



SP MANWEB

The North Wales Wind Farms Connection Project

Environmental Statement Non Technical Summary

Application reference: EN020014

March 2015



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

Document reference 6.28

North Wales Wind Farms Connection Project

Environmental Statement

Non-Technical Summary

March 2015

PINS Reference: EN020014

Document Reference: 6.28

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

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Regulation 5(2)(a)

The North Wales Wind Farms Connection Project

Environmental Statement

Non-Technical Summary

Document Reference No.	6.28
Regulation No.	Regulation 5(2)(a)
Author	Gillespies
Date	March 2015
Version	01
Planning Inspectorate Reference No.	EN020014

INTRODUCTION

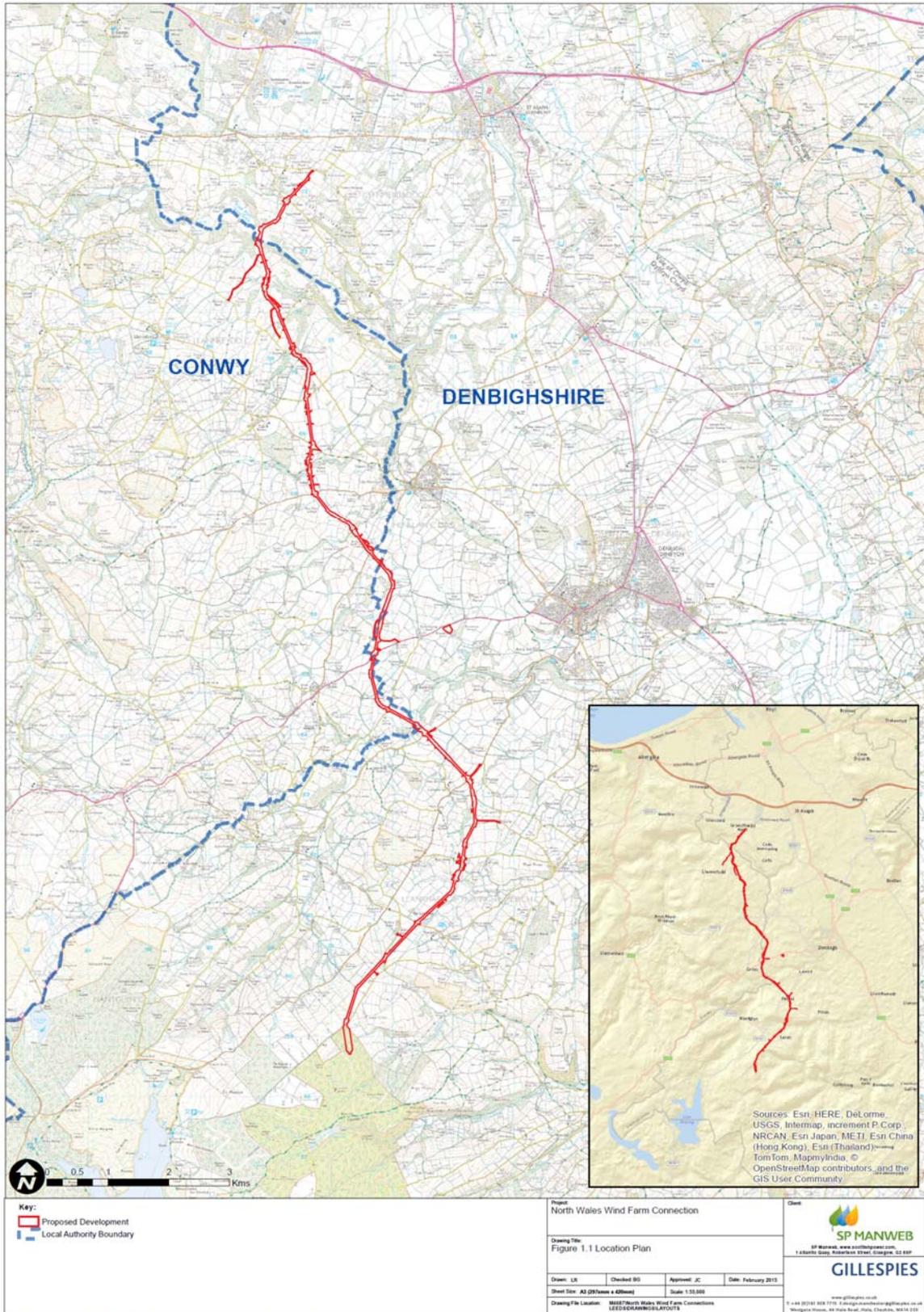
General Introduction

- 1 This document provides a non-technical summary of the Environmental Statement (ES) which accompanies an application by SP Manweb plc (SP Manweb) under the Planning Act 2008 (the "Act") for the North Wales Wind Farms Connection Project Development Consent Order (the "DCO").
- 2 The DCO would grant powers to construct, operate and maintain a new 17 kilometre (km) 132,000 volt (132 kV) Overhead Line from the proposed North Wales wind farm Collector Substation near Clocaenog Forest and which terminates in a field to the south of Trebanog, Groesffordd Marli, which is located 1.8km from St Asaph substation. It is located in North Wales and crosses the administrative boundaries of Denbighshire County Council and Conwy County Borough Council (see 'Location Plan' below).
- 3 The Proposed Development, being an electric line above ground with a voltage of greater than, or equal to, 132 kV is classed as a Nationally Significant Infrastructure Project (NSIP). Under Section 37 of the Planning Act 2008, the consenting process requires an application to be submitted for a Development Consent Order (DCO).
- 4 The ES presents the findings of an assessment of the likely significant effects of the Proposed Development on the environment and explains the measures used to avoid, reduce or compensate for likely significant adverse (negative) effects.

The Applicant

- 5 SP Manweb is the Distribution Network Operator (DNO) and holds the Electricity Distribution License (issued under the Electricity Act 1989 (the 1989 Act) for the electricity network in North Wales. The electricity network in this region is managed and maintained on SP Manweb's behalf by Scottish Power Energy Networks (SPEN).
- 6 Under condition 16 of its distribution license SP Manweb is required to provide a connection to its distribution network as and when it is asked to do so by any of its customers.
- 7 When putting together new proposals to distribute electricity, SP Manweb is required, under the terms of the Electricity Act, 1989, to have regard to the desirability of preserving the environment and to do what it reasonably can to reduce the effects on the environment.

Location Plan



Project Need

- 8 SP Manweb has an agreement with the developers of four onshore wind farms (Clocaenog Forest, Brenig, Nant Bach and Derwydd Bach) to provide them with a new connection to the distribution network.
- 9 This statutory requirement is the reason for SP Manweb seeking consent to construct and operate the Proposed Development. Under the terms of its licence SP Manweb has to provide the connection from 2017.
- 10 Following technical, economic and environmental studies and options appraisals, SP Manweb proposes that the best option would be to build a 132 kV overhead electricity line between the proposed Collector Substation at Clocaenog and a terminal pole located south of Glascoed Road, B5381. This new connection is referred to as the Proposed Development.
- 11 An explanation of the need for the Proposed Development is provided in Chapter 2 of the Environmental Statement (ES).

The Proposed Development

- 12 The Proposed Development includes the following principal elements:
- Construction of a 17km 132kV overhead electricity distribution connection between Clocaenog Forest and St Asaph, both in Denbighshire;
 - A temporary construction compound at Broadleys Farm, A453, Denbighshire and temporary storage or 'laydown areas' along the alignment, without which the overhead line could not be constructed;
 - Access points for pedestrians and vehicles along the length of the Proposed Development for the duration of construction, without which the overhead line could not be constructed;
 - Mitigation planting, and;
 - Other integral works such as site preparation and clearance, earthworks, alteration of existing services, vegetation removal/planting and minor street works.
- 12 The Order Limits for the Proposed Development also includes land from an un-named highway to the south of Trebanog, Groesffordd Marli to the terminal point of the 132 kV Overhead Line. The DCO includes the rights to install (and keep installed), retain, use, inspect, maintain, renew, remove and relocate an underground cable in this land.
- 13 The 132 kV Overhead Line would comprise conductors supported by double wood poles. The wood poles are generally no larger than 470mm in diameter, and would range between 11m and 16.6m in length. Taking into account that the nominal depth of the poles is 2.5m and the steel bracings and insulators add typically 2.3m to the length, the net result is that the actual conductor height above ground (at pole positions) is about 0.2m less than the pole length referred to. The average span between poles is 79m.

- 14 The Order Limits for the Proposed Development contain a Limit of Deviation (LoD) within which the 132kV Overhead Line would be located. The LoD provides a degree of flexibility to ensure that any environmental constraints, technical constraints or landowner requests can be accommodated. The LoD varies between 20m in areas with good ground conditions and 40m in areas with poor ground conditions.

