7 ECOLOGY

7.1 Introduction

7.1.1 This Chapter appraises the likely effects of the Proposed Project in respect of terrestrial ecology. It considers the effects on ecological features during the construction, operational and decommissioning stages. The appraisal of likely effects on marine ecology is presented in Chapter 16.

7.1.2 The Chapter also identifies proposed mitigation measures to prevent, minimise or control likely negative (i.e. adverse) effects on the ecology of the site and surrounding area arising from the Proposed Project.

7.1.3 This Chapter should be read together with the introductory chapters of this Environmental Appraisal (Chapters 1 – 5). This ecological appraisal has been informed by data from other technical chapters including Chapter 6 (Landscape and Visual), Chapter 9 (Water Resources and Flood Risk), Chapter 11 (Agriculture and Land Use), Chapter 14 (Noise and Vibration) and Chapter 16 (Marine Ecology).

7.1.4 This chapter is supported by the following Appendices:

- Appendix 2A – Outline Construction Environmental Management Plan (CEMP) and supporting appendices (including Outline Peat Management Plan and Outline Habitat Management Plan);
- Appendix 7A - Ecological Baseline Report (Botanical) RSK, 2019;
- Appendix 7B - Ecological Baseline Report (Animal) RSK, 2019; and
- Appendix 7C - Meirionnydd Oakwoods and Bat Sites Special Area of Conservation – Habitats Regulation Assessment Report RSK, 2019.

7.2 Scope and Methodology

Study Area

7.2.1 The appraisal of ecological baseline information contained within this Chapter is based around several different geographic extents.

7.2.2 Desk study data was requested within 2 km of the Area of Search for Permanent and Temporary Works (described in Chapter 3 and shown on Figure 1.1). This area is known as the Desk Study Area.

7.2.3 Ecological surveys were carried out within the Ecological Survey Area (Appendix 7A – Figure 1). This focused on all areas where there is potential for adverse effects to occur.

7.2.4 Ecological surveys were not carried out for the proposed overhead line (OHL) works between Pylon 4ZC026 and Pylon 4ZC025, at the far eastern end of the site. Works in these areas are not due to take place for a number of years and will involve temporary, short -term light vehicle access only. A walkover of this area will be required prior to the works being carried out to identify any ecological constraints.

7.2.5 The appraisal of ecological affects from the project has been based on the Site Boundary (Figure 7.1), with effects on the surrounding area considered where appropriate (e.g. lighting and noise impacts beyond the Site Boundary).

Appraisal Methodology

7.2.6 This appraisal involves the following key stages:

- identifying potential effects that could arise from the whole lifespan of the project;

- a background data search to obtain archival records of sites and species, and to gain information to focus the field surveys;
- identifying ecological features (e.g. habitats, species, ecosystems and their functions/processes, previously known as ecological receptors) through field surveys and the background data search;
- considering the ecological value of the ecological features leading to identification of important ecological features;
- identifying potential impacts and assessment of effects on the integrity or conservation status of the ecological features;
- identifying cumulative impacts; and
- incorporating ecological mitigation measures to avoid or reduce effects, and compensation measures to balance any unavoidable effects, and enhancement to provide net benefits for biodiversity over and above requirements for avoidance, mitigation and compensation.

Desk Study

7.2.7 A desk study was carried out to identify designated sites and records of protected and notable species potentially relevant to the Proposed Project.

7.2.8 A search distance of 2km from the Area of Search for Permanent and Temporary Works boundary was used (hereafter referred to as the Desk Study Area). Only records from within the last 10 years are regarded as reliable and therefore included within this appraisal.

7.2.9 The desk study was carried out using data from the following sources:

- Cofnod (North Wales Environmental Information Service) received on 17th November 2015 and updated in July 2018; and
- Multi-Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk).

7.2.10 The MAGIC website was consulted to determine whether any statutory designated sites are present within or near the Area of Search for Permanent and Temporary Works. This website includes information on: European designations, Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and the internationally designated Wetland of International Importance, i.e. Ramsar sites, nationally designated Sites of Special Scientific Interest (SSSIs), and Ancient Woodland.

7.2.11 In addition, available online aerial photography was examined to understand the wider habitat context. The habitat connections between the designated sites and other areas were also assessed from aerial photography, in conjunction with available maps and site designations. In addition to physical connections such as linear woodland, hedges and watercourses, an appraisal was made of the potential of habitat within the Ecological Survey Area to support local populations of protected and notable species occurring in the surrounding area. Particular attention was given to protected and notable habitats and species included under Schedules 1, 5, 8 and 9 of the Wildlife and Countryside Act 1981 (as amended); Schedules 2 and 4 of The Conservation of Habitat & Species Regulations 2017 (as amended); and Species and Habitats of Principal Importance in Wales, listed under section 7 of the Environment Act 2016.

7.2.12 The proposals will result in the removal of pylons and conductors/cables rather than their construction, a 2km search area for bat records and roosts was considered appropriate. The exception is the removal (and then erection in an adjacent location) of Pylon

4ZCO27. Bat records within 2 km are thought appropriate for the moving of this pylon as it is unlikely to result in additional effects on bats in the local area.

Extended Phase 1 Habitat Survey

7.2.13 A Preliminary Ecological Appraisal survey was undertaken following the Extended Phase 1 Habitat Survey methodology (JNCC, 2010) as extended for Ecological Impact Assessment in Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment, 1995). This involved a survey undertaken on the 26th and 27th October and 23rd November 2015. The survey was updated in August 2018 and October 2019, recording and mapping habitat types and other ecological features. The results of these surveys are shown in Appendix 7A. The Extended Phase 1 Habitats Survey was undertaken by AECOM ecologists and the update survey was carried out by RSK Environment ecologists. Habitats within the boundary were classified according to the standard Phase 1 Habitat Survey methodology (JNCC 2010).

7.2.14 The Extended Phase 1 Habitat Survey was carried out on all parts of the Ecological Survey Area. The habitats on site were surveyed on foot and it was possible to survey all areas.

7.2.15 Botanical nomenclature used in this appraisal and Appendix 7A follows Stace (2010).

7.2.16 Where ecological features of particular note were present, target notes were marked on a field map and a description of each taken. Plant species were identified for different habitat types. However, these are indicative of habitat, rather than detailed inventories of the species present.

7.2.17 An appraisal was made of the potential suitability of the habitats to support protected or notable species of plants and/or animals. Field signs, features with potential to support protected species and evidence of their presence were recorded when encountered, but no detailed surveys were carried out for species at that stage as this does not form part of an Extended Phase 1 Habitat Survey. Results from subsequent detailed protected species surveys are presented in Appendix 7B.

7.2.18 If found, a note was made of visible instances of invasive non-native plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Assigning Ecological Value/Importance

7.2.19 The value or importance of an ecological resource or feature should be defined in terms of a geographic scale (see Table 7.1 below). Therefore, the value (or potential value) of ecological receptors on, and in the immediate vicinity of, the Ecological Survey Area has been considered at the following scales:

- International;
- National (i.e. Wales);
- Regional (i.e. North West of Wales);
- County (i.e. Gwynedd);
- District (Snowdonia); and
- Local (the Site plus a 1km radius).

7.2.20 Where the value is considered less than this it is considered ‘negligible’.

Table 7.1: Resource/Receptor Evaluation

Value/Sensitivity of Resource/Receptor	Example Criteria
Very High (International)	An internationally designated site or candidate/proposed site (Special Protection Area (SPA), potential SPA, Special Area of Conservation (SAC), candidate SAC and/or Ramsar site). A sustainable area of a habitat listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of the larger whole. Sustainable population of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) i.e.: - IUCN Red List species that is listed as critically endangered, endangered or vulnerable; or - Species listed in Annex IV of the Habitats Directive; or - Sites that support 1% or more of a biogeographic population of a species.
High (National)	A nationally designated site (Site of Special Scientific Interest (SSSI), National Nature Reserve) or a discrete area which meets the selection criteria for national designation (e.g. SSSI selection criteria). An area formally selected by Defra as a Nature Improvement Area. A sustainable area of a priority habitat identified in the UK BAP or of smaller areas of such habitat, which are essential to maintain the viability of the whole. Sustainable population of a nationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) i.e.: - Species listed on Schedules 5 and 8 of the WCA (1981); - UK Red Data Book species; - Other species listed as occurring in 15 or fewer 10 km squares in the UK; or - Sites supporting 1% or more of a national population.
Medium – High (Regional)	Sites/populations which exceed the County-level designations but fall short of SSSI selection guidelines, including the following: - Sustainable areas of key habitat identified in the Regional BAP or smaller areas of such habitat, which are essential to maintain the viability of the whole; - Population of a species listed as being nationally scarce which occurs in 16-100 10 km squares in the UK; - Population of a species listed in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation; or

Value/Sensitivity of Resource/Receptor	Example Criteria
	- Sites supporting 1% or more of a regional population.
Medium (County)	Some designated sites (including Sites of Importance for Nature Conservation, County Wildlife Sites, Sites of Metropolitan Importance). A viable area of habitat identified in the County BAP. Sustainable populations of the following species: - Species listed in a County/Metropolitan 'red data book' or BAP on account of its rarity/localisation in a county context; or, - Sites supporting 1% or more of a county population.
Local	- Very low importance and rarity, local scale: - Areas of habitat considered to appreciably enrich the habitat resource within the ecological study area itself. - A small population of a species of conservation concern i.e. listed in the Local BAP.

Nature of Impacts

7.2.21 Once the ecological receptors (designated site, habitat, assemblage or species) have been identified and their value defined, a judgment is made as to whether the Proposed Project is likely to result in impacts upon each of the identified receptors and, if appropriate, the nature of those impacts.

Interactive Effects

7.2.22 This Environmental Appraisal considers the interaction of effects with other disciplines, such as surface water, archaeology and cultural heritage, landscape, air quality and noise.

7.3 Consultation Undertaken

7.3.1 In addition to formal consultation, there has been ongoing consultation with ecologists from Snowdonia National Park Authority and Gwynedd Council including attendance at a number of Stakeholder Reference Group (SRG) meetings throughout the development of the Proposed Project. The purpose of these meetings has been to update stakeholders on the status and progress of the design and assessment work conducted, and to provide the opportunity for stakeholders to provide comments and input to various aspects.

7.3.1 A Screening and Scoping Report (National Grid, October 2018) was prepared and submitted to Gwynedd Council, Snowdonia National Park Authority and Natural Resources Wales. The information and advice received during the screening and scoping process with regard to ecology is summarised in Appendix 3B.

7.3.2 A summary of the responses received following submission of the screening and scoping report is provided in Table 7.2 below.

Table 7.2: Consultation Responses

Date	Consultee Response Summary	National Grid Response
15/02/2019	Gwynedd Council Planning Manager (Cara Owen) - Part of the development is located in or near the Meirionydd Oakwoods and Bat Sites SAC and Glaslyn and Ysbyty Bron y Garth SSSI. It is considered that the effects can be suitably mitigated, and NRW have confirmed that in terms of development within the estuary, that the effect is not likely to be significant and that EIA is not required. Specific information is required to enable Gwynedd Council as competent authority to undertake a test of likely significant effects to assess the potential impact of the development proposals.	Effects on designated sites are assessed in this chapter. The HRA is provided in Appendix 7C.
10/12/2018 & 18/01/2019	Natural Resources Wales (NRW, to Gwynedd Council) Development Planning Advisor (Delyth Rowlands) & NRW Permitting Officer Marine Licencing Team (Peter Morrison) - We note that the Applicant has identified a number of statutory protected sites within or on the boundary of their proposed area of search for permanent and temporary works. Impacts to these sites will need to be carefully considered. We recommend that the proposed Environmental Assessment Report should contain a section that includes a statement to inform the Habitats Regulations Assessment (HRA).	Effects on designated sites are assessed in this chapter. The HRA is provided in Appendix 7C.
15/02/2019 & 10/12/2018 & 18/01/2019	Gwynedd Council Planning Manager (Cara Owen) & Natural Resources Wales (NRW, to Gwynedd Council) Development Planning Advisor (Delyth Rowlands) & Permitting Officer Marine Licencing Team (Peter Morrison) - The applicant intends to split the ecology assessment into two separate chapters in the proposed Environmental Assessment Report; these being 'ecology' and 'marine ecology'.	Noted. The divide between the terrestrial and marine environments is the Mean High Water Mark to align with the Town and Country Planning and Marine Licencing regimes.
15/02/2019	Gwynedd Council Planning Manager (Cara Owen) - We recommend that the proposed Environmental Assessment Report should contain a section/appendix that includes a statement to inform the Habitats Regulations Assessment (HRA). The LPA will be the competent Authority for works that take place outside of the scope of the Marine Area.	Effects on designated sites are assessed in this chapter. The HRA is provided in Appendix 7C.
15/02/2019	Gwynedd Council Planning Manager (Cara Owen) - Gwynedd Council Biodiversity Unit concur with the scope of the surveys already carried out, and those that are proposed to be carried out; and also the commitment to undertake a Construction	Noted.

