
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
IPC	Infrastructure Planning Commission
Km	Kilometre
kV	Kilovolt
LDF	Local Development Framework
LEN	Local Electricity Network
LNR	Local Nature Reserve
m	metre/million
MIPU	Major Infrastructure Planning Unit
NETTS	National Electricity Transmission System
NE	Natural England
NG	National Grid
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSC	North Somerset Council
NSIP	Nationally Significant Infrastructure Project
NTS	Not to Scale
OHL	Overhead Line
PINS	Planning Inspectorate
RCS	Route Corridor Study
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SOS	Secretary of State
SLA	Special Landscape Area
SPG	Supplementary Planning Guidance
SSS	Substation Siting Study
SSA	Substation Siting Appraisal
SSSI	Site of Special Scientific Interest
SFRA	Strategic Flood Risk Assessment
TEP	The Environment Partnership
UG	Underground
UK	United Kingdom
WPD	Western Power Distribution