The Wider Scheme

- 15 The Proposed Development does not include all elements of the North Wales Wind Farms Connection Project. This is because the following elements are considered to be "Associated Development", which, in Wales, cannot be included in an application for a development consent order. Those elements not included within the Proposed Development are known as the Wider Scheme and comprises:
- proposed works to St Asaph substation, including the development of an underground cable taking the connection point at St Asaph to the terminal point of the Proposed Development located in a field to the south of Trebanog, Groesffordd Marli (which is south of Glascoed Road, B5381);
 - a new 132 kV electrical substation at Clocaenog Forest to act as the collector substation for four consented wind farms;
 - temporary storage areas within the existing St Asaph substation and the Collector Substation at Clocaenog Forest; and
 - diversions of existing of lower voltage overhead line crossings.
- 16 A planning application for the proposed Collector Substation has been submitted to Denbighshire County Council.
- 17 The 2.2km section of new underground cable between the end of the 132 kV Overhead Line to the existing St Asaph substation is considered to be permitted development for SP Manweb under the Town and Country Planning (General Permitted Development) Order 1995. SP Manweb is discussing this with Denbighshire County Council to confirm the use of permitted development rights in respect of the underground cable.
- 18 The works to the existing St Asaph Substation itself include the installation of electrical plant, equipment and switchgear are within the existing substation compound. This is permitted development for SP Manweb under the Town and Country Planning (General Permitted Development) Order 1995.

EIA Scoping and Consultations

- 19 The scope of the EIA was identified through early engagement with stakeholders and iteratively throughout the project development process.
- 20 A Scoping Report¹ identifying the potential for environmental effects and explaining how SP Manweb proposed to assess them was submitted to the Secretary of State in January 2014 asking for a 'Scoping Opinion'.

¹ DCO Document Ref 6.29

- 21 In response, and following consultation with statutory bodies, PINS issued its Scoping Opinion² in February 2014, providing commentary from the Secretary of State that confirmed the topics to be included in the ES.
- 22 As part of the statutory Stage 3 consultation process, SP Manweb published a Preliminary Environmental Information Report³ (PEI Report) in March 2014. Responses to this consultation helped to guide the EIA process.

Policy and Legislation

- 23 As an NSIP, the DCO for the Proposed Development will be determined by the Secretary of State for Energy and Climate Change in accordance with three National Policy Statements (NPSs).
- *Overarching National Policy Statement for Energy EN-1⁴ (NPS EN-1)* - Recognises that new high voltage distribution lines could have significant effects on the environment. It sets out the assessment principles that must be followed by applicants and the topics that must be assessed.
 - *National Policy Statement for Renewable Energy Infrastructure⁵ (NPS EN-3)* - refers to the grid connection needs of an onshore wind farm, recognising that most onshore wind farms are connected into the local distribution network at voltages of 33 kV, 66 kV or 132 kV;
 - *National Policy Statement for Electricity Networks Infrastructure⁶ (NPS EN-5)* - Sets out additional assessment principles which are specifically related to electricity infrastructure projects. These focus on climate change 'proofing'; biodiversity and geological conservation; landscape and visual effects; and noise and vibration effects.
- 24 Identification and assessment of potential environmental effects has informed the location and design of the Proposed Development throughout its evolution.
- 25 NPS EN-5 also requires applicants to demonstrate good design in respect of landscape and visual amenity and in the design of the project to mitigate likely significant adverse effects. NPS EN-5 notes that existing rules for the routing of overhead lines (known as 'the Holford Rules') should form the basis of the approach to routing overhead lines.

² DCO Document Ref 6.30

³ www.nwwindfarmsconnection.co.uk

⁴ Department for Energy and Climate Change : Overarching Energy National Policy Statement (EN-1): July 2011

⁵ Department for Energy and Climate Change: National Policy Statement for Renewable Energy Infrastructure (EN-3): (July 2011)

⁶ Department for Energy and Climate Change: National Policy Statement for Electricity Energy Infrastructure (EN-5): July 2011

- 26 SP Manweb has used the Holford Rules in designing the route of the Proposed Development. Taking into account the Holford Rules, as well as technical, financial and other environmental considerations, SP Manweb has avoided potential effects on the Clwydian Range and Dee Valley AONB by selecting a route to St Asaph. In addition, SP Manweb has made changes to its Proposed Route Alignment⁷ to avoid visual effects, including on the village of Henllan.
- 27 The ES also refers to Planning Policy Wales (Edition 7, July 2014) and to local planning policies which set out the protection that should be given to aspects of the environment. Reference has been made to these policies in considering the sensitivity of the environment affected by the Proposed Development and the importance of effects. Chapter 5 of the ES presents a summary of national and local planning policy relevant to the Proposed Development. Specific planning policies relevant to the environmental topics covered in the ES are summarised in the specialist topic chapters.

The Environmental Statement

- 28 The purpose of Environmental Impact Assessment (EIA) is to identify, describe and assess the likely significant effects of the Proposed Development on the environment. It also helps identify mitigation measures to avoid, reduce or compensate for identified adverse effects. The results of the EIA are presented in the Environmental Statement (ES).
- 29 The ES has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment Regulations) 2009 (as amended).

BACKGROUND TO THE PROJECT AND ALTERNATIVES CONSIDERED

- 30 The North Wales Wind Farms Connections Project: Strategic Options Report⁸ details the strategic options for the development of an overhead line, which SP Manweb investigated.
- 31 This report concluded that the preferred option was for a connection to the existing St Asaph Substation. This option had the shortest 132 kV connection of all the technically viable options. This meant that both potential environmental impacts and costs were minimised. This option also had the benefit that potential routes would avoid significant environmental constraints such as the Snowdonia National Park or the Clwydian Range AONB.

⁷ The Proposed Route Alignment was the 1km wide corridor that formed the basis of the Statutory Consultation

⁸ North Wales Wind Farms Connections Project: Strategic Options Report (March 2015)

- 32 The next step was to decide whether the connection should be by overhead line, supported by steel towers, wood poles or by underground cable. The appraisal concluded that although a number of options were technically feasible, an overhead line supported by wood poles was the most economic and created fewer environmental effects than a steel tower. Underground cabling of the connection was considered but the benefits were not considered to outweigh the additional costs and therefore it would not meet the criteria in National Policy Statement for Electricity Networks Infrastructure (EN-5) (NPS EN-5).
- 33 Following the identification of the preferred strategic option, five potential route corridors were identified. Route corridors are linear areas of land approximately 1km wide, through which a new connection may potentially be routed. SP Manweb assessed the relative merits of the five route corridors against a range of environmental and technical factors. The assessment was also informed by the feedback from the Stage 1 Consultation as described in the Consultation Report (March 2015) 9.
- 34 The Preferred Route Corridor selected was considered likely to cause the least impact on the landscape, including the Clwydian Range and Dee Valley Area of Outstanding Natural Beauty (AONB), would comply most closely with guidance provided by the Holford Rules and would minimise effects on the historic environment and ecological receptors. A relatively wide corridor was identified to allow identification of options for aligning the proposed overhead line.
- 35 The Stage 2 Consultation was designed to gather additional information on the Preferred Route Corridor to in order to help shape the Proposed Route Alignment for the statutory stage of consultation on the Proposed Development. This was carried out between June 2013 and July 2013 and the results are presented within the Consultation Report (March 2015).
- 36 In response to a number of comments received regarding the potential environmental effects on the village of Henllan, further analysis was undertaken to determine whether the route could be moved further away from Henllan. It was concluded that this could be achieved by an alternative which deviated from the Preferred Route Corridor at Eriviat Park, turning north-west and passing through pastureland in the direction of Hafod Wood, before turning north and re-joining the Preferred Route Corridor north of Berain, at Tyddyn Bartley. This option, via Hafod, was considered to be both technically and environmentally feasible.
- 37 The Proposed Route Alignment (the 100m wide corridor that formed the basis of the statutory pre-application Stage 3 Consultation) was developed within the Preferred Route Corridor (via Henllan) with an option through Hafod. Both the Henllan and the Hafod options were considered in the Preliminary Environmental Information Report (March 2014)¹⁰ and were taken forward to the Stage 3 Consultation.

⁹ DCO Document Ref 5.1

¹⁰ North Wales Wind Farm Connections Project: Preliminary Environmental Information Report (March 2014); SP Manweb; www.nwwindfarmsconnection.co.uk

- 38 In response to the representations received during the Stage 3 Consultation and, taking into consideration environmental and technical factors, the Proposed Route Alignment via Hafod was selected as the preferred option.
- 39 Consultation feedback identified a number of locations which were then looked at in greater detail. These included:
- Tir Mostyn Ridge – feedback identified the potential for the route to skyline along this ridge;
 - Tan-yr-Allt – feedback identified the close proximity of the poles to this property;
 - Pandy Wood – feedback identified potential effects on-designated heritage assets;
 - Hafod Farm Approach - feedback identified potential skylining;
 - Berain Farm – feedback identified proximity to listed buildings;
 - Elwy Valley and Cefn Meiriadog- feedback identified potential skylining; and
 - Cable route from the terminal pole to the existing St Asaph Substation.
- 40 The review resulted in a number of minor changes and identification of the Order Limits which have been evaluated as part of the EIA process.