Date	Consultee Response Summary	National Grid Response
	Management Plan which will be prepared and implemented to ensure that methods of best practice are followed. You are advised to contact the officers directly for further discussion (Rhys Jones Gwynedd Council Biodiversity Team Leader; Dafydd Roberts Snowdonia National Park Ecologist)	
11/11/2018	Senior Biodiversity Officer Gwynedd Council (Emily Meilleur) - The area through which the proposed works are to take place includes several international and national sites of importance for nature and biodiversity. This development proposal will require a Habitat Regulations Assessment. The land and sea proposed for development support many ecological features such as otters, reptiles, lesser horseshoe bats, several birds and moths listed under section 7 of the Environment Act 2016. Surveys and assessment should be undertaken to cover all relevant taxa.	Noted - Ecological impacts and designated sites are assessed in this chapter. The HRA is provided in Appendix 7C.
19/12/2018	Snowdonia National Park Authority Head of Development Management and Compliance (Aled Lloyd) - The applicant will need to demonstrate how they intend to comply with the Welsh Government's Technical Advice Note 5, the British Standards Institute BS42020: 2013 'Biodiversity: Code of Practice for planning and development', and the Eryri Local Development Plan documents. This will need to be documented within the Environmental Report. The applicant will need to demonstrate how the 'mitigation hierarchy' is being applied to the Project with regard to biodiversity.	Noted. Application of the mitigation hierarchy in respects to biodiversity has been discussed in this chapter.
10/12/2018 & 18/01/2019	Natural Resources Wales (NRW, to Gwynedd Council) Development Planning Advisor (Delyth Rowlands) & NRW Permitting Officer Marine Licencing Team (Peter Morrison) - We are satisfied that protected species have generally been adequately covered by the ecology section of the Screening and Scoping Report.	Noted.
10/12/2018 & 18/01/2019	Natural Resources Wales (NRW, to Gwynedd Council) Development Planning Advisor (Delyth Rowlands) & NRW Permitting Officer Marine Licencing Team (Peter Morrison) - We welcome the commitment to undertake a Construction Environmental Management Plan (CEMP) which will be prepared and implemented to ensure that methods of best practice are followed. We recommend that the CEMP includes a biosecurity risk assessment to minimise the risk of the introduction of invasive non-native species occurring as a result of the works.	Noted. A biodiversity risk assessment has been provided as an appendix to the CEMP (see Appendix 2A).

Date	Consultee Response Summary	National Grid Response
10/01/20	Response from National Trust to the consultation draft of the planning application.	The Ecological Chapter has been updated accordingly.
07/01/20	Response from Gwynedd Council to the consultation draft of the planning application. Refers to biodiversity and ecological Issues and JLDP Policies PS19, AMG 5, AMG 6, TAN 5: Development and Nature Conservation	The Ecological Chapter has been updated accordingly.
07/01/20	Response from Gwynedd Council Biodiversity Officer to the consultation draft of the planning application. Requirement for biodiversity enhancement and suggestion of the use of swift boxes for biodiversity gain.	The Ecological Chapter has been updated accordingly.

7.3.3 The scope and scale of ecological surveys for the project, specifically in relation to bat activity surveys, wintering bird surveys and Great Crested Newts, were agreed by Rhys Jones, Senior Biodiversity Officer, at Gwynedd Council.

7.3.4 The initial SSSI assent applications for ground investigations at Glaslyn SSSI were agreed in consultation with Joanna Clark, Senior Conservation Officer at Natural Resources Wales.

7.3.5 A site meeting was held in September 2019 with Dafydd Roberts of Snowdonia National Park Authority to discuss construction and mitigation in valley mire habitat at the eastern end of the Site Boundary.

7.4 Relevant Legislation and Policy

Legislative Framework

7.4.1 A number of Acts, Directives and international conventions aim to conserve biodiversity and nature conservation interest in the UK. A list relevant to the Proposed Project comprises:

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1979);
- the EC Wild Birds Directive 1979 (European Directive 79/409/EEC on the conservation of wild birds);
- the Wildlife and Countryside Act 1981 (as amended);
- the Countryside and Rights of Way Act 2000;
- the Hedgerows Regulations 1997;
- the Environment Act 2016; and
- the Protection of Badgers Act 1992.

Planning Policy

7.4.2 Relevant planning policy at the national and local level includes:

- National Planning Policy Framework (NPPF);

- Policy ENV3 – Open Spaces and Trees;
- Policy ENV7 – The Protection of the Natural Environment - Designated Sites;
- Policy ENV8 – Other Landscape Elements of Importance for Nature Conservation;
- Policy GEN7 – Nature Conservation;

- the Planning Policy Wales (PPW) (2016);
- the Gwynedd Unitary Development Plan 2001-2016; and
- the Eryri Local Development Plan 2007-2022 (adopted by Snowdonia National Park Authority in July 2011).

7.4.3 Further detail is provided in Chapter 5 (Planning Policy).

Non-statutory Policies

7.4.4 In 1994 the UK Government ratified the Convention on Biological Diversity and published the UK Biodiversity Action Plan (BAP). In 2012 the UK Post-2010 Biodiversity Framework was published which sets out the objectives for biodiversity in the UK until 2020. The habitats and species listed in this framework are the same as those listed in the now defunct UK BAP, but are now referred to as Priority Habitats and Priority Species.

7.4.5 BAPs define actions and measures to meet the objectives defined in a strategy and specify measurable targets. Accordingly, BAPs determine the broad habitats and species that are of value to the natural environment of the UK and identify actions and projects that could be undertaken to help protect or enhance the national biodiversity. The UK BAP species relate to the requirement of Section 7 of the Environment Act 2016 (Wales) - and are defined as species and habitats of 'principal importance' under this Act.

7.4.6 Section 7 of the Environment Act places a legal duty on every public authority in Wales to have regard to the purpose of conserving biodiversity. Local biodiversity projects and partnerships have been set up to manage local lists of Priority Habitats and Species and implement BAPs for each. LBAPs have no statutory status but provide a framework for implementing conservation objectives. The Snowdonia LBAP and Gwynedd LBAP are considered in this Environmental Appraisal.

7.4.7 Local wildlife sites (or county wildlife sites or sites of importance for nature conservation) are sites of local conservation interest designated by the local planning authority.

7.5 Existing Environment

7.5.1 The following description of the baseline conditions is based upon a review of Figure 7.1 as well as the detailed preliminary ecological appraisal (PEA) (Appendix 7A), which includes an Extended Phase 1 Habitat Survey and desk study data, including biological records, online data sources and aerial photography. Results of Phase 2 surveys carried out in 2016 and 2018 are also presented (as detailed in Appendix 7B). The Extended Phase 1 Habitat Survey map is presented in Figure 7.2.

Designated Sites

7.5.2 Information from the MAGIC website and Cofnod identified a number of statutory and non-statutory designated sites within or in close proximity to the Site Boundary. Internationally and nationally designated sites identified are described below. The location of statutory designated sites is shown in Figure 7.1.

7.5.3 There is one designated site partly within the Site Boundary which is of international importance:

- The Dwyryd Estuary and river valley has a high importance for wildlife and habitats. It is designated at an international level as part of the Lleyn Peninsula and the Sarnau (Pen Llyn a'r Sarnau) European Marine Site encompassing Lleyn Peninsula and the Sarnau (Pen Llyn a'r Sarnau) SAC. At a national level it is designated as part of the Morfa Harlech SSSI and Morfa Harlech National Nature Reserve (NNR).

7.5.4 There is one further designated site within the Desk Study Area which is of international importance:

- Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC is adjacent to the Site Boundary at its closest point (at the western side). The site is predominantly old sessile oak (*Quercus petraea*) woods with notable populations of lichen and bryophytes, alluvial forests and also contains lesser horseshoe bat (*Rhinolophus hipposideros*) maternity roosts.

7.5.5 As part of the ecological appraisal process, there will be a requirement for assessment of the Proposed Project under the Conservation of Habitats and Species Regulations (as amended) 2017. In addition, a Habitat Regulations Assessment and a statement to inform an appropriate assessment has been produced (Appendix 7C) to address impacts and proposed mitigation for the Meirionnydd Oakwoods and Bat Sites SAC. It will be necessary to avoid adverse effects on the interest features of these three designations in order to avoid a conclusion of adverse effects on the integrity of the European sites.

7.5.6 There are three designated sites which partially lie within or immediately adjacent to the Site Boundary which are of national importance:

- The Morfa Harlech SSSI is of special interest for its geomorphological and biological (terrestrial and marine) features. SSSI features include the geomorphology, marine features, terrestrial habitats (sand dunes and salt marsh), nationally rare plants and animals (breeding bird assemblage, wintering pintail, sand lizard, otter, water vole, the nationally rare mining bee and invertebrate assemblage);
- Ysbyty Bron Y Garth SSSI is also located to the north and east of Minffordd. The SSSI is designated for its population of breeding lesser horseshoe bats, considered to be rare and endangered in Europe. Ysbyty Bron Y Garth is a hospital building (Grade II listed) situated between the floodplains of the Afon Glaslyn and Afon Dwyryd in the town of Minffordd, 3km east of Porthmadog; and
- Glaslyn SSSI. This site is predominantly marsh, floodplain grassland, riverine habitat, vascular plants, alluvial wet woodland and has a good breeding bird assemblage and is also home to a rare snail (*Vertigo lilljeborgi*) and lesser horseshoe bat maternity roosts.

7.5.7 There are five further designated sites within the wider Desk Study Area which are of national importance:

- The Morfa Harlech NNR includes a large part of the Glaslyn/Dwyryd Estuary. Here, the sand flats and salt marsh are important winter wildfowl feeding grounds, the numbers of overwintering pintail are nationally significant, and otters and water voles use the estuary's waterways. This site is approximately 220m southwest from the Area of Search for Permanent and Temporary Works with good connectivity in between;
- The Coedydd Dyffryn Ffestiniog (Gogleddol) SSSI is *c.*880 m north of the Area of Search for Permanent and Temporary Works separated by a road network. The habitats included are predominantly sessile oak woodlands with notable lichen and

bryophytes. Faunal interest includes an interesting woodland bird assemblage and lesser horseshoe bats;

- *c.*1.2 km north of the Area of Search for Permanent and Temporary Works is the Mwyngloddiau Llanfrothen SSSI. This area is designated for its hibernating lesser horseshoe bats. The Site is separated from this SSSI by a large road network and areas of built-up development;
- Dolorgon Barn SSSI is *c.*1.7 km south of the Area of Search for Permanent and Temporary Works, separated by a road network. This SSSI is designated due to its lesser horseshoe bat maternity roost; and
- Maes Meillion a Gefail-y-Cwm SSSI is *c.*1.9 km south of the Area of Search for Permanent and Temporary Works with a road network separating them. The reason for designation is the presence of species-rich grasslands and associated habitats including wet pasture, flush and swamp.

