



Galileo 03 Ltd

Mynydd Ty-talwyn Energy Park - Environmental Statement Volume II

Main Written Statement – Chapters 1 to 4

Project Reference: 663870

This chapter is summarised within the Non-Technical Summary of this Environmental Statement. A Welsh translation of the Non-Technical Summary is also available as part of the application.

Crynoir y bennod hon yng Nghrynodeb Annhechnegol y Datganiad Amgylcheddol hwn. Mae cyfieithiad Cymraeg o'r Crynodeb Annhechnegol hefyd ar gael fel rhan o'r cais.

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RSK

RSK GENERAL NOTES

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Galileo 03 Ltd.

Mynydd Ty-talwyn Energy Park - Environmental Statement Volume II

PREFACE

Galileo 03 Ltd (the 'Applicant') is proposing to develop Mynydd Ty-talwyn Energy Park (the 'Proposed Development') which would be located north of Bridgend.

The Proposed Development comprises the construction, operation and decommissioning of up to six wind turbines, ground mounted solar photovoltaics (PV), a project substation compound and associated infrastructure and landscaping.

RSK Environment Limited has been commissioned by the Applicant to undertake an Environmental Impact Assessment (EIA) of the Proposed Development. This Environmental Statement (ES) reports the findings of environmental assessments undertaken for the Proposed Development.

The ES is presented in four volumes:

- Volume I – Non-Technical Summary;
- Volume II – Main Written Statement;
- Volume III – Supporting Technical Appendices; and
- Volume IV – Supporting Figures and Plans.

A copy of the ES is available at the Planning and Environment Decision Wales (PEDW) website <https://www.gov.wales/planning-and-environment-decisions-wales> using reference: DNS CAS-03018-G7G6H7 as well as the Bridgend County Borough Council and Neath Port Talbot Council planning portals. The ES is also available to view on the Applicant's project website: <https://mttenergypark.co.uk/en/>

Hard copies of the ES are also available to view at both Bridgend County Borough Council and Neath Port Talbot Council offices.

Paper copies of the ES can be obtained upon written request to the Applicant by email to MTT@galileoempower.uk. In accordance with regulation 22 of The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017, each copy would be subject to a charge to reflect printing and distribution costs. It is anticipated that this charge will be approximately £500. In the interests of sustainability, a paperless version is recommended and the ES can also be made available in PDF file format on a USB memory stick at a cost of £15.

EIA Quality Mark

This Environmental Statement, and the Environmental Impact Assessment (EIA) carried out to identify the significant environmental effects of the Proposed Development, has been undertaken in line with the EIA Quality Mark Commitments.



The EIA Quality Mark is a voluntary scheme, operated by the Institute of Sustainability and Environmental Professionals (ISEP) (formerly the Institute of Environmental Management and Assessment), through which EIA activity is independently reviewed, on an annual basis, to ensure it delivers excellence in the following areas:

- EIA management
- EIA team capabilities
- EIA regulatory compliance
- EIA context & influence
- EIA content
- EIA presentation
- Improving EIA practice

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GLOSSARY

Abnormal Indivisible Load	Any load which cannot be broken down into smaller loads for the purposes of transportation, without undue expense or risk of damage.
Air quality standard	Concentration of a pollutant, over a specified period, above which adverse effects on health and/or the environment may occur, and which should not be exceeded.
Alternatives	Different design, layout and technological possibilities that could be considered during project development that have potential to fulfil the project objectives.
Ambient	Of or relating to the immediate surroundings of something (e.g. ambient noise level).
Ancient woodland	Woodland that has existed continuously since at least AD 1600.
Annex I project	See 'Schedule 1 project'.
Annex II project	See 'Schedule 2 project'.
Appropriate assessment	Process whereby projects, either alone or in combination, are considered to see if it can be ascertained that they will not adversely affect the integrity of a European protected site.
Archaeological interest	There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.
Assessment	Process by which information about effects of a proposed plan, project or intervention is collected, assessed and used to inform decision making.
Baseline conditions	Environment as it appears (or would appear) immediately prior to the implementation of the project together with any known or foreseeable future changes that will take place before completion of the project.
Baseline studies	Work done to determine and describe the environmental conditions against which any future changes can be measured or predicted and assessed.
Best Available Techniques	The available techniques which are the best for preventing or minimising emissions and impacts on the environment.
Biodiversity	The biological diversity of the earth's living resources. The total range of variability among systems and organisms at the following levels of organisation: bioregional, landscape, ecosystem, habitats, communities, species, populations, individuals, genes, and the structural and functional relationships within and between these different levels.
Catchment	Drainage/basin area within which precipitation drains into a river system and eventually into the sea.