DESCRIPTION OF THE PROPOSED DEVELOPMENT

Baseline Context

- 41 The Proposed Development is located primarily within a rural agricultural area. At its southern end is Clocaenog Forest, an area of managed forestry. From here the proposed overhead line would run northwards through a farmed pastoral landscape. Field sizes increase northwards and scattered mature trees, hedgerows and woodland become more prevalent. At the Afon Elwy the route crosses an area of deciduous woodland before passing through agricultural fields to a position just south of Glascoed Road, Cefn Meiriadog. Properties are scattered, with Henllan being the largest village in the vicinity. Estate and parkland character is evident such as at Eriviat Park with its estate fencing, lime avenue and holly hedges. Main roads in the wider area include the A525, A55, and A543, which link the towns of St Asaph, Denbigh and beyond. The remaining road network comprises mostly minor and unclassified roads which connect to the main roads.

The Proposed Development

- 42 The Proposed Development includes the following components:
- 17km 132 kV single circuit overhead line on double wood pole supports, between Clocaenog Forest and a terminal pole located south of Glascoed Road, B5381, near to St Asaph;
 - temporary construction working areas which vary in width to allow for construction in areas with poor ground conditions and for locating the equipment necessary for pulling the conductors;
 - access points from the road network to enable the construction, maintenance and decommissioning of the overhead line;
 - a temporary construction compound at Broadleys Farm;
 - areas for tree and hedgerow planting; and
 - ancillary works such as scaffolding, laydown areas and site preparation works without which the overhead line could not be constructed.
- 43 The 132 kV overhead line would be constructed using double wooden poles.
- 44 The 132 kV overhead line would terminate south of the Glascoed Road (the B5381). From the St Asaph Substation an underground cable would connect, via existing highways to the terminal point of the overhead line. As explained in the introduction to this NTS, the proposed Collector Substation, the section of underground cable and the works at the existing St Asaph substation do not form part of the application for a DCO.

Order Limits and Limits of Deviation

- 45 The Proposed Development will be carried out within the 'Order Limits', which are shown on the Works Plans (DCO Document Ref 2.3) as a red outline. The Order Limits define the area within which any aspect of the Proposed Development may be carried out, including for construction and access. The Order Limits are typically approximately 40m wide, widening to 60m where for example a wider area is required for construction due to poorer ground conditions, or the 132 kV Overhead Line changed angle. There are also areas where the Order Limits are widened for the purposes of tree planting. The the 132 kV Overhead Line itself would be located within the LoD for the overhead line varying between 20m in areas with good ground conditions and 40m in areas with poor ground conditions.
- 46 Some components are fixed in the positions marked on the Works Plans, such as the construction compounds and construction accesses off the public highway. Other components/ activities may be sited anywhere within the Order Limits and have been assessed as such in the ES. These include: activities such as scaffolding for road crossings; temporary laydown areas and the storage of topsoil.

Design Flexibility

- 47 The Proposed Development would be carried out within Limits of Deviation (LoD) which would provide necessary flexibility as to the final alignment of the works. The Limits of Deviation identify a maximum distance or measurement of variation within which these works must be constructed. This is because, following the making of the DCO, micro-siting may take place in response to detailed technical survey information, particularly for unconfirmed ground conditions and/or minor alterations requested by landowners.
- 48 The assessments have been carried out on the basis of the reasonable worst case scenario that might arise as a result the Proposed Development moving within the Limits of Deviation.
- 49 The Order Limits and the Limits of Deviation are illustrated below. Further detail is included within Chapter 2 of the ES.

Construction of the Proposed Development

- 50 Construction would commence with the preconstruction enabling works including any necessary improvements to the existing road network to facilitate construction access and activities and any undergrounding or diversion of lower voltage overhead line. Tree and vegetation removal would be undertaken where required. At its northern end the 132 kV overhead line route runs parallel, and relatively close, to an existing 33 kV overhead line. Where the overhead line crosses roads, precautionary works would be required. Over major roads (A and B-class roads dependent on usage) temporary scaffolds would typically be used.
- 51 Details of all these works are set out in Chapter 2¹¹ of the ES.
- 52 Site set-up works would include the establishment of a construction compound at Broadleys Farm, incorporating temporary secure storage areas, contractor's cabins and welfare facilities to house the staff, equipment and materials for the works. Any topsoil and subsoil excavated would be stored separately in accordance with the Construction Environmental Management Plan (CEMP) (see Appendix 2.1 to Chapter 2 of the ES) so that it can be put back once construction activities were completed. The construction compound would be in use for the duration of the construction.
- 53 Temporary storage areas would also be provided at the existing St Asaph substation and at the proposed Collector Substation at Clothaneog (not part of the DCO application), but the overhead line could not be constructed without the compound at Broadleys Farm.
- 54 The poles would be transported from Broadleys Farm, the existing St Asaph substation and the Collector Substation to their required locations by general purpose vehicles with incorporated lifting devices. The conductors would be delivered to site on cable drums using general purpose vehicles and would be installed in sections between tension poles using tensioning and pulling machines.

¹¹ DCO Document Ref 6.2

55 Generally the sequence for construction 132kV overhead lines on double wood poles is as follows

Pre-Construction Enabling Works

- Tree trimming;
- Undergrounding or diversion of lower voltage overhead line crossings;
- Alterations to the existing road network if required;

Site Set Up;

- Establishment of secure storage area, welfare cabins, and temporary offices;
- Construction of temporary site access points where required;
- Erection of temporary works access signing and access route signing;
- Construction of temporary stone haul roads;
- Scaffolding of road crossings;
- Construction of hard stands for winches.

Delivery of materials to site;

Pole Erection and Conductor Stringing;

- Excavations for foundations;
- Dressing and erection of poles;
- Installation of temporary stays;
- Running out of conductor pulling bonds;
- Installation of insulators and conductors;
- Commissioning.

Demobilisation;

- Removal of welfare cabins, temporary offices, work compounds and storage areas;
- Removal of temporary access tracks, working areas and demarcation zones, and reinstatement of fields;
- Removal of temporary access points and signing;
- Reinstatement of verges & hedgerows.

56 Overhead line conductors are usually erected from one end of the overhead line in short sections. Works are carried out sequentially and plant would move from one location to the next until stringing is completed.

- 57 Once the overhead line is constructed, the temporary access tracks and working areas at the pole sites would be removed and the ground reinstated by removing stone and trackways. Any hedgerows lifted in order to provide temporary access would be put back within 48 hours and fences and gateways, which may have been altered to accommodate the construction traffic, reinstated.
- 58 Should development consent be granted, SP Manweb intends to start construction in summer 2016 and the construction period would last for 16 months.