7.5.8 There are eighteen non-statutory designated sites in the Desk Study Area, with four of these located adjacent to the Area of Search for Permanent and Temporary Works and a further nine located within 1km. One non-statutory designated site (Bron Y Garth Hospital Wildlife Site) has been identified partly within the Site Boundary and Traeth Glaslyn North Wales Wildlife Trust site is immediately adjacent to the Site Boundary. Of the 18 identified sites, 16 of these are designated as Wildlife Sites (WS) and two as North Wales Wildlife Trust (NWWT) sites. Both designations are considered of local importance for nature conservation. The following designated sites are located within 1km of the search area:

- Abergafren WS;
- Bron Y Garth Hospital WS;
- Gwaith Powdwr WS;
- Gwaith Powdwr NWWT;
- Traeth Glaslyn NWWT;
- Pen-y-Bryn WS;
- Maes-y-coed woods WS;
- Cae Canol WS;
- Borthwen WS;
- Pen-y-Bwlch WS;
- Coed-y- Garth WS;
- Portmeirion Woodlands WS; and
- Coedydd Caemerched WS.

Extended Phase 1 Habitat Survey

7.5.9 The following habitats were recorded during the Extended Phase 1 Habitat Survey. Detailed habitat descriptions and a map of their distribution are provided in Appendix 7A:

- Saltmarsh;
- Valley Mire;
- Intertidal mud/sand;
- Grassland (poor semi-improved, improved);

- Broad-leaved parkland/scattered trees;
- Scrub and tree habitats including scattered scrub, some mosaic habitat and mixed parkland;
- Broadleaved woodland-semi-natural and both broadleaved and coniferous woodland-plantation;
- Cultivated/disturbed land-amenity grassland;
- Introduced shrub;
- Aquatic habitats such as standing and running water;
- Hedgerow;
- Bracken; and
- Other less vegetated habitats such as bare ground, wall, hard standing, buildings.

7.5.10 The Section 7 listed (Environment Act 2016) common toad was recorded within the Area of Search.

7.5.11 There is potentially suitable habitat for other Section 7 species including moths, hedgehog, brown hare, polecat and pine marten.

Phase 2 Surveys

7.5.12 The following Phase 2 surveys were carried out at the site in 2016 and 2018 by RSK Environment Ltd. Botanical surveys are provided in Appendix 7A and animal surveys in Appendix 7B. The results are summarised below.

Phase 2 Vegetation Survey- NVC (2016)

7.5.13 Habitats of value were identified during the Extended Phase 1 Habitat Survey, which could not be fully surveyed botanically due to the time of year.

7.5.14 A full botanical survey was undertaken in June 2016 on all habitats identified as of high value and to be potentially affected by the Proposed Project. Methods used followed the NVC Users' Handbook (Rodwell, 2006).

7.5.15 Botanical surveys included National Vegetation Classification surveys of grasslands and important habitats. Quadrat sampling was used to show that grasslands are improved and semi-improved agricultural grasslands.

7.5.16 Plant communities typical of mires were identified in the tunnel head house and new Sealing End Compound (SEC) areas to the east of the estuary. The mires in particular have modest to high plant diversity with a number of specialist species and are therefore considered to have value to nature conservation. The mire communities are listed as UK Priority Habitats. UK Priority Habitats have some protection under the planning system.

Hedgerow Survey (2016)

7.5.17 Hedgerows within the Ecological Survey Area were surveyed in July 2016 following the 'hedgerow evaluation and grading system' (HEGS), following methods set out in Clements & Toft (1992). This method requires surveying of the entire length of each hedgerow potentially affected by the works. Important features would be recorded, such as:

- notable flora and fauna;
- dimensions (height, length, width);
- number of gaps;

- whether they contain trees; and
- other associated features (i.e. ditch).

7.5.18 Hedgerows categorised as 'important' under the Hedgerows Regulations Act 1997 would be recorded.

7.5.19 None of the hedgerows within the Ecological Survey Area were categorised as of nature conservation value and they are not important under the Hedgerows Regulations.

Water Vole

7.5.20 Water courses on the site and in particular the brook in the east of the Ecological Survey Area are considered suitable habitat for water vole. All suitable watercourses within the Ecological Survey Area and within a 50m buffer (where access allowed) were surveyed for signs of water vole and a full habitat assessment was undertaken. These surveys were conducted on two visits between March and September 2016 when water voles are most active and followed guidelines set out in the Water Vole Mitigation Guidelines, (Strachan et al., 2016). These surveys were updated in May and August 2018. Field signs recorded would include: faeces, latrines, feeding stations, burrows, nests, runways in vegetation and footprints.

7.5.21 While the ditches and watercourses were classified as suitable, no evidence of water vole was recorded during any of the surveys

Otter

7.5.22 Evidence of otter was found within the Ecological Survey Area (as reported in the PEA, Appendix 7A). These waterbodies and adjacent habitats were surveyed in 2016 and 2018 for signs of otter to establish the levels of activity and establish if holts are present.

7.5.23 Otter surveys involved searches for field signs including the following: spraints, sign heaps (e.g. twisted grass, silt heaps with spraints), footprints, otter holt /resting sites and feeding remains. Surveys were carried out at the same time as the water vole surveys in 2016 and 2018.The survey followed a modified methodology of the standard methodology of Lenton et al. (1980).

7.5.24 Evidence of otter activity was recorded at two locations, one to the north of the Ecological Survey Area and one adjacent to the mire at the east of the Ecological Survey Area.

Wintering Bird Surveys

7.5.25 Suitable habitat for wintering birds was recorded within the Ecological Survey Area and therefore wintering bird surveys were required to assess the bird assemblage. These surveys were carried out in winter 2015/2016 and have been updated in winter 2017/2018. Surveys were undertaken in accordance with Gilbert et al. (2001).

7.5.26 Survey results suggest regular presence of redshank (*Tringa totanus*), pintail (*Anas acuta*), black-headed gull (*Larus ridibundus*), mallard (*Anas platyrhynchos)* and teal (*Anas crecca*). There are large populations of Canada goose (*Branta canadensis*). Lower populations of cormorant (*Phalacrocorax carbo*), little grebe (*Tachybaptus ruficollis*), oystercatcher (*Haematopus ostralegus*), goosander (*Mergus merganser*), curlew (*Numenius arquata*), snipe (*Gallinago gallinago*), herring gull (*Larus argentatus*), shelduck (*Tadorna tadorna*), great black-backed gull (*Larus marinus*), little egret (*Egretta garzetta*), grey heron (*Ardea cinerea*), kingfisher (*Alcedo atthis*), lesser black-backed gull (*Larus fuscus*), goldeneye (*Bucephala clangula*), wigeon (*Anas penelope*) and barnacle goose (*Branta leucopsis*).

Invasive Plant Surveys

7.5.27 Japanese Knotweed was recorded during the Extended Phase 1 Habitat Survey. A survey of the Ecological Survey Area for invasive species was carried out in summer 2016 and repeated in summer 2018. This recorded *Crassula helmsii* (New Zealand Pigmyweed), *Crocosmia ×crocosmiiflora* (Montbretia), *Fallopia japonica* (Japanese Knotweed) and *Parthenocissus quinquefolia* (Virginia-creeper) at various locations in the Ecological Survey Area, primarily to the north west of the estuary.

Bat Surveys

7.5.28 All suitable buildings and mature trees potentially affected by the Proposed Project were assessed for their potential for roosting bats. No buildings suitable for roosting bats will be affected by the Proposed Project and therefore buildings are not considered further.

7.5.29 Six mature trees with features suitable for roosting bats were identified in 2018. A further four trees were identified in 2019. These were assessed through aerial inspection in 2018 and 2019 and no evidence of use by bats was recorded.

7.5.30 Bat activity surveys, again following published guidance (Collins, J. (ed), 2016), were carried out in 2016 and 2018. The areas covered by the surveys included suitable foraging and commuting habitat within and adjacent to the Ysbyty Bron Y Garth SSSI and Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC, as agreed with the statutory consultees. Surveys in 2018 also included the valley mire habitat around the proposed tunnel head house location to the east of the estuary. Walked transects were devised to incorporate linear features, foraging habitat and habitats of particular interest (i.e. waterbodies, woodland etc.). The walked transects were supplemented using static detectors. Surveys were completed between April and September 2016 and again between April and September 2018.

7.5.31 During the transect surveys bat foraging and commuting activity was recorded in association with hedgerows, lines of trees and woodland edges with concentrated activity along the woodland edge adjacent to the SAC.

Reptiles Surveys

7.5.32 Reptiles were surveyed using a combination of Visual Encounter Survey and Artificial Refuge Survey. Suitable habitat within the Ecological Survey Area, potentially affected by the works were surveyed on a minimum of seven occasions to establish presence (Froglife, 1999). Surveys were carried out in 2016 and repeated in April and May 2018.

7.5.33 Reptiles are present throughout the Ecological Survey Area including Common Lizard, Slow-worm, Adder and Grass Snake. The highest number of reptiles was found within the valley mire area in location 5 (Appendix 7B) and the greatest concentration was a good population of Common Lizard at location 4 (Appendix 7B).

Badger Surveys

7.5.34 Evidence of badgers was recorded during the Extended Phase 1 Habitat Survey and a full badger survey of the Ecological Survey Area was carried out in 2016 and 2018. The surveys were to establish the level of activity on site and establish the status of setts and important foraging areas in accordance with published description and criteria (Cresswell, Harris & Jeffries, 1989).

7.5.35 Badger activity is high within the north-western end of the site and this area provides extensive suitable habitat for sett building and foraging.

7.5.36 There are four outlier setts within the site boundary. Due to the high levels of badger activity and the large number of badgers seen during the bat activity transects, it is likely

that there is a main sett outside the Ecological Survey Area boundary, probably close to where the Badgers were seen.

Other Species Surveys

7.5.37 The Ecological Survey Area provides a range of habitats for other species including Environment Act species such as moths, polecat, pine marten, brown hare and hedgehog. Habitat suitable for these species was also recorded during the Extended Phase 1 Habitat Survey.

7.5.38 No evidence of polecat, pine marten hedgehog or brown hare was recorded during any surveys in 2016 or 2018. Habitats suitable for these species, as well as moths, are present at the site, but are likely only to be temporarily affected by the proposed works.

7.5.39 Details of the arboricultural survey completed for the Proposed Project are provided in Chapter 6 (Landscape and Visual – Appendix 6D).

Issues to be Scoped Out

7.5.40 Based on the results of baseline surveys, the following ecological receptors or potential impacts have been scoped out of the appraisal in this chapter. This is either due to absence during baseline surveys or due to the intrinsic value of the receptor or impacts upon the receptor being classed as negligible.

- Saltmarsh and Lleyn Peninsula and the Sarnau (Pen Llyn a'r Sarnau) European Marine Site (addressed Chapter 16 Marine Ecology);
- Non-statutory designated sites outside of the Site Boundary – no impacts anticipated on any non-statutory sites outside of the site boundary
- Grassland (improved) – negligible value;
- Broad-leaved parkland/scattered trees – negligible value;
- Scrub and tree habitats including scattered scrub, some mosaic habitat and mixed parkland – negligible value;
- Cultivated/disturbed land-amenity grassland – negligible value;
- Bracken – negligible value;
- Other less vegetated habitats such as bare ground, inland cliff, quarry, wall, hard standing, buildings – negligible value;
- Fish – no impacts anticipated;
- Water Voles – no impacts anticipated (none recorded); and
- Other species including, moths, polecat, pine marten, brown hare and hedgehog – no impacts anticipated.

Issues to be Scoped In

7.5.41 The following ecological features/ receptors are assessed in this Chapter:

- Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC
- Bron Y Garth SSSI (including Bron Y Garth WS);
- Glaslyn SSSI (including Traeth Glaslyn NWWT site);
- Grassland (semi-improved);
- Valley Mire (Priority Habitat);

- Broadleaved woodland-semi-natural and both broadleaved and coniferous woodland-plantation;
- Invasive plant species;
- Aquatic habitats such as standing and running water;
- Hedgerow (Priority Habitat)
- Bats;
- Badger;
- Breeding and Wintering Birds;
- Otter;
- Reptiles; and
- Toads.