Climate change	Large scale, long term shift in the Earth's weather patterns or average temperature.
Combined effects	The interaction and combination of different residual (post-mitigation) environmental effects of the Proposed Development affecting the same Receptor. For example, visual and noise effects during construction affecting the same residential dwelling.
Competent authority	Authority responsible for determining the application for consent, permission, licence or other authorisation to proceed with a development.
Construction Environmental Management Plan	Document setting out methods to avoid, minimise and mitigate Impact on the environment and surrounding area and the protocols to be followed in implementing these measures in accordance with environmental commitments during the construction phase.
Construction phase	Period during which the building or assembling of a proposed development and its infrastructure is undertaken.
Consultation	Process by which those organisations or individuals with an interest in the area associated with the Proposed Development are identified and engaged as part of the EIA process.
Consultation bodies	Organisations that the competent authority is required to consult by virtue of the EIA Regulations.
Controlled waters	Surface waters, ground waters and coastal waters to which UK pollution legislation applies.
Culvert	Pipe or box-type conduit through which water is carried under a structure.
Decommissioning	Period during which a development and its associated infrastructure are removed from active operation.
Design event	Event such as a rainstorm or flood of given magnitude and probability (usually derived from previous records).
Development of National Significance	A development of national significance (DNS) is a type of planning application for a large infrastructure project in Wales.
Discharge consent	Statutory document issued by Natural Resources Wales setting limits and conditions on the discharge of an effluent into controlled waters.
Do-nothing scenario	Also known as the 'do-minimum' scenario: the conditions that would persist in the absence of the implementation of a development.
Effect	Term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact with the importance (or sensitivity) of the receptor or resource in accordance with defined significance criteria. For example, land clearing during construction results in habitat loss (impact), the effect of which is the significance of the habitat loss on the ecological resource.

Emission standard	Maximum amount or concentration of a pollutant allowed to be emitted from a particular source.
Emissions inventory	Collection of data relating to the characteristics of processes or activities that release pollutants into the atmosphere.
Enhancement	Measure that is over and above what is required to mitigate the adverse effects of a project.
Environmental assessment	Method and a process by which information about environmental effects is collected, assessed and used to inform decision-making. Assessment processes include strategic environmental assessment, assessment of implications on European sites, and environmental impact assessment.
Environmental Impact Assessment	A systematic means of assessing the significance of effects from the Proposed Development, undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (EIA Regulations).
Environmental information	Information that must be taken into account by the decision maker (the competent authority) before granting authorisation in any case where the EIA process applies. It includes the environmental statement, including any further information, any representations made by any body required by the Regulations to be invited to make representations, and any representations duly made by any other person about the environmental effects of the development.
Environmental Management Plan	Structured plan that outlines the mitigation, monitoring and management requirements arising from an environmental impact assessment.
Environmental Statement	A statement prepared in accordance with the EIA Regulations that includes the information that is reasonably required to assess the likely effects of a development and which the Applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile.
European site	An area of land subject to protection through European legislation, including Special Area of Conservation (SAC) and Special Protection Area (SPA).
Evaluation	Determination of the significance of effects. Evaluation involves making judgements as to the value of the receptor/resource that is being affected and the consequences of the effect on the receptor/resource based on the magnitude of the impact.
Geographical Information System	A system that captures, stores, analyses, manages, and presents data linked to location. It links spatial information to a digital database.
Greenhouse Gases	Gases that absorb and emit reflected solar radiation which result in the warming of the Earth's atmosphere. It is absorbed and emitted at specific wavelengths within the spectrum of infrared radiation emitted by the earth's surface, the atmosphere, and clouds. The six main Greenhouse Gases (GHGs) whose emissions are human caused are: carbon

	dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbon, and sulphur hexafluoride. In combination, these GHG emissions are commonly expressed in terms of 'carbon dioxide equivalents' (CO ₂ e) according to their relative global warming potential. For this reason, the shorthand 'carbon' may be used to refer to GHGs.
Ground Investigation	The physical investigation stage of the Geotechnical Survey of which Geophysical Surveys may be one element. Comprised of targeted investigations including both intrusive and non-intrusive techniques to prove ground conditions, determine soil/rock parameters and identify hazards associated with the ground conditions to inform a proposed development.
Groundwater	Groundwater is the store of water present beneath Earth's surface in rock and soil pore spaces and in the fractures of rock formations.
Groundwater Dependent Terrestrial Ecosystems	Wetlands such as springs, flushes and fens which are fed by groundwater rather than rainfall or surface runoff. They are particularly sensitive to hydrological and ecological changes caused by development.
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 (as amended) which covers the terrestrial environment.
Habitats Regulations Assessment	A Habitats Regulations Assessment (HRA) refers to the stages of assessment carried out by the competent authority in accordance with Habitats Regulations and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) to determine if a project may affect the protected features of a European site and European offshore marine site, before deciding whether to undertake, permit or authorise it.
Hydraulics	Processes and regimes of water flow (velocities, volumes, duration, frequency etc) in hydrological systems such as surface waters and groundwater.
Hydrodynamics	Mechanical properties of fluids.
Impact	Change that is caused by an action; for example, land clearing (action) during construction that results in habitat loss (impact).
Inter-project cumulative effects	The combined residual (post-mitigation) effects of the Proposed Development and other developments (referred to as 'other developments') on a single receptor/resource.
Intra-project combined effects	The interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor.
Invertebrates	Animals without backbones.
Land drainage	The disposal of rainwater, achieved by a combination of watercourses of various types.

Land Use	The purpose for which land is used, based on broad categories of functional land cover, such as urban and infrastructure use and the different types of agricultural and forestry.
Landform	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation, and physical processes.
Likely Significant Effect	The significance of an environmental effect is typically a function of the 'value' or 'sensitivity' of the Receptor and the 'magnitude' or 'scale' of the Impact. Combining the environmental value of the resource or receptor with the magnitude of change produces a significance of effect category. The definition of a significant effect for each environmental topic will be contained within their respective chapters of the Environmental Statement.
Local Development Plan	The set of documents and plans that sets out the Local Planning Authority's policies and proposals for the development and use of land in their area.
Mean (high/low) water	Highest/lowest average level water reaches during a tidal cycle.
Method statement	Document that sets out intended working or survey practices.
Mitigation	Measures intended to avoid, reduce or compensate for adverse environmental effects.
Monitoring	Continuing assessment of the performance of the project, including mitigation measures. This determines if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted.
Non-statutory consultee	Organisations and bodies that may be consulted on relevant planning applications.
Non-Technical Summary	Information for the non-specialist reader to enable them to understand the main predicted environmental effects of the proposal without reference to the main Environmental Statement.
Operation	Functioning of a development on completion of construction.
Pasture	Grassland maintained primarily for and by grazing, and on which grazing stock is kept for a large part of the year.
Phase 1 habitat survey	Recognised methodology used for collating information on the habitat structure of a particular site.
Photomontage	Superimposing of an image onto a photograph to create a realistic representation of proposed or potential changes to a view.
Piling	Installation of bored and driven piles into the ground.
Planning and Environment Decisions Wales	Body responsible for managing casework with regard to Developments of National Significance..

Pollution	Any increase of matter or energy to a level that is harmful to living organisms of their environment (when it becomes a pollutant).
Preferred option	Chosen design option that most successfully achieves the project objectives and becomes subject to further design and assessment.
Principal Contractor	A company or individual appointed by the Applicant to plan, manage, and monitor the construction phase of the Proposed Development.
Programme	Series of steps that have been identified by the Applicant, or series of projects that are linked by dependency.
Project Team	Specialist technical consultant and advisors to deliver the Proposed Development
Proposed Development	The development for which planning permission is sought. In this instance, this includes: • Up to Six wind turbines (anticipated generating capacity of approximately 43 MWac subject to final turbine selection), each up to 200 m in height to blade tip, associated infrastructure including access tracks, crane pad hardstandings, foundations, cabling, and laydown/storage areas and a 50 m micro-siting allowance for the turbines and ancillary infrastructure; • Solar PV modules (anticipated generating capacity of approximately 50.5 MWac subject to final PV selection) and associated infrastructure including inverters, transformers, associated mounting structures, fencing, CCTV, cabling and access tracks; • An on-site electrical 33 kV/132 kV substation to connect the solar PV modules, and wind turbines to the electricity network, including transformers, switchgear, busbars, control equipment buildings including an office, control functions, material storage, firewalls, cabling, as well as wider monitoring and maintenance equipment; • On-site underground electrical cables linking the wind turbines, solar PV and the on-site substation, generally laid in trenches alongside access tracks where possible; • Site Access from the northeast (A4063) and south (New Road). Total wind track length is approximately 11.5 km, including approximately 7.9 km new tracks and approximately 3.6 km upgrades to existing tracks, with vehicle turning heads and passing places as required as well as localised overrun areas to the Ffordd-Y-Gyfraith highway; • A permissive footpath is proposed along part of the on-site access tracks to improve access, particularly during wetter months; • Watercourse crossing and associated infrastructure; • Landscaping and biodiversity enhancements; and • Drainage infrastructure.