EIA APPROACH AND METHODOLOGY

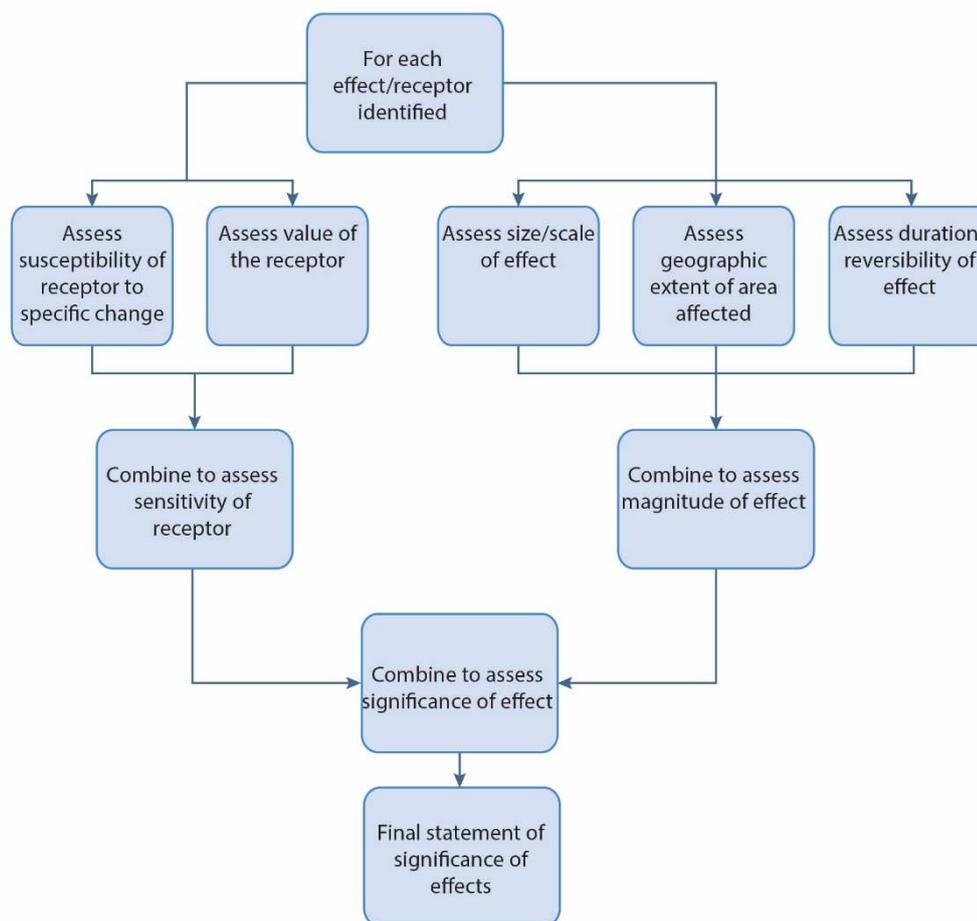
Embedded Mitigation

- 59 The aim of the EIA process has been to integrate environmental considerations into the design process so that potential effects can be considered and avoided or minimised at the earliest stages. This is referred to as 'embedded mitigation'. Embedded mitigation also includes a series of construction and management methods which are intended to ensure that potential environmental effects are avoided or reduced as far as possible. These are set out in the Design and Construction Report (DCO Document Ref 7.1) and Construction Environmental Management Plan (CEMP) at Appendix 2.1 of the ES. The assessment of likely significant effects within the topic chapters of the ES has assumed these mitigation measures were all in place and effective.
- 60 The embedded mitigation measures include:
- selecting a wood pole structure rather than a steel tower;
 - routing in accordance with the Holford Rules to avoid environmentally sensitive areas, including designated landscapes, residential properties, locally important landscapes, floodplains, local recreational routes and sites, valuable wildlife and cultural heritage sites and wherever possible, woodlands and mature trees;
 - optimising opportunities to backcloth the overhead line;
 - minimising need for angle poles;
 - by undertaking extensive consultation and using the feedback to inform the design development;
 - developing a route to the west of Henllan in response to the consultation;
 - avoiding areas where significant effects were identified during the preliminary assessment, including re-alignment of the route at Tan Yr Allt, Pandy and Hafod;

- balancing effects along the ridge line at Tan Yr Allt to minimise effects on receptors close to the ridge;
- through coppicing rather than removing woodland wherever possible; and
- adoption of the measures within the CEMP. These are secured through a requirement in the draft DCO

Assessing Significance of Effects

- 61 The EIA Regulations refer to projects likely to have significant impacts or effects on the environment. This means that identifying and describing the impacts or effects of a project is not sufficient. They must also be assessed for their significance. This is a key part of the EIA process and is an evidence based process combined with professional judgement. It is important that the basis of such judgements is transparent and understandable, so that the underlying assumptions and reasoning can be understood by others. A step by step approach such as that illustrated below should allow the identification of likely significant effects to be as transparent as possible.
- 62 To assess the overall significance of an effect on the environment, the EIA considers the nature or sensitivity of a receptor (including people) to the type of change arising from the specific type of development being proposed and the nature or magnitude of effect.
- 63 The Study Area is the geographical area within which the Proposed Development has the potential to give rise to environmental effects. Each specialist topic chapter has described the extent of the Study Area(s) used for the assessment and makes reference to figures for illustration. The extent of the Study Areas varies across topics and is dependent upon the nature of the potential effects.



Assessing the Significance of Likely Effects

Specific Mitigation Measures

64 In addition to embedded mitigation, specific mitigation measures are proposed to remove or reduce significant environmental effects identified through the assessment process to an acceptable level. These measures are described in the specialist topic chapters. The assessment of residual effects takes account of these specific mitigation measures.

Cumulative Effects

65 As well as the assessments of particular topic areas the EIA assess the potential for any likely combined effects. An assessment has also been undertaken of the potential for cumulative effects with other projects. The cumulative assessment has been undertaken in two stages:

- Stage 1 – potential effects of the Proposed Development, the Wider Scheme and the Wind Farms; and
- Stage 2 – Stage 1 and other planned developments in the area.

ASSESSMENT OF ENVIRONMENTAL EFFECTS

66 The remainder of the NTS provide a brief summary of the main findings of the EIA process, which are presented in full within the specialist technical chapters of the ES.

ECOLOGY AND BIODIVERSITY

67 Chapter 6¹² of the ES describes the assessment of the likely significant ecological effects arising from the Proposed Development and includes a description of mitigation measures to avoid or reduce effects.

68 As no internationally designated nature conservation sites would be significantly affected by the Proposed Development, it was agreed with NRW that a Habitats Regulations Assessment in accordance with The Conservation of Habitats and Species Regulations 2010 was not required. This is explained in the No Significant Effects Report which accompanies the application for a DCO¹³.

69 A phased approach was taken in identifying the ecological interest of the area. This involved desk based study and a range of surveys, starting in 2013. An extended Phase 1 Habitat Survey was undertaken in 2013 / 2014. Consultation was undertaken throughout and information was also gained from survey reports for other planning applications, from wildlife monitoring reports and from targeted surveys.

70 The study area was surveyed for the presence of amphibians, badger, bats, birds, dormice, hares, reptiles and water voles.

Ecological Baseline

Designated Sites, Habitats and Fauna

71 There are no designated sites within the Order Limits.

72 Thirty three non-statutory Local Wildlife Sites (LWS) lie within 2km, six of which are, at least in part, within the Order Limits for the Proposed Development.

73 Much of the study area was recorded as improved and semi-improved grassland of low ecological value. There are a few small fields bounded by hedgerows, which again are typically of low ecological value. Woodland habitats, including broad-leaved, mixed and yew woodland are common and many are designated as Local Wildlife Sites. There is one conifer plantation (Clocaenog Forest) at the southern end of the Order Limits. Mature trees are prevalent, both within hedgerows and woodlands, although most are not ancient or veteran. There is a comprehensive network of hedgerows, with the exception of the higher ground at the southern end of the Order Limits. Many are relatively large and mature and a number were assessed as 'important'. The majority, however, were species poor.

¹² DCO Document Ref 6.6

¹³ DCO Document Ref 5.7

- 74 A number of ponds were present along the route and several small streams and rivers, many of which were in wooded valleys.
- 75 In terms of fauna, the species that were identified as valued ecological receptors and which were taken forward to the impact assessment phase included great crested newt, dormice, bats and common lizard.

Assessment and Prediction of the Importance of Likely Residual Effects

- 76 Much of the area is dominated by improved grassland and consequently is generally of low ecological value. However, there are some valuable habitats and species which could, potentially be impacted during construction, decommissioning and to a lesser degree by the Proposed Development during the operational phases. Embedded mitigation in the form of careful routing and the adoption of good working practices in accordance with the CEMP should ensure that designated sites and specific features, which are particularly sensitive to overhead lines are not affected or that effects are reduced to acceptable levels.

Construction/ Decommissioning Effects

- 77 The Proposed Development would have medium-term effects on valued ecological resources arising from vegetation clearance, wildlife displacement and exclusion for the construction period of approximately 16 months, followed by a period of habitat re-establishment during which time ecological functions would gradually recover. The principal medium-term effects would be loss of mature trees, tree groups and species-rich hedgerows. Hedgerows and trees and would be replanted but would regain ecological diversity functions only in the long-term.

Designated Sites

- 78 There are no predicted effects on any internationally or nationally designated sites.
- 79 Local Wildlife Sites with ancient woodland, a habitat considered important at a County level, would be irreversibly affected by the Proposed Development. However, the area of impact would be small and tree species would be retained albeit in a rotation coppice management regime. As the replacement planting matured, these effects would be minor adverse significance.

Habitats

- 80 Although the Proposed Development has avoided impacts on woodlands and trees wherever possible, some felling would be inevitable and would be permanent and irreversible. Other trees and areas of woodland along the route would have to be managed for public health and safety reasons. SP Manweb would replant felled trees at a ratio of 2:1. Over time, as the replacement planting matured, these effects would be minor adverse significance.
- 81 Some areas of broad-leaved woodland would be changed into a scrub-type habitat. Important at a district level and reversible in the longer term, the effects are predicted to be negligible.

- 82 The majority of hedgerow loss would be temporary and the length of hedgerow which would be permanently lost would be relatively short. New hedgerow would be planted and the residual impact would in time be negligible.

Fauna

- 83 Great crested newts were identified in four ponds within 500m of the Proposed Development, in each case as small populations. The impact is predicted to be negligible/minor adverse and a European Protected Species Licence should not be required.
- 84 Dormouse is a key species, difficult to survey but present at several sites where it has not previously been recorded. The assumption is that this species could be more widespread than previously believed and there may be suitable habitat throughout the Proposed Development area. By changing woodland to coppice scrub as part of the mitigation proposals, the impact would be of minor beneficial significance. A European Protected Species Licence would be required.
- 85 No bat roosts are known to be present although there are mature trees with bat roost potential and additional survey work would be undertaken to confirm this prior to construction. If bats roosts were found, artificial roosts would be installed and there would be no detriment to the local population. The impact is predicted to be negligible.
- 86 At the southern end of the Order Limits, the effects on common lizard of loss of habitat and injury or accidental killing are predicted to be of minor adverse significance.
- 87 The ES acknowledges a potential impact on badgers; pre-works surveys would be required. If a badger sett was occupied then it may need to be excluded or work practices changed to ensure an acceptable level of disturbance.