7.5.42 Table 7.3 lists the nature conservation importance assigned to the important ecological features acknowledged in this assessment. The value of the ecological features has been assigned on a site-by-site (i.e. project-specific) basis. Therefore, Table 7.3 lists first the value of the ecological features implied by legislation or nature conservation designations, and second the value in context of the Proposed Project, the Site and its surroundings. Where species surveys have been undertaken and a species ruled out as being present or unlikely to be present this species is not considered further in this assessment.

Table 7.3: Nature conservation value of each ecological receptor

Ecological Feature	General UK Value Inferred by Legislation and Action Plans	Intrinsic Value of the Feature in the Context of the Development Area	Justification of Intrinsic Value of Feature in the Context of the Proposed Project in Reference to Baseline
Meirionnydd Oakwoods and Bat Sites SAC	International importance as it is a European designated site	International	Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC, at it's closest point, is adjacent to the Site Boundary at the western side. The site is predominantly old sessile oak (*Quercus petraea*) woods with notable populations of lichen and bryophytes, alluvial forests and also contains lesser horseshoe bat (*Rhinolophus hipposideros*) maternity roosts
Bron Y Garth SSSI (and Bron Y Garth WS)	National, statutory designated site	National	Ysbyty Bron Y Garth SSSI is located to the north and east of Minfordd. The SSSI is designated for its population of breeding lesser horseshoe bats, considered to be rare and endangered in Europe. Ysbyty Bron Y Garth is a hospital building (Grade II listed) situated between the floodplains of the Afon Glaslyn and Afon Dwyryd in the town of Minfordd, 3km east of Porthmadog. The boundary of the SSSI includes the Bron Y Garth Wildlife Site and both are considered under this Ecological Feature. The SSSI and WS includes land within the Site Boundary.
Glaslyn SSSI (and Traeth Glaslyn NWWT site)	National, statutory designated site	National	This site is predominantly marsh, floodplain grassland, riverine habitat, vascular plants, alluvial wet woodland and has a good breeding bird assemblage and is also home to a rare snail (*Vertigo lilljeborgi*) and lesser horseshoe bat maternity roosts. It is adjacent to the Site Boundary. The Traeth Glaslyn NWWT site is contained within the SSSI boundary and is considered under this Ecological Feature.
Grassland (semi-improved)	County, listed on the Local Biodiversity Action Plan under Coastal & Floodplain Grazing Marsh	Local	The semi-improved grasslands in the north west of the Site Boundary could qualify under the Local BAP habitat criteria.

Ecological Feature	General UK Value Inferred by Legislation and Action Plans	Intrinsic Value of the Feature in the Context of the Development Area	Justification of Intrinsic Value of Feature in the Context of the Proposed Project in Reference to Baseline
Valley Mire	National, as valley mire is included in the Upland Flushes, Fens and Swamps UK Priority Habitat and is also included on the Snowdonia Local BAP under Blanket Mire and Purple Moor Grass and Rush Pastures	County	Valley mire habitat is found extensively on the eastern side of the estuary, within the Site Boundary. Part of this habitat is will be permanently lost to the development with other parts being temporarily affected.
Broad-leaved semi-natural woodland	National, as broad-leaved semi-natural woodland is a UK BAP habitat (referred to as deciduous woodland).	Local. It should be noted that the Extended Phase 1 Habitat Survey undertaken recorded that in nature conservation terms these areas of woodland were not particularly species diverse.	The woodland areas across the Ecological Survey Area are limited to areas on steep slopes around railway embankments at the west of the site and will not be permanently lost. Some temporary loss of woodland will take place as part of the project. A plan showing details of tree removal is provided in Appendix 6D (Arboricultural Report) to the Landscape and Visual chapter. The woodland contains a mix of species including some mature *Quercus robur* (Pedunculate Oak). Other trees include *Fraxinus excelsior* (Ash) and *Acer pseudoplatanus* (Sycamore). There are some willows in the wetter areas, *Salix cinerea* (Grey Willow) and *Salix caprea* (Goat Willow). The understorey has *Anthriscus sylvestris* (Cow Parsley), *Geum urbanum* (Wood Avens) and *Anemone nemorosa* (Wood Anemone). Woodlands are important for a wide range of species and provide green corridors allowing screening and cover for species to disperse through to the wider landscape.

Ecological Feature	General UK Value Inferred by Legislation and Action Plans	Intrinsic Value of the Feature in the Context of the Development Area	Justification of Intrinsic Value of Feature in the Context of the Proposed Project in Reference to Baseline
Invasive Plant Species	N/A Listed on Schedule 9 of the Wildlife and Countryside Act	Local	Invasive species have been recorded primarily across on the western side of the estuary. Works may cause the spread of these species, in the absence of mitigation.
Hedgerows	National, as hedgerows (with 80% or more cover of at least one woody UK native species) are a UK Priority Habitats	Local	There is one hedgerow in the Ecological Survey Area, partly within the Site Boundary. It was not identified as Important under the Hedgerow Regulations 1997. However, as native species are present it does qualify as a UK Priority Habitat, although it is not species diverse. It is worth noting that most hedgerows would qualify as a Habitat of Principal Importance or a local BAP habitat because they only need to have 80% or more cover of at least one woody UK native species. Hedgerows are important habitat for many species of birds, bats, insects, and reptiles (*e.g.* 130 priority BAP species are known to be significantly associated with hedgerows) and provide important wildlife habitat and corridors linking other habitats.
Aquatic Habitat	National, as oligotrophic standing waters are a UK Priority Habitat	Local	There are several ditches and streams present in the Ecological Survey Area, however these are predominantly species poor and of low conservation value. The ditches do not fit the UK Priority Habitat criteria and are not managed for biodiversity, so they are of site importance only. The ditches and stream within the valley mire habitat contribute to the hydrology of this area but are considered as part of that ecological receptor. Some of the ditches and streams do have evidence of use by protected species, such as Otter and Grass Snake. Impacts on these

Ecological Feature	General UK Value Inferred by Legislation and Action Plans	Intrinsic Value of the Feature in the Context of the Development Area	Justification of Intrinsic Value of Feature in the Context of the Proposed Project in Reference to Baseline
			species are discussed separately.
Bats (commuting and foraging)	International, bats are listed as a European Protected Species in the Habitats and Species Regulations, 2010.	County	The intrinsic value is considered to be County based on the background data search, a review of the habitats on and surrounding the Site, and the results of the bat activity surveys. From the background data search, there are designated sites adjacent to and in close proximity to the Site Boundary which are designated for the presence of Lesser Horseshoe bats. The areas of semi-improved neutral grassland, valley mire and broad-leaved semi-natural woodland as well as the habitats on the field boundaries (hedgerows, scrub and lines of scattered broad-leaved trees) provide suitable habitat for foraging and commuting bats. These habitats are also connected to suitable habitat in the surrounding landscape and have been assessed as being of moderate potential as a commuting and foraging habitat for bats. The surveys recorded Common Pipistrelle, Soprano Pipistrelle, *Myotis* sp, *Nyctalus* sp, Brown Long-eared bat, Lesser Horseshoe bat and Greater Horseshoe bat using the site to commute through and forage in. Activity was recorded adjacent to the SAC and also around the valley mire habitat.
Bats (roosting)	International, bats are listed as a European Protected Species in the Habitats and Species Regulations, 2010.	Local	Ten trees with suitability for roosting bats were recorded in the Ecological Survey Area. The trees are of local importance for bats as while they are suitable, they currently do not have any evidence of use by bats.

Ecological Feature	General UK Value Inferred by Legislation and Action Plans	Intrinsic Value of the Feature in the Context of the Development Area	Justification of Intrinsic Value of Feature in the Context of the Proposed Project in Reference to Baseline
Badger	National, protected by the Protection of Badgers Act	Local	Four single hole outlier setts have been recorded as well as foraging activity in the north west of the site. No main setts have been recorded. OHL removal will take place close to but beyond 30 m from the current know location of active Badger setts.
Breeding and Wintering Birds	Local, Key legislation relating to birds is the Wildlife and Countryside Act, 1981 (as amended). Many bird species are listed as a UK Priority Species.	Local	The woodland, hedgerows and grassland margins in the Site Boundary provide suitable nesting habitat for low numbers of common species of bird. The wintering bird assessment recorded low numbers of relatively common species associated with the marine environment only.
Otter	National, listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and listed as a European Protected Species on Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations 1994. The Otter is included as a Priority Species in the UK Biodiversity Action Plan (UKBAP)	Local	Otters are known to be present in the local area and field signs have been recorded in the east and west of the Ecological Survey Area. No holts are present within the Site Boundary.

Ecological Feature	General UK Value Inferred by Legislation and Action Plans	Intrinsic Value of the Feature in the Context of the Development Area	Justification of Intrinsic Value of Feature in the Context of the Proposed Project in Reference to Baseline
Reptiles	National, listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)	Local	Reptiles are present in suitable habitats across the Ecological Survey Area and within the Site Boundary. Some of these habitats are due to be permanently lost and others will be temporarily affected.
Toads	Local, Toads are listed as UK Priority Species	Local	There are records of toads present in the local area, although none have been recorded incidentally during the surveys in 2016 or 2018.

7.6 Key Parameters for Appraisal

The Proposed Project

7.6.1 A detailed description of the Proposed Project is provided in Chapter 2 (Project Description). The following aspects of the Proposed Project are relevant to this Chapter:

7.6.2 The site preparation and construction works, especially:

- Vegetation clearance;
- Removal of top-soil;
- Areas for plant maintenance, site offices and compound areas;
- Storage areas for construction and for excavated materials;
- Acoustic disturbance from construction activities;
- Dust generation; and
- Lighting during preparation and construction.

7.6.3 Land uses within the operational Proposed Project in particular:

- New and upgraded infrastructure works;
- New access roads and utilities;
- New drainage; and
- Lighting.

7.6.4 Impacts during the decommissioning process:

- Vegetation clearance and disturbance of habitats;
- Areas for plant maintenance and site offices/ compound areas;
- Storage areas for materials;
- Acoustic disturbance from construction activities;
- Dust generation; and
- Lighting during decommissioning.

Embedded Mitigation

7.6.5 The following embedded mitigation has been taken into consideration when appraising the ecological impacts of the Proposed Project:

- High value habitats have been avoided where possible. The tunnel head house at the west of the Proposed Project has been positioned in grassland of low ecological value. The tunnel head house and SEC at the eastern side are within an area of valley mire habitat but have been positioned to be primarily in areas of lower ecological value, such as scrub and Bracken.
- Implementation of the measures contained within the Outline Peat Management Plan (which forms an appendix to the Outline CEMP presented in Appendix 2A) to reduce impacts on valley mire habitats. Damage to the valley mire habitat will be minimised through construction measures including:
    - Defined construction footprint, within which all construction related activity will take place;

  - Use of temporary working surfaces (bog mats, aluminium rafts or similar) where required;
  - Excavating only the minimum depth and extent of peat required for any given element of the infrastructure; and
  - Use of non-vegetated areas for temporary storage and excluding construction traffic from any vegetated surface.
  - All vegetation management will be undertaken using appropriate low ground pressure plant to avoid the risk of the ground surface becoming broken.
- Direct land take in the Meirionnydd Oakwoods and Bat Sites SAC has been avoided. Construction works have been moved to be as far away from the SAC as possible, within the fields where construction is to take place.
- Implementation of the measures contained within the Outline Construction Environmental Management Plan (CEMP) (see Appendix 2A).
- The use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter. Cowls will be fitted to lighting to assist in preventing light spill on to ecologically sensitive habitats including Meirionnydd Oakwoods and Bat Sites SAC and Bron Y Garth SSSI.
- Measures contained in relevant DEFRA and Environment Agency best practice guidance on the control and removal of invasive weed species will be implemented.
- National Grid have made a commitment not to undertake the proposed works within the Dwyryd Estuary to remove the OHL during the winter bird season (November to March).
- Following the completion of all construction works, the land temporarily used within the working area will be fully reinstated as near as practically possible to its former condition or as agreed with landowners and stakeholders in advance (this will include the reinstatement of most stretches of drainage ditches and existing culverts).
- Trees which will have been removed during the construction period will be replanted as part of the landscape mitigation planting (see Figure 2.2). Areas of habitat will be restored to equivalent habitat condition post-construction. Restoration will seek to replace vegetation with the same species identified in the Extended Phase 1 Habitat Survey as far as is practicable.
- Restoration and enhancement of valley mire habitat implemented as described in principle in the Outline Habitat Management Plan (which forms an appendix to the Outline CEMP presented in Appendix 2A).
- Use of appropriate measures to prevent spillage of potentially polluting substances.
- Fuels, lubricants solvents etc will be stored in appropriately bunded areas and a range of other pollution prevention measures taken.

7.7 Predicted Impacts During Construction

7.7.1 This section uses the background data search and ecological baseline to identify potential adverse effects on the ecological features throughout the Proposed Project. All potential impacts on ecological and nature conservation resources are discussed and reviewed in order to design appropriate mitigation measures.

7.7.2 The Proposed Project will be constructed over poor-semi improved and improved grassland, valley mire, bracken, and ruderal vegetation. It is likely that some individual broad-leaved trees, hedgerow, and areas of dense scrub will also need to be removed.

7.7.3 Generic potential impacts on ecological features associated with site preparation and construction include:

- permanent loss of habitat (vegetation clearance) and species within the Site Boundary due to ground and excavation works;
- permanent loss of habitat (vegetation clearance) and species within the Site Boundary due to construction of hard-surfaces and structures;
- temporary loss of habitat through siting and subsequent removal of site offices, compounds and storage areas of construction materials, as well as final site clearance after construction;
- temporary and potentially permanent displacement of species from within the Site Boundary;
- fragmentation of habitats or severance of ecological corridors during construction;
- degradation of habitats that cannot easily be recreated;
- disturbance of species within and adjacent to the Site Boundary due to construction noise, vibration and site personnel;
- disturbance of species due to access and travel on and off the site during construction;
- environmental incidents and accidents (e.g. spillages, noise, fire and emissions);
- disturbance/displacement of species within and adjacent to the Site Boundary by an increase in artificial lighting;
- impacts on adjacent habitats (and the species that use them), for example through noise and visual disturbance; and
- rainwater runoff from hard-standing during construction.

7.7.4 Longer-term impacts, though more likely to be avoided or reduced through mitigation, may include the following in increasing order of permanence:

- modification of habitats and introduction of undesirable species (such as injurious weeds or invasive alien species) as a result of traffic movements, reinstatement works and landscaping; and
- long-term recovery of important habitats which cannot easily be recreated.

7.7.5 Where such impacts occur additional mitigation measures (beyond embedded mitigation) will be adopted to help eliminate or offset impacts.

Tunnel Head House, Sealing End Compounds and 400kV Cable (Undergrounding)

Infrastructure Western Side of the Dwyryd Estuary

Statutory Designated Sites

7.7.6 Due to the distance from the proposed infrastructure works on the western side of Dwyrd Estuary it is highly unlikely that there will be any direct or indirect impacts on the Morfa Harlech SSSI.

7.7.7 Impacts on the Dwyryd Estuary and associated Lleyn Peninsula and the Sarnau (Pen Llyn a'r Sarnau) European Marine Site are discussed in Chapter 16 (Marine Ecology).

7.7.8 The Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC, Bron Y Garth SSSI and Glaslyn SSSI are adjacent to the proposed infrastructure works on the western side of the Dwyrd Estuary.

7.7.9 There will be no direct habitat loss on Meirionnydd Oakwoods and Bat Sites SAC during construction because the site is outside of the Site Boundary. There is the potential for direct and indirect impacts on the species for which the SAC is classified (in this case Lesser Horseshoe bats and lichens) during construction through artificial lighting, noise and dust.

7.7.10 There will be no direct habitat loss in Bron Y Garth SSSI during construction because the proposed works are outside of the designated site boundary. There is the potential for direct and indirect impacts on the species for which the SSSI is classified (in this case Lesser Horseshoe bats) during construction through artificial lighting and noise.

7.7.11 There will be no direct impact on Glaslyn SSSI during construction because the proposed works are outside of the designated site boundary. There is the potential for indirect impacts on the SSSI and the species for which it is classified during construction through installation of a surface water discharge pipeline into the estuary. With the implementation of measures in the CEMP, there are not anticipated to be any impacts on Glaslyn SSSI from dust or run off during construction.

7.7.12 As the proposals are non-residential there will not be an increase in visitors using the SAC or SSSI and there will not be the negative indirect effects that can occur from increased visitor pressure.

Habitats - Grassland (semi-improved)

7.7.13 There is *c.* 4.85 ha of semi-improved neutral grassland in the Site Boundary on the western side of the Dwyryd Estuary which will be temporarily or permanently lost. The field which is to be crossed by the construction compound access road has the potential to be included as part of the Coastal and Floodplain Grazing Marsh Local Biodiversity Action Plan.

7.7.14 The development will result in the temporary loss of *c.* 4.68 ha semi-improved grassland which may conform to the Local BAP habitat. The area temporarily lost will be due to the construction compound access road in the west of the site. The Coastal and Floodplain Grazing Marsh BAP grassland is considered to be of local importance.

7.7.15 There are direct impacts from construction of the access road and tunnel head house. This will result in the permanent loss of 0.17 ha of semi-improved grassland.

Habitats – Broad-leaved Woodland

7.7.16 The development will result in the temporary loss of *c.* 0.09 ha broad-leaved woodland for the construction of the SEC. The area lost is part of the construction compound and will be replanted on completion of work in this area and as part of the screening planting around the new SEC.

Habitats - Invasive plant species

7.7.17 There are several stands of invasive plant species both within and adjacent to the infrastructure works on the western side of the Dwyrd Estuary. These include *Crocosmia ×crocosmiiflora* (Montbretia) and *Fallopia japonica* (Japanese Knotweed). The stands are most common adjacent to the proposed permanent access road and within the section of direct burial of cable between the tunnel head house tunnel head house and SEC.

7.7.18 Works in these areas have the potential to cause the spread of species listed on Schedule 9 of the Wildlife and Countryside Act.

Habitats - Aquatic habitats such as standing and running water

7.7.19 There is a single dry ditch to be crossed by the construction compound access road. The ditch is of low botanical diversity.

Habitats - Hedgerow

7.7.20 There is a single hedgerow to be crossed by the construction compound access road. While this hedgerow is not important with respect to the Hedgerow Regulations, it has the potential to be classified as a Priority Habitat.

7.7.21 The development will result in the temporary loss of *c.* 23 m of hedgerow.

Protected Species – Bats (commuting and foraging)

7.7.22 Bat activity surveys have confirmed the use of the site by Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle, Myotis species, Nyctalus species, Lesser Horseshoe bat and Greater Horseshoe bat for commuting and foraging.

7.7.23 Foraging activity was focused on the SAC boundary as well as the hedgerow and woodland edges around the improved grassland fields. These habitats are also connected to suitable habitat in the surrounding landscape and have been assessed as being of moderate potential as a commuting and foraging habitat for bats (according to BCT's Good Practice Guidelines).

7.7.24 There is potential to disrupt routes used by bats commuting through the Site and habitat used for foraging. Potential disruption could include:

- The key foraging and commuting habitats will be retained (e.g. the woodland and hedgerows) but impacted temporarily. The semi-improved grassland at the Tunnel Head House and SEC will be lost, however these areas are relatively small in relation to the available foraging habitat in the local area.
- Temporary lighting and noise adjacent to commuting areas during construction.

Protected Species – Badger

7.7.25 There are no Badger setts within 30 m of the proposed works, therefore no impacts on Badger setts are anticipated within this area. The agricultural fields are used by Badgers as foraging habitat.

7.7.26 Any removal of vegetation for construction could have impacts on foraging Badgers. In addition, any open excavations could trap animals.

7.7.27 It is likely that any Badgers on the site during construction could also suffer disturbance from noise, vibration, or lighting as a result of construction activities. This may result in temporary displacement.

Protected Species Breeding Birds

7.7.28 The majority of suitable breeding bird habitat will be retained and protected. Small areas of scattered scrub, scattered broad-leaved trees and sections of hedgerow will be removed from the development footprint.

7.7.29 Any removal of vegetation for construction could have impacts on nesting birds if carried out during the bird nesting season. Unmitigated impacts could involve the destruction of nests and eggs, possibly affecting the breeding success for that season in the individual species involved.

7.7.30 It is likely that any bird species on the site during construction could also suffer disturbance from noise, vibration, dust or lighting as a result of construction activities. This may result in temporary displacement.

Protected Species – Otter

7.7.31 There are no Otter holts within close proximity of the proposed works, therefore no impacts on Otter holts within this area. The ditch crossed by the construction access road was dry and has no evidence of use by Otters, therefore the construction works are not likely to have any impact on Otters in this location.

Protected Species - Reptiles

7.7.32 Reptile surveys have confirmed the use of the site by Common Lizards. This species has been recorded in habitats that are due to be crossed by the direct burial of cable between the tunnel head house and SEC and also in habitats adjacent to the new SEC. These habitats are also connected to suitable habitat in the surrounding landscape.

7.7.33 There is potential to kill or injure reptiles as a result of the works as well as temporary loss of foraging and hibernating habitats.

Infrastructure Eastern Side of the Dwyryd Estuary

Habitats - Valley Mire

7.7.34 There is *c.* 2.17 ha of valley mire and swamp habitat within the site boundary on the eastern side of the Dwyryd Estuary. The land which is to be crossed by the construction compound access road, tunnel head house and permanent access road is included in the Upland Flushes, Fens and Swamps UK Priority Habitat and is also included on the Snowdonia Local BAP under Blanket Mire and Purple Moor Grass and Rush Pastures.

7.7.35 The development will result in the permanent loss of *c.* 0.5 ha valley mire for the construction of the tunnel head house, SEC and permanent access road. This represents 18.5% of this habitat type found in the Ecological Survey Area. In addition, there will be the temporary loss of 1.67 ha valley mire for the construction compounds. The habitat is considered to be of county importance. There is also the potential for indirect impacts from the construction of the access road resulting in degradation of adjacent habitats through changes in hydrology. Embedded mitigation (including an Outline Peat Management Plan) has been prepared to address effects on this habitat.

7.7.36 As well as embedded mitigation, additional mitigation measures have been identified. These are discussed in Section 7.10. The mitigation measures will reduce the impacts on the temporary and permanent loss of this habitat as far as possible. Due to the permanent loss of 0.5 ha of this important habitat, residual impacts will remain and the requirement for additional compensation measures is to be discussed with the consultees during the consultation process.

Habitats - Grassland (semi-improved)

7.7.37 There is *c.* 0.046 ha of semi-improved neutral grassland in the Site Boundary on the eastern side of the Dwyryd Estuary. This is primarily around the edges of the valley mire habitat.

7.7.38 The development will result in the temporary loss of *c.* 0.037 ha semi-improved grassland. The area temporarily lost will be due to the construction compound access road.

7.7.39 There is potential for direct impacts from construction which will result in the permanent loss of 0.009 ha of semi-improved grassland.

Habitats - Aquatic habitats such as standing and running water

7.7.40 There is a single ditch to be crossed by the construction compound access road and three ditches to be lost to the tunnel head house and SEC compound. The ditches within

the valley mire habitat are likely to form an important part of the drainage regime within that habitat. This will result in the permanent loss of *c.* 128 m of ditch and temporary loss of *c.* 350 m of ditch.

7.7.41 There is potential for direct impacts from construction of the access road, tunnel head house and SEC and indirect impacts through alteration of hydrology to the surrounding valley mire habitat.