Operational Effects on Valued Ecological Resources

- 88 Once installed, no further habitat loss or severance effects further to those assessed under the construction phase would be likely to occur. Habitats sown and planted in reinstated construction areas would continue to establish and naturally colonise.
- 89 The main effect on biodiversity during operation relates to the vegetation management along the route of the overhead line. Prior to the mitigation being carried out, this could adversely affect species including GCN, dormouse and badger through temporary disturbance or accidental injury/ killing. The effects are predicted to be minor adverse and minor to moderate adverse in the case of dormice.
- 90 Once overhead lines are constructed they present a potential hazard as a collision risk for birds. Certain bird species, because of the way they fly, are less able to avoid overhead lines and the electrical connection therefore poses a threat. For the Proposed Development the effects are predicted to be negligible since very few high risk species were identified in the desk study or during the surveys.

Cumulative Effects

- 91 The cumulative assessment is provided in Chapter 6. None of the predicted cumulative effects are greater than the predicted effects identified described above.

Chapter 7: LANDSCAPE AND VISUAL

- 92 Chapter 7¹⁴ of the ES describes the assessment of the likely significant landscape and residential amenity effects resulting from the Proposed Development and includes a description of mitigation measures to avoid or reduce effects.
- 93 A Zone of Theoretical Visibility (ZTV) identified areas from which the Proposed Development may theoretically be visible to a distance of 10km. In addition, 30 representative viewpoints (see Figure 7.3 of the ES) and an assessment of views from all residential properties within 200m of the proposed 132 kV Overhead Line was undertaken. The viewpoint photographs and illustrative photomontage images with accompanying plans and wireframes are illustrated in Appendix 7.3 of the ES. These selected viewpoints are a representative selection of the more sensitive viewpoints. As such, other receptors (of a similar type) are likely to experience visual effects of similar or lesser significance.

Landscape and Visual Baseline

- 94 Much of the study area consists of undulating or sloping pastures bounded by hedgerows, post and wire fences and mature hedgerow trees interspersed with mixed woodland blocks and strips. It includes scattered residential properties, small hamlets, farmsteads, and small settlements, incised with wooded stream and river valleys, and upland ridges to the south of the Order Limits. There is a network of transport routes (lanes and roads) and footpaths, and there are leisure and recreational facilities. There are a number of lower voltage overhead lines, although these typically form a small part of any views.
- 95 The main public views across the wider study area are experienced by visual receptors using the Clwydian Way Regional Trail and the North Wales Pilgrim's Way long distance footpaths, local public rights of way, public open spaces, outdoor visitor attractions and roads.
- 96 Private views across the wider study area are typically experienced by individual properties and settlements. In general, views from settlements are experienced from the settlement edge with views within the settlement often screened by intervening buildings and vegetation.

¹⁴ DCO Document Ref 6.7

- 97 Elsewhere views are typically enclosed by the layering effect of undulating landform, woodland blocks and strips of trees along stream/river valleys and hedgerows with mature trees, although there are some views to distant uplands, including to the Clwydian Range and Denbigh Moors. Localised ridges and valley slopes confine some views, particularly near Saron in the south, and the Elwy valley in the north. The Cefn Meiriadog ridge to the north would form a visual barrier between the northern end of the proposed overhead line and the landscape to the north, including St Asaph and the North Wales coastline.
- 98 The nearest nationally designated landscapes are:
- Snowdonia National Park (17km to west); and
 - Clwydian Range and Dee Valley AONB (7km to east).
- 99 Other designated and undesignated features include:
- High and outstanding LANDMAP Aspect Areas;
 - Y Berwy Area of Outstanding Beauty (AOB);
 - Special Landscape Areas;
 - Conservation Areas – Henllan, Bodelwyddan, Nantglyn and St Asaph;
 - Open Access Areas;
 - Clwydian Way Regional Trail and North Wales Pilgrim’s Way;
 - Registered Historic Landscapes – Denbigh Moors, Vale of Clwyd and Lower Elwy Valley;
 - Registered Parks and Gardens – Gwaenyog, Foxhall Newydd, Plas Heaton, Bodelwyddan Castle, Kinmel Park;
 - Scheduled Ancient Monuments – Mynydd y Gaer Hillfort, Denbigh Castle; and
 - Ancient semi-natural woodlands.

Assessment and Prediction of the Importance of Likely Residual Effects

Construction/ Decommissioning Effects

- 100 The longer term effects of removing trees, hedgerows and shrubs for construction are addressed as part of the assessment of operational effects.
- 101 Other construction effects would be of relatively short duration and would vary depending on the proximity to works, the amount of activity which would be visible and how long works would continue in a particular location.
- 102 The compound at Broadleys Farm would be in place for most of the construction programme, but at pole sites, construction activities would take place for a relatively short time. Works at height as the poles were installed are likely to be the most noticeable activities.

- 103 The significance of effects ranges from negligible where there would be no discernible change, to minor significance where construction operations would be seen in close proximity across a large proportion of the view. In the long term, however, these construction activities would not give rise to long term significant landscape or visual effects.

Operational Effects

Landscape

- 104 The Proposed Development would not have a significant effect on the designated landscapes of Snowdonia National Park or the Clwydian Range and Dee Valley AONB, or any other designated and undesignated features (which have a landscape aspect).
- 105 The residual effects of felling trees and woodlands and removing would be minor adverse, although a programme of 2:1 tree replacements would compensate for this in the long term.
- 106 The temporary effects on hedgerows would be minor adverse and therefore significant.
- 107 The effects on the landscape of the Denbigh and Derwen Hills, particularly the ridges to the north of Tir Mostyn and to the north of Peniel would be moderate adverse and therefore significant.
- 108 The effects on the parkland character of parts of the landscape of the Llanefydd Lowlands would be moderate adverse and therefore significant.
- 109 The effects on the landscape of the Afon Elwy Valley would be moderate adverse and therefore significant.
- 110 The effects on the landscape of the Cefn Meiriadog Ridge would be moderate adverse and therefore significant.
- 111 Although significant, these effects were assessed as moderate and none of these effects were assessed as major.

Visual

- 112 The greatest adverse visual effects arising from the presence of the Proposed Development would be moderate adverse (significant) and be experienced by receptors typically within 1km of the LoD.
- 113 The viewpoint assessment showed that moderate effects would be experienced by 15 out of 30 viewpoints. These are in the following locations:
- from Saron, the B5435, the Caer Mynydd caravan site, the network of public footpaths and the valley around Saron, as the alignment runs north across the valley adjacent to Saron and heads up over the ridge east of Foel Gasyth (Viewpoint 2);
 - from the northern slopes of the ridge east of Foel Gasyth and Peniel and close to the 132 KV Overhead Line (part of the Denbigh and Derwen Hills) at Viewpoint 50;

- from locations close to the 132 kV Overhead Line as it crossed the well-treed areas of landscape (where tree felling is required) and undulating landform near the Elwy Valley, including near the North Wales Pilgrim's Way Long Distance Trail (Viewpoints 27 and 32);
 - from locations close to the 132 kV Overhead Line to the north of the Lower Elwy Valley, on the slopes of the Lower Elwy Valley (Viewpoint 37) and where the 132 kV Overhead Line crossed the ridges on approach to the valley from the south (Viewpoint 34); and
 - from the network of public footpaths on the northern slopes of the Cefn Meiriadog, where a short section of the 132 kV Overhead Line would be seen on the skyline as it crossed the ridge.
- 114 Typically these were locations where the visual receptors are considered to be highly susceptible to changes in their view, and where the 132 kV Overhead Line would be:
- within 1km (within 2 - 3 fields);
 - present over a significant proportion of the foreground view;
 - visible over a large geographic extent of the view;
 - have limited intervening screening; and
 - be skylined in views.
- 115 Overall, the Proposed Development is likely to be more visible near Clocaenog, Tir Mostyn and Foel Gasyth.
- 116 Much of the Proposed Development would be largely unseen from the north of the study area, due to the intervening topography of the Cefn Meiriadog Ridge.

Residential Visual Amenity

- 117 Although some properties within approximately 200m of the Proposed Development would experience significant visual effects, none of these effects are considered to have a detrimental effect on living conditions.