Protected Species – Bats

7.7.42 Bat activity surveys have confirmed the use of the Ecological Survey Area by Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle, Myotis species, Nyctalus species, Lesser Horseshoe bat and Greater Horseshoe bat for commuting and foraging.

7.7.43 Foraging activity was focused along the woodland edge and stream along the northern edge of the fields as well as around the trees in the valley mire habitat. These habitats are also connected to suitable habitat in the surrounding landscape and have been assessed as being of moderate potential as a commuting and foraging habitat for bats (according to BCT's Good Practice Guidelines).

7.7.44 There is potential to disrupt routes used by bats commuting through the Site and habitat used for foraging. Potential disruption could include:

- The key foraging and commuting habitats will be retained (e.g. the woodland and scrub) but may be impacted temporarily through noise and lighting. The valley mire at the Tunnel Head House and SEC will be lost, however these areas are relatively small in relation to the available foraging habitat in the local area.
- Temporary lighting and noise adjacent to commuting areas during construction.

7.7.45 Preliminary roost appraisal surveys have found four mature trees with features suitable for roosting bats. These were assessed through aerial inspection in 2019 and no evidence of use by bats was recorded. These trees are proposed to be retained.

Protected Species - Breeding Birds

7.7.46 The majority of suitable breeding bird habitat will be retained and protected. Small areas of scattered scrub, scattered broad-leaved trees and some ground nesting habitat will be removed from the development footprint.

7.7.47 Any removal of vegetation for construction could have impacts on nesting birds if carried out during the bird nesting season. Unmitigated impacts could involve the destruction of nests and eggs, possibly affecting the breeding success for that season in the individual species involved.

7.7.48 It is likely that any bird species on the site during construction could also suffer disturbance from noise, vibration, dust or lighting as a result of construction activities. This may result in temporary displacement.

7.7.49 Impacts on the estuary and birds using the estuary are considered in Chapter 16 (Marine Ecology).

Protected Species – Otter

7.7.50 There are no Otter holts in close proximity to the proposed works, therefore no impacts on Otter holts within this area. The ditch crossed by the construction access road and the ditches lost to the tunnel head house and SEC all have no evidence of use by Otters, although a stream to the north, connected to the ditches, recorded a single spraint in 2016.

7.7.51 Temporary lighting and noise adjacent to the ditch and stream during construction may disturb Otters in the local area.

Protected Species – Reptiles

7.7.52 Reptile surveys have confirmed the use of the site by Common Lizards, Grass Snake, Slow-worm and Adder. These species have been recorded in habitats that are due to be permanently lost to the tunnel head house and SEC and access road or temporarily lost to the new pylon and construction compound. These habitats are also connected to suitable habitat in the surrounding landscape.

7.7.53 There is potential to kill or injure reptiles as a result of the works as well as temporary and permanent loss of foraging and hibernating habitats.

Protected Species - Toads

7.7.54 Toads were recorded at the site during the reptile surveys. This species has been recorded in habitats that are due to be permanently lost to the tunnel head house and SEC and access road.

7.7.55 There is potential to kill or injure toads as a result of the works as well as permanent loss of foraging and hibernating habitats.

Removal of Existing Infrastructure (VIP subsection)

Statutory Designated Sites

7.7.56 Due to the distance from the removal of existing infrastructure works it is highly unlikely that there will be any direct or indirect impacts on the Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC or Glaslyn SSSI.

7.7.57 Impacts on the Dwyryd Estuary and associated Lleyn Peninsula and the Sarnau (Pen Llyn a'r Sarnau) European Marine Site and the Morfa Harlech SSSI are discussed in Chapter 16 (Marine Ecology).

7.7.58 Works to remove the existing infrastructure at pylons 4ZC036 and 4ZC035 will take place in the Ysbyty Bron Y Garth SSSI. The SSSI is designated due to the population of Lesser Horseshoe Bats. The removal of the pylons and OHL in the SSSI boundary will take place during daylight hours, therefore there will be no noise impacts on the bats in the SSSI.

7.7.59 There will be no direct or indirect impact on the Lesser Horseshoe Bats or the habitats on which they rely, in the Bron Y Garth SSSI during the removal of the existing infrastructure. Some vegetation and scrub removal will be required, but this is not anticipated to impact on the foraging and commuting habitat of the bats.

7.7.60 The proposals are non-residential. Therefore, there will not be an increase in visitors using the SSSI and there will not be the negative indirect effects that can occur from increased visitor pressure.

Habitats - Valley Mire

7.7.61 Removal of conductors will require the construction of scaffolds and scaffold stay areas. At the eastern end of the Site Boundary, the scaffold will be constructed in areas of Valley Mire. As this habitat is wet and the ground is unstable, the scaffold will require import of stone to create a solid base. This will result in the temporary loss of *c.* 0.05 ha of valley mire. Embedded mitigation (including an Outline Peat Management Plan) has been prepared to address effects on this habitat.

7.7.62 In this location, the remaining land which is to be affected during the removal of existing infrastructure is predominantly scrub and *Pteridium aquilinum* (Bracken). While the surrounding area includes valley mire habitat, the base of the pylon does not have any habitats included in the Upland Flushes, Fens and Swamps UK Priority Habitat and is

not included on the Snowdonia Local BAP under Blanket Mire and Purple Moor Grass and Rush Pastures.

7.7.63 As detailed in Section 7.2.4, OHL works will take place further to the east, between Pylons 4ZC026 and 4ZC025. Ecological surveys have not been carried out in this area as the works will not take place for a number of years. An assessment of the impacts has not been included here, although impacts are unlikely as the proposed works will be short-term, temporary and use light vehicle traffic only. A review of aerial imagery suggests the area is dominated by Bracken, however an ecological walkover of this area will be carried out to identify any constraints prior to the works taking place.

Habitats - Grassland (semi-improved)

7.7.64 The removal of existing infrastructure will result in the temporary loss of *c.* 0.32 ha semi-improved grassland, however this will take place in areas where the grassland does not conform to the Local BAP habitat criteria. The area temporarily lost will be due to the construction compounds and crane pads required for the removal of the existing infrastructure.

Habitats - Broadleaved woodland-semi-natural and both broadleaved and coniferous woodland-plantation

7.7.65 There are areas of semi-natural broadleaved woodland which are crossed by the OHL between pylons 4ZC037 and 4ZC034. The woodland blocks in the survey area have been assessed as being of local importance.

7.7.66 The removal of existing infrastructure will result in the temporary loss of *c.* 0.02 ha of woodland due to construction of access roads and during the removal of pylons. Removal of conductors will require the construction of scaffolds and scaffold stay areas which will result in the temporary loss of *c.* 0.023 ha of woodland.

7.7.67 In addition, it is possible that removal works may damage the canopy of individual trees and therefore degrade the condition of the woodland.

Habitats - Invasive plant species

7.7.68 There are several stands of invasive plant species both within and adjacent to the footprint for the removal of existing infrastructure and the associated works compounds and access routes. These include:

- 4ZC037 - *Crocosmia ×crocosmiiflora* (Montbretia) and *Fallopia japonica* (Japanese Knotweed) adjacent to the access route;
- 4ZC036 – *Fallopia japonica* (Japanese Knotweed) at the base of the pylon and adjacent to the access route;
- 4ZC032 – *Fallopia japonica* (Japanese Knotweed) and *Parthenocissus quinquefolia* (Virginia-creeper) adjacent to the access route at the level crossing.
- *Fallopia japonica* (Japanese Knotweed) and *Crocosmia ×crocosmiiflora* (Montbretia) adjacent to the proposed works compound to the north of the railway line.

7.7.69 Works in these areas have the potential to cause the spread of species listed on Schedule 9 of the Wildlife and Countryside Act.

Habitats - Aquatic habitats such as standing and running water

7.7.70 There are several ditches crossed by the OHL and by the proposed access routes to each works area. The ditches are of low botanical diversity and will not be affected by the works.

Protected Species - Bats

7.7.71 Bat activity surveys have confirmed the presence of foraging and commuting Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle, Myotis species, Nyctalus species, Lesser Horseshoe bat and Greater Horseshoe bat. There will be no direct or indirect impact on foraging or commuting bats or the habitats on which they rely during the removal of the existing infrastructure.

7.7.72 Preliminary roost appraisal surveys have found six mature trees with features suitable for roosting bats. These were assessed through aerial inspection in 2018 and no evidence of use by bats was recorded. The removal of existing infrastructure will not result in any direct habitat loss, however it is possible that removal works may damage the canopy of individual trees which have suitability for roosting bats and therefore degrade the condition of the roosting features.

Protected Species - Badger

7.7.73 There are four outlier Badger setts present within 30 m of the proposed works. These setts all lie beneath the OHL. Removal of OHL is unlikely to directly affect these setts.

7.7.74 It is possible that scaffolds and temporary access tracks will be within 30 m of the setts and NRW will be consulted to determine whether a licence to close the setts is required. A method statement will be prepared to identify measures to reduce impacts on these setts during the works.

7.7.75 Any removal of vegetation for access and works compounds could have impacts on foraging Badgers. In addition, any open excavations from removal of pylon foundations could trap animals.

Protected Species - Breeding Birds

7.7.76 The majority of suitable breeding bird habitat will be retained and protected. Small areas of scattered scrub, scattered broad-leaved trees and some ground nesting habitat will be temporarily removed for the access to each pylon.

7.7.77 Any removal of vegetation for construction could have impacts on nesting birds if carried out during the bird nesting season. Unmitigated impacts could involve the destruction of nests and eggs, possibly affecting the breeding success for that season in the individual species involved.

7.7.78 It is likely that any bird species on the site during removal of existing infrastructure could also suffer disturbance from noise as a result of works activities. This may result in temporary displacement.

7.7.79 Removal of existing infrastructure will result in the loss of pylons which have been seen to be used by Ravens, amongst other species, at the site. It is possible that species such as Ravens use the pylons as nesting sites. Removal of pylons will result in the loss of potential nesting habitat for some bird species, however it is thought that the nearby cliffs provide suitable natural nesting sites for these species.

Protected Species - Wintering Birds

7.7.80 The wintering bird assessment recorded low numbers of relatively common species associated with the marine environment only. National Grid have made a commitment not to undertake the proposed works within the Dwyryd Estuary to remove the OHL during the winter bird season. There will therefore be no impact on wintering bird species during these works.

Protected Species – Otter

7.7.81 There are no Otter holts close to the proposed works, therefore no impacts on Otter holts within this area.

7.7.82 Temporary noise adjacent to ditches and streams during removal of existing infrastructure may disturb Otters in the local area.

Protected Species – Reptiles

7.7.83 Reptile surveys have confirmed the presence of Common Lizards, Grass Snakes, Slow-worms and Adders. These species have been recorded in habitats that are due to be temporarily lost during the removal of existing infrastructure. They are also present in habitats under the OHL. These habitats are also connected to suitable habitat in the surrounding landscape.

7.7.84 There is potential to kill or injure reptiles as a result of the works as well as temporary loss of foraging and hibernating habitats.

Protected Species - Toads

7.7.85 Toads were recorded at the site during the reptile surveys. This species has been recorded in habitats that are due to be temporarily lost during the removal of the existing infrastructure.

7.7.86 There is potential to kill or injure toads as a result of the works as well as temporary loss of foraging and hibernating habitats.

7.8 Predicted Impacts During Operation

Tunnel Head House, Sealing End Compounds and 400kV Cable (Undergrounding)

Infrastructure Western Side of the Dwyryd Estuary

Statutory Designated Sites

7.8.1 The Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC and Bron Y Garth SSSI are adjacent to the proposed infrastructure works on the western side of Dwyrd Estuary.

7.8.2 There will be no direct habitat loss on Meirionnydd Oakwoods and Bat Sites SAC during operation because the site is a sufficient distance away from the Proposed Project. While there is the potential for direct and indirect impacts on the species for which the SAC is classified (in this case Lesser Horseshoe bats) during operation through artificial lighting, it is anticipated that lighting will only be required during maintenance (which is short term and infrequent) and therefore no impacts are anticipated.