Cumulative Effects

- 118 At the southern end of the Proposed Development, there may be moderate to major cumulative landscape and visual effects. The predicted effects would, however, be mainly due to the additional visual impacts of the consented wind farms and in particular the single wind turbines (Tyn y ffynnon, Meifod Farm and Hafod Ty Ddu) rather than the Proposed Development itself which would be viewed as a subsidiary structure.
- 119 In each case, the other developments are the greatest contributor to the significant adverse effect.

CHAPTER 8: HISTORIC ENVIRONMENT

- 120 Chapter 8¹⁵ of the ES describes the assessment of the likely significant effects on the historic environment resulting from the Proposed Development and includes a description of mitigation measures to avoid or reduce effects.
- 121 In addition to assessing the impacts on known heritage assets, including archaeological sites, features and finds, historic buildings and historic landscapes, the potential for impacts on buried and as yet unrecognised archaeological remains is also considered. The assessment also includes an evaluation of visual effects on the setting of heritage assets that may arise from the Proposed Development. This includes any potential combined and cumulative effects to the visual amenity which could arise where Proposed Development is seen in conjunction with the Wider Scheme and other existing, consented or proposed developments.

Baseline Environment

- 122 The Study Area encompasses a variety of prehistoric and later landscapes. Previous archaeological studies provide an understanding of the board narrative of the history of the landscape's development from the last glacial to the present.
- 123 The locations of cultural heritage assets are shown in Appendix 8.2¹⁶ of the ES. Within the 4km-wide Study Area there are 121 statutorily designated and 682 undesignated cultural heritage assets. Statutorily designated assets comprise:
- Scheduled (Ancient) Monuments (11);
 - Listed Buildings Grade I and II* (12);
 - Listed Buildings Grade II (90);
 - Registered Historic Landscapes (2);
 - Historic Parks and Gardens (5); and
 - Conservation Areas (1).
- 124 Immediately outside the 4km-wide Study Area there are a further 13 statutorily designated cultural heritage assets, which have also been considered in the assessment, comprising;
- Scheduled (Ancient) Monuments (2);
 - Listed Buildings Grade I and II* (1);
 - Listed Buildings Grade II (9); and
 - Registered Historic Landscapes (1).

¹⁵ DCO Document Ref 6.8

¹⁶ DCO Document Ref 6.21

- 125 The Proposed Development oversails 60 potentially 'historic' (i.e. pre-enclosure) field boundaries, as they meet the archaeological criteria of the Hedgerow Regulations. Of these potentially 'historic' boundaries, 40 include an 'Important Hedge'.
- 126 There is potential for below-ground archaeology, as yet undiscovered along the route of the Proposed Development.
- 127 Peat deposits of palaeo-environmental importance potentially exist within the upland moorland, within the floodplain of the River Elwy and potentially also within the Afon Ystrad, Afon Asa and Bryn Isaf Dingles

Assessment and Prediction of the Importance of Likely Residual Effects

Construction/ Decommissioning Effects

- 128 Ninety-four heritage assets lie wholly or partially within the Order Limits. For these, mitigation in the form of a watching brief or preservation in situ and demarcation would ensure that any direct effects on these assets would be reduced to neutral and therefore not significant.
- 129 The most likely indirect effect during the construction and decommissioning phases of the Proposed Development would be visual intrusion during the erection of poles and the stringing of cables. The effect is judged to be not Significant, on account of it being both short-term and temporary, and of negligible magnitude.

Operational Effects

- 130 Direct effects are not predicated during the operational phase. The most likely indirect effect during the operational phase of the Proposed Development would be visual intrusion from the equipment and its operation. Indirect visual intrusion is predicted for 68 assets, of which 64 are statutorily designated. These indirect effects are not permanent and would cease upon decommissioning.
- 131 Residual effects of the Proposed Development primarily relate to indirect visual effects upon heritage assets and/or their settings. Berain and its agricultural range (LB 163, 19855, 19856, 19857) would experience moderate/large, and therefore potentially Significant effects. The remaining indirect effects are assessed as being not Significant and mitigation is not proposed.

132 A summary of residual effects is presented below.

Significance of Effect	Direct Effects	Indirect Effects)
Moderate/Large (Significant)	0	4
Moderate	0	0
Slight/Moderate	0	15
Slight	0	48
Neutral/Slight	0	1
Neutral	94	0
Totals	94	68

Cumulative Effects

133 No significant cumulative effects are predicted to arise from the Stage 1 and Stage 2 developments. There may be some indirect cumulative visual effect on heritage assets in some locations (Mynydd Hiraethog (Denbigh Moors) and Lower Elwy Historic Landscapes, Twr yr Hill Round Barrow (SAM), Tir Mostyn stone settings, Kinmel Park, Bodelwyddan Castle and First World War Practice Trenches at Bodelwyddan) Park, but these would not be significant.

CHAPTER 9: FLOOD RISK AND WATER QUALITY

134 Chapter 9¹⁷ of the ES describes the assessment of the likely significant environmental effects of the Proposed Development on the water environment and includes a description of mitigation measures to avoid or reduce effects.

135 Three types of effects were assessed: the effects of flooding on the Proposed Development, flood risk to third parties caused by the Proposed Development and potential effects of the Proposed Development on water quality.

Baseline Environment

136 Average annual rainfall varies from approximately 1200mm around Clocaenog Forest to around 800mm close to St Asaph. These averages are moderately high.

137 The route of the Proposed Development crosses a number of watercourses which generally flow east or north-east towards the Vale of Clwyd and include the deep gorge of the Afon Elwy in the north of the study area which is joined by the Afon Ystrad north of Henllan.

138 The proposed 132 kV Overhead Line would have to cross the Afon Elwy floodplain at a point where it is 35m wide and the Afon Ystrad at a point where it is 35m wide and three other main rivers near Henllan where the floodplain is less than 10m wide.

¹⁷ DCO Document Ref 6.9

- 139 The baseline flood risk in the Study Area is defined in the Flood Consequence Assessment CA (DCO Document Ref 5.3).
- 140 The highest number of properties at significant risk of flooding are found in and around St Asaph, downstream of the Afon Elwy crossing point. There are a very small number of properties at significant risk of flooding between the Afon Ystrad crossing point and the confluence of the Ystrad with the Elwy, a distance of approximately 7.5km.
- 141 The watercourses within the study area are of generally good water quality.
- 142 There are no groundwater protection zones or drinking water safeguard zones and no public water abstraction points within the study area. There are, however, numerous private water supplies and agricultural water uses along the route of the Proposed Development.
- 143 There is a high productivity aquifer north-east of the Afon Elwy valley which is considered to be of high importance. Low productivity aquifers underlie the remaining route to the south though there are some superficial aquifers that may be locally used and are of medium importance.

Assessment and Prediction of the Importance of Likely Residual Effects

- 144 The highest flood risks to the Proposed Development occur during the construction works but the likelihood of a flood occurring during the 16 month construction period is lower than during the 40-year operational phase.
- 145 Once the works were completed there would be minimal flood risk because wood pole structures are resilient to prolonged periods of inundation.

Construction/Decommissioning Effects

- 146 There should be minimal increase in the impermeable area arising from the construction works as no hard surfacing would be required. The construction compound at Broadleys Farm would be surfaced in stone and is not likely to increase the potential rainfall runoff rate and the volume of water that would need to be drained.
- 147 Implementation of the embedded mitigation measures set out in the CEMP would mean that flood risk effects during construction would be negligible, both to the Proposed Development and to third parties potentially exposed to additional flood risk caused by the Proposed Development.
- 148 Effects on water quality would be minimised by adoption of embedded mitigation measures set out in the CEMP. The effects are predicted to be of negligible significance.

Operational Effects

- 149 Flood risk effects during operation would be negligible both to the Proposed Development and to third parties caused by the Proposed Development. The one pole sited within the floodplain of the Afon Elwy and could give rise to a small potential increase in flood risk downstream if an extreme flood event caused it to be swept away. This risk would be confined to an area upstream of a weir and the Bont-newydd road bridge and no properties would be at risk in either location. The flood risk effects are predicted to be negligible.

- 150 It is unlikely that there would be any effect on water quality as only occasional access would be required to the Proposed Development. This would not generate significant erosion or pose a pollution hazard. No treatment of the poles or equipment is envisaged, so there would be no use of chemicals or potentially polluting substances along the route during the operational phase. Effects on water quality during any maintenance operations would continue to be minimised by adoption of embedded mitigation measures set out in the CEMP. The effects on water quality are predicted to be of negligible significance.

Cumulative Effects

- 151 The cumulative assessment is provided in Chapter 9. None of the predicted cumulative effects is greater than the predicted effects identified described above.

CHAPTER 10: LAND USE AND AGRICULTURE

- 152 Chapter 10¹⁸ of the ES describes the assessment of the likely significant environmental effects of the Proposed Development on land use and agriculture and includes a description of mitigation measures to avoid or reduce effects.
- 153 The assessment considered the following topics in the assessment of likely significant land use effects:
- land take and temporary or permanent effects upon land holdings in terms of agricultural practices;
 - effects on agri-environment schemes;
 - effects on geology and ground conditions; and
 - effects caused by preventing or delaying planning permissions or allocations in plans (including mineral safeguarding areas) being developed in part or in their entirety (for example, through limiting the potential for development).