7.8.3 There will be no direct habitat loss on Bron Y Garth SSSI during operation because the proposed works are outside of the designated site boundary. There is the potential for direct and indirect impacts on the species for which the SSSI is classified (in this case Lesser Horseshoe bats) during operation through artificial lighting. However, it is anticipated that lighting will only be required during maintenance (which is short term and infrequent) and therefore no impacts are anticipated.

Protected Species – Bats (commuting and foraging)

7.8.4 Bat activity surveys have confirmed the use of the site by Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle, Myotis species, Nyctalus species, Lesser Horseshoe bat and Greater Horseshoe bat for commuting and foraging.

7.8.5 Foraging activity was focused on the SAC boundary as well as the hedgerow and woodland edges around the improved grassland fields. These habitats are also connected to suitable habitat in the surrounding landscape and have been assessed as being of moderate potential as a commuting and foraging habitat for bats (according to BCT's Good Practice Guidelines).

7.8.6 There is potential to disrupt routes used by bats commuting through the Site and habitat used for foraging. Potential disruption could include lighting adjacent to commuting areas. The availability of suitable foraging and commuting habitat elsewhere in the local landscape and the lighting mitigation proposed, will ensure that the impacts are negligible.

Infrastructure Eastern Side of the Dwyryd Estuary

Habitats - Valley Mire

7.8.7 The land which is to be crossed by the permanent access road is included in the Upland Flushes, Fens and Swamps UK Priority Habitat and is also included on the Snowdonia Local BAP under Blanket Mire and Purple Moor Grass and Rush Pastures.

7.8.8 The construction of the road may alter the hydrological regime of the area immediately adjacent to the road. Impacts of these alterations in hydrology are likely to take effect during the operation of the road.

7.8.9 The mire habitat is considered to be of county importance. The impacts could result in the pooling of water in areas. This is likely to result in a change in the dominant species present.

7.8.10 Mitigation for changes in hydrology and loss of habitat is provided in the Outline Peat Management Plan. Alteration of the hydrology is likely to result in the pooling of water in the mire habitat. Increasing the retention of water will be of benefit to the mire habitat, which relies on ground water at or just below the surface to maintain the typical mire species present. While the Proposed Project will result in the loss of some areas of mire habitat, the measures identified in the Outline Peat Management Plan are likely to result in an improvement in the retention of water in this area and provide additional areas of mire habitat adjacent to the site.

Protected Species – Bats

7.8.11 Bat activity surveys have confirmed the use of the site by Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle, Myotis species, Nyctalus species, Lesser Horseshoe bat and Greater Horseshoe bat for commuting and foraging.

7.8.12 Foraging activity was focused along the woodland edge and stream along the northern edge of the fields as well as around the trees in the valley mire habitat. These habitats are also connected to suitable habitat in the surrounding landscape and have been assessed as being of moderate potential as a commuting and foraging habitat for bats (according to BCT's Good Practice Guidelines).

7.8.13 There is potential to disrupt routes used by bats commuting through the Site Boundary and habitat used for foraging. Potential disruption could include lighting adjacent to commuting areas around the tunnel head house and SEC during operation.

Removal of Existing Infrastructure (VIP subsection)

Statutory Designated Sites

7.8.14 Pylons 4ZC036 and 4ZC035 will be removed from within the Ysbyty Bron Y Garth SSSI. Following pylon removal, the habitat at the base of the pylon will be reinstated. This will

improve the habitat quality within the SSSI. The works will be subject to a SSSI assent application.

Habitats - Valley Mire (Priority Habitat);

7.8.15 Following pylon removal, the habitat at the base of the pylon will be reinstated. This will improve the habitat quality and increase the area of habitat that qualifies as UK Priority Habitat and Local BAP habitat.

7.9 Predicted Impacts during Decommissioning

Tunnel Head Houses, Sealing End Compounds and 400kV Cables (Undergrounding)

7.9.1 Impact on ecological receptors as a result of decommissioning are likely to be similar to those identified for the construction phase detailed above. Due to the timescales involved between construction and proposed decommissioning (between 40 and 120 years), it is not possible to assess specific impacts due to the potential for changes in land use, habitat distribution and presence of protected species.

7.9.2 A reassessment of ecological impacts and relevant mitigation measures will be required prior to decommissioning, taking account of any changes in legislation and assessment guidance which are updated during the operational stage of the project.

7.10 Mitigation and Summary of Residual Effects

Proposed Mitigation Measures

7.10.1 Details on embedded mitigation measures are provided in Section 7.7.5. Where avoidance of impacts is not possible through embedded mitigation, additional mitigation measures are to be implemented. Monitoring requirements will be identified where appropriate.

7.10.2 For the purpose of this document, additional mitigation refers to measures to avoid or reduce negative impacts. The mitigation hierarchy has been followed in order to reduce any impacts on designated sites, important habitats and protected species.

7.10.3 The appraisal has identified that protected species licences (in relation to Badgers only) may be required. As licenses will only be awarded when NRW are satisfied that there will be no long-term adverse effects on the species/population. Mitigation strategies to demonstrate this will be agreed ahead of their implementation.

During Construction

7.10.4 Mitigation measures for impacts on designated sites (and the species for which they are designated) are contained within embedded mitigation and the Habitat Regulations Assessment (Appendix 7C).

7.10.5 The additional mitigation measures identified for the ecological receptors likely to be affected by the project, once embedded mitigation has been considered) are given below:

General

7.10.6 During construction, any litter will be removed during a weekly check by site personnel.

7.10.7 Measures will be specified to minimise dispersal of dust during dry weather including damping down of roadways, and avoidance of any activities especially liable to generate dust when strong winds are forecast, e.g. tunnelling or movement of excavated materials. The main works contractor will develop, in consultation with National Grid a

Site Waste Management Plan (SWMP). An Outline Waste Management Plan is provided as an appendix to the Outline CEMP.

7.10.8 Liquids that might contaminate surrounding land in the event of a spillage will be stored and handled, in bunded and lined enclosures designed for the containment of spills.

7.10.9 Contractors and site staff will receive a tool-box talk on the various ecological sensitivities of the development as part of their site induction.

7.10.10 Adherence to the relevant Environment Agency Pollution Prevention Guidelines during construction will substantially reduce the risk of polluting surface waters during works.

7.10.11 Ecological watching briefs would be used where impacts on habitat suitable for polecat or hedgehog cannot be completely avoided. This includes areas inside the Site Boundary that include hedgerow, scrub and rough grassland (as shown on Figure 7.2).

Habitat Reinstatement and Enhancement

7.10.12 National Grid is committed to ensuring that the Proposed Project delivers a net benefit to biodiversity rather than only ensuring there is no net loss. National Grid have sought to work closely with Snowdonia National Park Authority, Gwynedd Council and Natural Resources Wales to explore and identify opportunities to compensate for habitat and species adversely impacted by the Proposed Project. National Grid appreciate the knowledgeable input and assistance of stakeholders received to date and commit to continuing to collaborate work with all relevant stakeholders to deliver a net benefit.

7.10.13 Delivering a net benefit to biodiversity in accordance with national and local planning policy is a priority. Over and above that, National Grid will also seek opportunities to enhance existing habitat within the project boundary, or further afield. 'On site' options do include the restoration of habitats and mitigation but with limited opportunities to offset the net loss of habitats.

7.10.14 It is preferable for biodiversity net benefit opportunities to be as close as possible to the Proposed Project. Potential sites are therefore being carefully considered to make further improvements to biodiversity. These include the area owned by National Grid around the current Garth SEC. Other areas are privately owned so are subject to landowner agreement and ongoing land management practices. However, these areas offer opportunities to improve habitat distinctiveness and condition and therefore to contribute towards a benefit for biodiversity.

7.10.15 A net benefit calculation, based upon the published DEFRA Biodiversity Metric 2.0 approach, is being prepared to help quantify biodiversity impacts and inform our enhancement strategy. If suitable sites cannot be secured within the immediate proximity of the Proposed Project or within the wider area, for land rights, third party access or other reasons, National Grid is committed to supporting suitable alternative ecological improvement works in agreement with Snowdonia National Park Authority.

7.10.16 The benefits of the Proposed Project in landscape, visual and environmental terms cannot be underestimated. The removal of 3.5km of existing high voltage OHL including 9 pylons will bring about other environmental gains. These benefits will be felt by the wider National Park, residents and visitors alike. National Grid is committed to delivering improvements in the most environmentally sensitive way and will work with stakeholders to ensure a net benefit for biodiversity at the same time.

Enhancement

7.10.17 Details for reinstatement of habitats temporarily lost to the Proposed Project are provided in embedded mitigation and the Landscape and Visual Impact Chapter. A summary of the proposed enhancements assumed in this appraisal is provided below (details are provided on Figure 2.2):

- Screening of the tunnel head house and SEC at Garth and Cilfor will include areas of tree and scrub planting. These will provide a visual screen, using species which are already found in the local area.
- A mixture of scrub and species rich grassland will be created in areas around Garth SEC.
- Erection of bat and bird boxes at locations to be agreed with the local planning authority on retained trees or on standalone structure at both the western and eastern compounds.
- Restoration and enhancement of valley mire as detailed below.

Valley Mire

7.10.18 Measures to mitigate the permanent and temporary loss of valley mire habitat are provided in the Outline Peat Management Plan and in the Outline Habitat Management Plan (Appendix 2A). In summary, additional mitigation measures for the restoration and revegetation of mire and peat will include:

- Areas of peat within the footprint of the Proposed Project will have the surface horizon (acrotelm) with vegetation stripped off as turves.
- Peat restoration will be undertaken in a number of areas including: on the excavated slopes around the compound; along the access road; and in areas identified for peat restoration (which may include ditches within the site or remote locations).
- Peat reinstatement will be undertaken to recreate the in situ peat stratigraphy.
- Peat will be restored to form a surface that interacts with the groundwater in a similar way to adjacent in situ peat (i.e. will not be significantly raised above adjacent surfaces)
- In locations identified for restoration peat will be built up in the correct sequence to reform the land surface. Recreated slopes will be 1:3 or less.
- Reinstatement of vegetation will be focused on natural regeneration utilising vegetated turves and the existing seed bank. In the event that the quantity of excavated vegetated acrotelm turves is not sufficient, a local provenance seed mix will be used.
- The requirement for additional compensation for the loss of valley mire habitat will be agreed with the consultees during the consultation process.

Protected Species - Badger

7.10.19 Due to the age of data at the time of construction starting, pre-construction walkovers for Badgers will be carried out to confirm the location of Badger setts. The requirement for licences to close setts will be reviewed following these surveys. Data for all other protected species surveys (carried out in 2016 and repeated in 2018) is to be considered valid and not to be repeated prior to construction.

7.10.20 Based on current known sett locations, all construction works (excluding OHL removal) will be able to allow a 30 m standoff from active badger setts. For OHL removal (or and new setts dug within 30 m of other construction activities), mitigation would be implemented to minimise disturbance. If it is necessary to exclude badgers from a sett, a licence would be required from NRW.

7.10.21 Open excavations will be fenced to prevent access by Badgers (and other protected species). A ramp will be installed in any excavations that are left open over night to enable any trapped animals to escape.

Habitats - Invasive plant species

7.10.22 Fencing will be designed and installed to prevent incursion of vehicles and personnel into areas infested with invasive plant species. Fencing will be left in place throughout the construction period. The Biosecurity Risk Assessment will be followed during construction and removal of OHL.

Protected Species - Bats

7.10.23 Measures will be specified to minimise noise during construction. These are detailed in Chapter 14 (Noise and Vibration). Noise levels will be monitored to ensure compliance with appropriate noise limits.

7.10.24 Where night time working is essential only the minimal level of night-time lighting for safety purposes would be implemented and these would be directed away from linear features that could be used by bats for navigation. The use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter. Bat boxes will be installed to increase the availability of roosting sites.

Protected Species – Breeding Birds

7.10.25 Habitats suitable for breeding birds will be removed outside of the breeding season (March to August inclusive). Any habitats that are to be removed during the breeding season will be checked by an ecologist immediately prior to removal. Bird boxes will be installed to compensate for the loss of breeding sites.

Protected Species – Reptiles

7.10.26 For large areas of loss of habitat suitable for reptiles, a translocation, using exclusion fencing, will take place to move reptiles (and any other species found e.g. Toads) away from the construction zone. Details for reptile mitigation, including translocation areas and proposed a receptor site, is provided in the Reptile Method Statement. Hibernacula will be constructed in retained habitat to provide an improvement in habitat quality for reptiles. The fence will remain in place throughout construction in these areas.

7.10.27 For small areas of loss of habitat suitable for reptiles, works will take place following a detailed method statement, including habitat manipulation, hand searching and exclusion fencing.

7.10.28 A Habitat Regulations Assessment (including a Stage 1 screening report and statement to inform an appropriate assessment report) has been produced to assess impacts on the Meirionnydd Oakwoods and Bat Sites SAC (Appendix 7C). The report will be provided to the competent authority for determination prior to construction. Mitigation provided in the HRA is also included in this appraisal.

7.10.29 With regard to potential direct or indirect impacts on lichens in the Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC, a Dust Risk Assessment has been prepared to ensure the appropriate level of mitigation is put in place. The Dust Risk Assessment forms an Appendix to the Outline CEMP (Appendix 2A). The Dust Risk Assessment commits to agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring and $PM_{2.5}$ monitoring locations with the Local Authority. The SAC will be included as one of the monitoring locations.

7.10.30 Assent and method statements for works in the Ysbyty Bron Y Garth SSSI and the discharge outfall into Glaslyn SSSI will be required for the construction of the project. These will require approval from Natural Resources Wales.

During Operation

7.10.31 Unless essential maintenance is required, night-time lighting during operation will be avoided in all ecologically sensitive areas i.e. the tunnel head house and SEC adjacent to Meirionnydd Oakwoods and Bat Sites SAC and Bron Y Garth SSSI. These dark areas will reduce the impact on bats allowing free bat movement foraging and roosting sites. Cowls will be fitted to lighting to assist in preventing light spill on to sensitive habitats.

7.10.32 Operational noise from ventilation fans close to the SAC could affect bat activity close to the tunnel head house. The impacts will be mitigated for using noise reduction methods outlined in the Chapter 14 (Noise and Vibration).

7.10.33 Monitoring of the restored and created habitats will take place during the operational period of the project. The monitoring will include botanical assessment to determine the success of mitigation in important habitats (such as valley mire) and whether restoration from turves or seed bank required any remedial measures.

During Decommissioning

7.10.34 Mitigation measures for impacts on ecological receptors as a result of decommissioning are likely to be similar to those identified for the construction phase detailed above.

7.10.35 A reassessment of ecological impacts and relevant mitigation measures will be required prior to decommissioning, taking account of any changes in ecological receptors, legislation and assessment guidance which are updated during the operational stage of the project.

7.10.36 A summary of the likely effects of the Proposed Project on Ecology during construction and during operation, as well as proposed mitigation, are provided in Table 7.4 and Table 7.5.

Table 7.4: Summary of potential effects and proposed embedded and additional mitigation during construction

Description of Potential Effects	Ecological Feature	Summary of Mitigation / Enhancement Measures
Pollution – noise, dust and lighting	Meirionnydd Oakwoods and Bat Sites SAC	Development and implementation of a CEMP to include measures to minimise dust, noise, littering, environmental incidents, lighting. Preparation of a Habitat Regulations Assessment. Monitoring of dust within the SAC as part of a Dust Risk Assessment.
Pollution – noise and lighting	Bron Y Garth SSSI (and Bron Y Garth WS)	Development and implementation of a CEMP to include measures to minimise dust, noise, littering, environmental incidents, lighting. Method Statements and an application for assent for works in the SSSI will be required.
Pollution – surface water discharge	Glaslyn SSSI (and Traeth Glaslyn NWWT site)	Development and implementation of a CEMP to include measures to minimise water flowing into the SSSI and reduce possible pollution within any water to be discharged. Method Statements and an application for assent for works in the SSSI will be required.
Loss of habitat	Semi-improved Grassland	Loss of semi-improved grassland during construction will be mitigated through reinstatement of this habitat once construction works are completed.
Loss of habitat (permanent)	Valley Mire	Direct loss of valley mire during construction and indirect loss of valley mire through altered hydrological regime. Mitigated through improvement of habitat quality in retained areas and retention and reuse of peat as detailed in the Outline Peat Management Plan.
Loss of habitat (temporary)		Temporary loss of valley mire during construction will be mitigated through reinstatement of this habitat once construction works are completed. An Outline Peat Management Plan has been prepared and will be adhered to by the contractor.
Habitat degradation	Broad Leaved Semi-Natural Woodland Habitat	Degradation of woodland canopy during OHL removal will be mitigated through the use of scaffolds where possible. Planting of screening habitat buffers around the development will provide compensatory habitat and continued connection/wildlife corridors with habitats on and off site. Any areas of woodland temporarily lost will be replanted as detailed in Chapter 6 (Landscape and Visual).

Description of Potential Effects	Ecological Feature	Summary of Mitigation / Enhancement Measures
Spread of Invasive Plant Species	Invasive Plant Species	Fencing to prevent access into areas infested with invasive plant species. Details of working around invasive species and prevention of spread are provided in the Biosecurity Risk Assessment (Appendix 2A)
Loss of habitat	Aquatic Habitat	Temporary loss of short sections of ditches where crossed by access tracks. These will be re-instated following completion of construction activities. Pollution prevention guidelines to be followed to reduce impacts on this habitat.
Changes in hydrology		Impacts on adjacent valley mire habitat through altered hydrological regime and potential for pollution events. Mitigation included in CEMP including pollution prevention guidelines. Details on the impacts on changes in hydrology are considered in the Outline Peat Management Plan and Chapter 9 (Water Resources and Flood Risk).. Increased retention of water is expected in the valley mire habitat which is likely to be of benefit to this habitat
Loss of habitat	Hedgerow	Working width to be reduced as much as possible. Hedgerow to be reinstated following construction.
Loss of roosting trees	Roosting Bat Species	Trees will be inspected during felling, where endoscope cannot be used tree will be felled in sections
		Installation of new roosting opportunities e.g bat boxes
Loss of commuting/foraging habitat	Commuting/ Foraging Bat Species	As detailed in Chapter 6 (Landscape and Visual) native tree and shrub planting is proposed to complement and enhance the local landscape and help to filter views of the permanent infrastructure. The new landscape planting will provide new wildlife/habitat corridors and opportunities for linkages between habitats.
Pollution – noise and lighting		The Outline CEMP provides details on avoiding/minimising lighting sensitive habitats during construction wherever possible, working hours, and the use of other forms of mitigation/technical specifications of lighting and noise reduction
Loss of foraging habitat (permanent)	Badger	The Outline CEMP includes details of preventing Badgers becoming trapped in open excavations. No mitigation is proposed for loss of foraging habitat.

Description of Potential Effects	Ecological Feature	Summary of Mitigation / Enhancement Measures
Loss of foraging habitat (temporary)		The Outline CEMP includes details of preventing Badgers becoming trapped in open excavations. Habitat restored following completion of works.
Displacement – noise and lighting		The Outline CEMP includes measures to minimise noise, littering, environmental incidents, lighting.
Loss of habitat (permanent - including Pylons)	Bird species	Any habitat suitable for nesting birds that requires clearance should be removed outside of the bird-breeding season (March to August inclusive).
		Mow or strim the habitat outside of the nesting bird season to 30 cm, to limit cover.
		Deter birds from breeding in the construction area, thereby encouraging them to utilise alternative breeding habitat in the wider local area. This will be achieved through the removal of suitable vegetation, or the installation of bird deterrents including tape and kites.
		Prior to plant moving onto site, the area will be walked over by an ecologist to search for any nests and nesting birds.
		A walkover by an ecologist will also be completed prior to compound set up etc., the topsoil should then be removed to deter birds from nesting during construction.
		Habitat retention and enhancement proposals (including screening planting and bird boxes), detailed in the Landscape and Visual Impact Chapter, will provide new nesting and foraging habitat for birds that will compensate for any bird nesting habitat lost
Loss of habitat (temporary)		Any habitat suitable for nesting birds that requires clearance should be removed outside of the bird-breeding season (March to August inclusive).
		Mow or strim the habitat outside of the nesting bird season to 30 cm, to limit cover.
		Deter birds from breeding in the construction area, thereby encouraging them to utilise alternative breeding habitat in the wider local area.

Description of Potential Effects	Ecological Feature	Summary of Mitigation / Enhancement Measures
		Prior to plant moving onto site, the area will be walked over by an ecologist to search for any nests and nesting birds.
		A walkover by an ecologist will also be completed prior to compound set up etc., the topsoil should then be removed to deter birds from nesting during construction.
		Habitat retention and enhancement proposals (including screening planting and bird boxes) will provide new nesting and foraging habitat for birds that will compensate for any bird nesting habitat lost.
Pollution – noise and lighting, dust, vibration		The Outline CEMP includes measures to minimise dust, noise and lighting.
Loss of habitat (temporary)	Reptile species	Mow or strim the habitat during reptile active season to 15 cm, to limit cover.
		Prior to plant moving onto site, the area will be walked over by an ecologist to search for any reptiles or any suitable refuges.
		Exclusion fencing will be installed to prevent access by reptiles to the construction zone.
Loss of habitat (permanent)		Reptile translocation (including exclusion fencing) will take place prior to development on areas of permanent habitat loss. Reptiles will be moved to an appropriate receptor area away from the development.
		Exclusion fencing will remain in place to prevent access by reptiles to the construction zone.
		Hibernacula will be created in receptor areas to improve habitat quality for reptiles.
Pollution – noise and lighting, dust, vibration	Otter	The Outline CEMP includes measures to minimise dust, noise and lighting.
Loss of habitat (permanent)	Toads	Mitigation measures for reptiles will benefit Toads and other

Description of Potential Effects	Ecological Feature	Summary of Mitigation / Enhancement Measures
		amphibian species.
Loss of habitat (temporary)		Mitigation measures for reptiles will benefit Toads and other amphibian species. Habitat reinstated following construction.

Table 7.5: Summary of potential effects and proposed embedded and additional mitigation during operation

Description of Potential Effects	Ecological Features	Summary of Mitigation / Enhancement Measures
Pollution – lighting and noise	Meirionnydd Oakwoods and Bat Sites SAC	During operation it is anticipated that lighting will only be required during maintenance (which is short term and infrequent). Noise mitigation (as detailed in Chapter 14 Noise and Vibration) will be implemented to reduce impacts from operational noise on the species using the SAC.
Pollution – lighting and noise	Bron Y Garth SSSI	During operation it is anticipated that lighting will only be required during maintenance (which is short term and infrequent). Noise mitigation (as detailed in Chapter 14 Noise and Vibration) will be implemented to reduce impacts from operational noise on the species using the SSSI.
Habitat degradation	Valley Mire	Mitigation will be implemented in accordance with the Outline Peat Management Plan. This will include retention of water within the mire habitat to prevent drying out and improvement of mire habitat within and adjacent to the construction areas through re-use of peat.
Pollution – lighting and noise	Commuting/ Foraging Bat Species	During operation it is anticipated that lighting will only be required during maintenance (which is short term and infrequent). Noise mitigation (as detailed in Chapter 14 Noise and Vibration) will be implemented to reduce impacts from operational noise on bats commuting and foraging close to the tunnel head houses.

7.11 Cumulative Effects

7.11.1 As detailed in Chapter 18 (Cumulative Impacts) no cumulative developments have been identified. This ecology chapter has considered impacts on ecological receptors from noise, accidental pollution, lighting and dust and hence has considered interactions between these factors and the ecological receptors.