Baseline Environment

Land Use and Agriculture

- 154 Land use in the study area is mainly agricultural dominated by a mix of pasture for grazing and arable land. The Clocaenog Forest, a large coniferous plantation lies at the southern extent of the Order Limits. The agricultural land is of Grade 3 land quality with some Grade 4.
- 155 A number of landowners participate in the Glastir agri-environmental scheme.

¹⁸ DCO Document Ref 6.10

Geology and Ground Conditions

Bedrock

- 156 Much of the area defined by the Order Limits is underlain by Silurian mudstones, siltstones and sandstones but these give way in the north to more recent Carboniferous limestone. All the rocks are heavily faulted. Bedrock is present at the surface in some locations.

Superficial Deposits

- 157 Superficial deposits underlying the Order Limits predominately comprise glacial till and alluvial (river) deposits.

Designated Sites

- 158 The Coedydd ac Ogofâu Elwy a Meirchion SSSI is located 5 km north-west of Denbigh, north of the village of Henllan. The site is of interest, partly for the geological and palaeontological interest of Galltfaenan, Cefn and Pontnewydd Caves.
- 159 Four Geological Conservation Review (GCR) sites lie within this SSSI and are important for the ice-age sediments and vertebrate mammalian fossils found within the caves. Pontnewydd Cave is internationally valued for its extensive Pleistocene record which includes evidence of the oldest-known human remains in Wales.

Hydrogeology

- 160 Most of the Order Limits are underlain by a low productivity aquifer associated with the Elwy Formation bedrock. There is a change in hydrogeology which coincides with the change in bedrock formation at the northern end of the route and from Pole 193, the Order Limits is underlain by a moderately productive aquifer.

Ground Conditions

- 161 Prior to construction a geotechnical engineer would undertake a site walkover to assess the potential risk of slope stability and other ground related hazards.
- 162 Ground conditions are generally suitable for the installation of the Proposed Development, although some localised areas of weak/loose ground and shallow or near-surface bedrock area mean that special foundation designs or installation techniques may be required.

Mineral Allocations

- 163 Land within the Order Limits falls within areas identified as being safeguarded in both Denbighshire and Conwy.

Assessment and Prediction of the Importance of Likely Residual Effects

Construction Effects

Land Use and Agriculture

- 164 No Grades 1 or 2 agricultural land (i.e. 'best and most versatile') land would be affected by the Proposed Development.

- 165 Implementation of the measures included in the CEMP including biosecurity measures would limit the likely effects of the Proposed Development and overall, the impact on land use and agriculture is predicted to be of negligible to minor adverse significance. Landowners, including Broadleys Farm where the construction compound would be sited, would be compensated for the land being taken out of production temporarily so there would be negligible economic effects on agriculture.

Geology and Ground Conditions

- 166 The Limits of Deviation avoid the Coedydd ac Ogofâu Elwy a Meirchion SSSI therefore no effects would arise.
- 167 The effects on soils would be minimised through implementation of the measures included in the CEMP and overall are predicted to be of minor adverse significance.

Operational Effects

Agriculture

- 168 Once operational, the amount of land removed from its current use would be less than the land required for construction. Direct land take would be limited to the footprint of the newly erected pole structures and restrictions would be placed on what could be grown beneath the 132 Kv Overhead Line and what machinery could be used. This may cause inconvenience to agricultural operations, especially during cultivations, spraying, harvesting and grass cutting. The landowner would be compensated by SP Manweb for any effects on the economic viability of agricultural operations so there would be negligible economic effects on agriculture.

Geology and Ground Conditions

- 169 Due to the distance to the geological elements of the SSSI identified above (Coedydd ac Ogofâu Elwy a Meirchion), there would be no significant effects on these sites which are designated for their geological interest. Elsewhere the nature of the Proposed Development is such that there would be no effects upon geology or ground conditions during operation.

Planning Allocations

- 170 The route passes through areas safeguarded for minerals, including limestone, sand and gravel. These areas are unavoidable in most instances. However, even if plans to exploit the mineral resource are brought forward then typically the extraction can accommodate existing overhead lines. The magnitude of effect on mineral resources is related to the footprint (land area) required for the Proposed Development. This would be very small comprising the support pole locations only. The proportion of the resource directly affected would therefore be extremely low. An indirect effect may be caused by the conductors which could pose a constraint upon extraction activities. As a proportion of the overall resource, this is considered to be a small scale effect.
- 171 The effect upon safeguarded areas is of minor significance and could be adequately mitigated.

Cumulative Effects

- 172 The cumulative assessment is provided in Chapter 10. None of the predicted cumulative effects is greater than the predicted effects identified described above.

CHAPTER 11: SOCIO-ECONOMIC

- 173 Chapter 11¹⁹ of the ES describes the assessment of the likely significant socio-economic and tourism effects of the Proposed Development. In particular, it considers the potential adverse effects upon the local tourism economy, business interests and tourism interests, and the potential beneficial effects on the local economy in terms of income and job creation and increased custom for local businesses.

Baseline Environment

- 174 The population of Denbighshire and Conwy is increasing and getting older. By 2021 over a quarter of both Denbighshire and Conwy's populations are expected to be of retirement age. Both have higher than average proportions of people working in health and social work. There is relatively high proportion of skilled manual labour and average levels of people working in construction. The overall socio-economic study area is assessed as being of low sensitivity, i.e. the Proposed Development is unlikely to lead to labour market pressure and distortions (i.e. wage inflation, skills and capacity shortages, importation of labour).
- 175 The larger settlements in the wider study area are St Asaph, Denbigh and Bodelwyddan. Villages and hamlets are dispersed throughout the study area and include the large village of Henllan.
- 176 There is a fairly low tourism business density in the 4km study area compared to other parts of North Wales. Attractions are defined as being of local status and generate low visitor numbers. There are five tourist attractions close to the Proposed Development: Bodelwyddan Castle and Park, St Asaph Cathedral and Llyn Brenig Visitor Centre, Denbigh Castle and the Wireless in Wales Museum. The Study Area also has approximately 70 tourism related businesses. The majority of these businesses are bars and restaurants and tend to be located towards the northern end of the Order Limits. The Clwydian Range and Dee Valley Area of Outstanding Natural Beauty (AONB) lies approximately 6km to the east of the Proposed Development and provides a focus of tourism and recreation activities in the area.
- 177 There is an extensive network of local public rights of way as well as the Clwydian Way and the North Pilgrim's Way both of which are regionally promoted long distance trails. The local tourism-related businesses survey established that walking/ sightseeing was the primary activity of visitors and tourists to the area.

¹⁹ DCO Document Ref 6.11

Assessment and Prediction of the Importance of Likely Effects

Construction Effects

Socio-Economics

- 178 Construction of the Proposed Development will require a small number (circa 25 over a 15 month period) of suitably skilled and experienced temporary construction workers. Elements of the construction phase may require input from the local workforce however this is likely to be a negligible requirement and would not constitute a significant impact for the local workforce. Local accommodation providers may however benefit during the construction phase. The Proposed Development would have a negligible/minor positive impact on employment during the construction phase.

Tourism Economy

- 179 The assessment established that there could be construction impacts on one business which lies close to the Proposed Development, but overall the impacts on the local tourism economy are predicted to be negligible/low adverse.

Operational Effects

Socio-economic

- 180 Wood pole overhead lines typically require little maintenance and this would be undertaken by existing SP Manweb staff or by staff from specialised firms and would not translate into permanent long term jobs for the local area. The Proposed Development would have a negligible effect on employment during operation.

Tourism

- 181 A tourism business survey was undertaken to provide a specific quantification of potential impact within the local economy on tourism-related businesses potentially affected by the Proposed Development. Businesses included in the survey are accommodation providers and tourist attractions. This study was used to provide an informed view of the business community across the Study Area and can be used as a proxy for tourists, visitors, and users of the facilities and other visitor resources within the Study Area across the whole season.
- 182 The tourism related business survey results and comparator research evidence base indicates that the presence of the proposed overhead line would have negligible/low adverse impact on local business performance or wider North Wales' tourism. Most respondents acknowledged that wood pole overhead lines are a commonplace feature in the countryside, although some concerns were raised about the potential visual impact on the area and whether this would deter visitors and tourists from coming back.
- 183 One business located within the immediate proximity of the Proposed Development may however experience a significant effect due to proximity and potential visual impacts (as confirmed by the Proposed Developments ZTV within Chapter 7).

Cumulative Effects

184 A detailed socio-economic and tourism cumulative assessment has not been prepared for the Proposed Development. Combining the Proposed Development with the other major developments in the area, which would potentially have much greater effects, would be misleading with respect to this project.

Socio-economics

185 Preparing a cumulative labour market assessment is not considered to be relevant for this project. The Proposed Development requires a small level of specialist labour. Combining the Proposed Development with other nearby construction projects would not provide meaningful results.

Tourism

186 Visual impact is the most commonly cited factor by business survey respondents. Chapter 7 'Landscape and Visual' states 'the contribution of the North Wales Wind Farm Connections Project to the total cumulative landscape and visual effects are not significant.' The Proposed Developments overall tourism impact (based on the findings of the landscape and visual assessment) are considered to be not significant.

CHAPTER 12: TRAFFIC

187 Chapter 12²⁰ of the ES describes the assessment of the likely significant environmental effects of the Proposed Development on traffic and transport, and includes a description of mitigation measures to avoid or reduce effects.

Baseline Environment

188 The Proposed Development, as it runs broadly south to north, would cross the A543 which connects the A5 to Denbigh, as well as some B-class and minor roads. Apart from the A543, most of these are of only local importance. A number of the A roads, and some of the minor roads, would form part of the route taken by construction traffic. Automatic Traffic Counters (ATCs) were used to assess the baseline traffic flows along these roads.

Assessment and Prediction of the Importance of Likely Residual Effects

Construction/ Decommissioning Effects

189 There would be a small increase in traffic flows on local roads close to the Proposed Development. These would be associated with the installation of accesses (including temporary stoning of access tracks) and the site construction compound at Broadleys Farm, pole foundation excavation, pole and conductor installation, site construction compound reinstatement, access reinstatement and construction employee vehicle movements.

²⁰ DCO Document Ref 6.12

- 190 The poles would be delivered to the construction compound at Broadleys Farm and the temporary storage areas at Clocaenog and St Asaph by HGV. From here they would be taken to the pole laydown areas or pole erection sites. The conductor would be delivered on cable drums by general purpose vehicles.
- 191 Guidance in TAN 1821 has been used along with the Department for Transport's "Guidance on Transport Assessment" (GTA). These documents set out thresholds and criteria for assessing new development.
- 192 The assessment has identified no locations where the increase in traffic flows are close to the thresholds and guidance criteria. Effects are therefore predicted to be negligible.
- 193 Implementation of the management measures and working practices set out in the CEMP would minimise the effects of construction traffic and the effects are predicted to be short term and of negligible to minor adverse significance.

Operational Effects

- 194 Once operational, the Proposed Development would generate very few vehicle movements and operational effects are predicted to be negligible.

Cumulative Effects

- 195 The cumulative assessment is provided in Chapter 12. None of the predicted cumulative effects is greater than the predicted effects identified described above.

CHAPTER 13: EMISSIONS

Introduction

- 196 Chapter 13²² of the ES describes the assessment of the likely significant effects of the Proposed Development arising from emissions (noise and vibration, air quality and waste) and includes a description of mitigation measures to avoid or reduce effects.
- 197 The Scoping Opinion confirmed that potential effects arising from noise and vibration, waste and effects on air quality during operation of the Proposed Development could be removed from the scope of the assessment.

Baseline Environment

- 198 The Proposed Development is located in a rural area, with existing noise levels mainly influenced by proximity to roads. Daytime noise levels would be low along most of the route. The area in which the Proposed Development is located is rural. Levels of nitrogen oxide and sulphur dioxide and other air pollutants associated with industrial and vehicle pollution are low.

²¹ Planning Policy Wales, Technical Advice Note 18, Transport (March 2007))

²² DCO Document Ref 6.13

Assessment and Prediction of the Importance of Likely Residual Effects

Construction/ Decommissioning Effects

Noise and Vibration

- 199 The main sources of noise would be the movement of construction vehicles through adjacent residential areas to the construction working areas and along the route of the Proposed Development, areas of tree-felling, and the use of plant involved in the installation of the poles.
- 200 Five properties were identified where noise levels are predicted to be sufficiently high to require the implementation of specific mitigation measures to ensure that any effects would not be significant. Elsewhere implementation of the construction methods identified within the CEMP would ensure that no significant adverse construction or decommissioning effects would arise from the Proposed Development.
- 201 No significant effects were identified for vibration.

Air Quality

- 202 Potential environmental effects are predominantly associated with the generation and dispersal of dust and airborne particulate matter, as well as emissions from construction traffic.
- 203 Implementation of the construction methods provided within the CEMP would ensure that no significant adverse construction or decommissioning effects would arise from the Proposed Development. The significance of effect may be slightly higher at the Broadleys Farm construction compound, however the effects are still predicted to be below the significance threshold.

Waste

- 204 The main contractor would be required to develop a Site Waste Management Plan, which will set the framework for the management of wastes generated during the construction process. The aim would be to minimise the volume of waste generated and maximise resource efficiency by applying the waste hierarchy (reduce – reuse – recycle - responsible disposal).
- 205 This approach and implementation of the construction methods provided within the CEMP and Site Waste Management Plan would ensure that no significant adverse construction or decommissioning effects would arise from the Proposed Development.

Cumulative Effects

- 206 Due to the linear nature of the works associated with the Proposed Development and the underground cable, and the relatively rapid rate of progress past any sensitive receptor, any noise exposure would be limited to a brief period of time unlikely to exceed a few days in the total construction contract, and there would be little risk of this coinciding with noise from other development works, therefore no cumulative effects are anticipated.

CHAPTER 14: ELECTRIC AND MAGNETIC FIELDS

- 207 Chapter 14²³ of the ES describes the likely significant environmental effects of the Proposed Development with respect to electric and magnetic fields (EMFs), and includes a description of mitigation measures to avoid or reduce effects.
- 208 EMFs are produced both naturally and as a result of human activity. The earth has both a magnetic field (produced by currents deep inside the molten core of the planet) and an electric field (produced by electrical activity in the atmosphere, such as thunderstorms).
- 209 Electric fields are produced by voltage. Voltage is the pressure behind the flow of electricity. It can be likened to the pressure of water in a hose. Electricity in UK homes is at a voltage of 230 volts (V), but outside homes it is distributed at higher voltages, from 11,000 volts (usually written 11kV) up to 400,000 volts (400kV). Generally, the higher the voltage, the higher the electric field. Electric fields are measured in volts per metre (V/m).
- 210 Magnetic fields are produced by current, which is the flow of electricity. Current, which is measured in amperes or amps, can be likened to the flow of water in a hose when the nozzle is open. Generally, the higher the current, the higher the magnetic field. Magnetic fields are measured in microteslas (μT).
- 211 The balance of scientific evidence over several decades of research has not proven a causal link between EMFs and cancer or any other disease. Public Health England provides advice to the UK Government on standards of protection for exposure to non-ionizing radiation, including EMFs arising from overhead lines. Public Health England keeps under review emerging scientific research and/or studies that may link EMF exposure with various health problems and provides advice to the Department of Health on the possible need for introducing further precautionary measures.
- 212 The Department of Health does not consider that overhead line EMFs constitute a significant hazard to the operation of pacemakers. There is little evidence that exposure of crops, farm animals or natural ecosystems to overhead line EMFs has any agriculturally significant consequences.
- 213 The UK Government have specifically rejected the introduction of 'corridors' around overhead lines on EMF grounds and consider this option to be disproportionate in the light of the evidence base on the potential health risks.

Assessment and Prediction of the Importance of Likely Effects

- 214 140 Potential effects arising from EMFs during construction of the Proposed Development were removed from the scope of the assessment during the EIA scoping.

²³ DCO Document Ref 6.14

Operational Effects

- 215 The proposed development is located within a rural area which accommodates existing electrical assets that generate EMFs and also has a background level of naturally occurring EMFs.
- 216 The design of the Proposed Development complies with Government exposure limits, but because of concerns raised by both the public and government agencies, SP Manweb assessed the predicted EMF levels to provide evidence that this would be the case.
- 217 The assessment confirmed that the maximum EMFs produced by the proposed 132 kV Overhead Line would be less than the relevant Government exposure limits.
- 218 There is no minimum lateral distance from the 132 kV Overhead Line required in order to achieve compliance. As such compliance is not dependent on the exact route of the Proposed Development, which means that if the 132 kV Overhead Line were to move within the Limits of Deviation, no increases in the levels would occur and the effect would remain not significant.
- 219 No mitigation is required as the proposed development complies with the current public exposure guidelines as detailed in NPS EN-5. If these requirements are met NPS (EN-5) states that 'no further mitigation should be necessary'.

Cumulative Effects

- 220 SP Manweb ensures that all electrical assets comply with the UK Government exposure limits and policies. As all of the proposed developments considered within the cumulative assessment would comply with these exposure limits, the cumulative impacts are predicted to be not significant.

CHAPTER 15: SUMMARY OF ENVIRONMENTAL EFFECTS

- 221 Chapter 15²⁴ of the ES provides a summary of the likely environmental effects of the Proposed Development, including any likely combined effects, and a summary of the cumulative effects.

²⁴ DCO Document Ref 6.15