Ramsar	Areas designated by the UK Government under the International Ramsar Convention (the Convention on Wetlands of International Importance).
Receptor	Defined individual environmental feature usually associated with population, fauna and flora with the potential to be affected by a project.
Residual Effect	Effects arising from the Proposed Development that cannot be mitigated following implementation of Mitigation measures.
Resource	Defined but generally collective environmental feature usually associated with soil, water, air, climatic factors, landscape, material assets, including the architectural and archaeological heritage that has potential to be affected by a project.
Roosting site (birds)	Place where birds rest or sleep.
Roosting site (bats)	Place where bats live (e.g. built structures and trees).
Run-off	Precipitation that flows as surface water from a site, catchment or region to the sea.
Schedule 1 project	Plans or projects listed in Annex I of the EIA Directive and Schedule 1 of the EIA Regulations.
Schedule 2 project	Plans or projects listed in Annex II of the EIA Directive and Schedule 2 of the EIA Regulations.
Scoping	Process of identifying the issues to be addressed by the environmental impact assessment process. It is a method of ensuring that an assessment focuses on the important issues and avoids those that are considered not significant.
Scoping Direction	Opinion provided by a competent authority that indicates the issues an environmental impact assessment of a proposed development should consider.
Screening	Formal process undertaken to determine whether it is necessary to carry out a statutory environmental impact assessment and publish an Environmental Statement in accordance with the EIA Regulations.
Sediment	Organic and inorganic material that has precipitated from water to accumulate on the floor of a water body, watercourse or trap.
Semi-natural	Habitat, ecosystem, community, vegetation type or landscape that has been modified by human activity but consists largely of native species and appears to have similar structure and functioning to a natural type.
Significance of effect	Measure of the importance of the environmental effect, defined by either generic significance criteria or criteria specific to the environmental topic.
Special Area of Conservation	Areas of protected habitats and species as defined in the Habitats Directive.
Special Protection Area	Sites classified in accordance with Article 4 of the EC Birds Directive (79/409/EEC) which came into force in April 1979. They are classified for rare and vulnerable birds (as listed on

	Annex 1 of the Directive), and for regularly occurring migratory Species.
Stakeholder	Organisation or individual with a particular interest in the project.
Source Protection Zone	Areas which show the level of risk to the source of groundwater from contamination. Source Protection Zone (SPZ) 1 (Inner zone) is based on a 50 day travel time of pollutant to source with a 50 metres default minimum radius. SPZ2 (outer zone) is based on a 400 day travel time of pollutant to source with 250 or 500 metres minimum radius around the source depending on the amount of water abstracted. SPZ 3 (total catchment) area around a source within which all the groundwater ends up at the abstraction point.
Statutory consultee	Organisations that the competent authority is required to consult by virtue of the EIA Regulations.
Study area	Spatial area within which environmental effects are assessed (i.e. extending a distance from the project footprint in which significant environmental effects are anticipated to occur). This may vary between the topic areas.
Threshold	Specified level in grading effects (e.g. the order of significance).
Visual amenity	Value of a particular view or area in terms of what is seen.
Wildlife corridor	Linear habitats/landscape features such as hedgerows that may increase connectivity by acting as routes between habitat patches.
Worst case	Principle applied where environmental effects may vary (e.g. owing to seasonal variations) to ensure the most severe effect is assessed.

ACRONYMS

AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
AERMOD	An atmospheric dispersion model
AIA	Arboricultural Impact Assessment
AIL	Abnormal Indivisible Load
ALARP	As Low As Reasonably Practicable
ALC	Agricultural Land Classification
ALTMP	Abnormal Load Transport Management Plan
AM	Amplitude Modulation
ANO	Air Navigation Order
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
ATC	Automatic Traffic Counters
BAP	Biodiversity Action Plan
BAT	Best Available Techniques
BCBC	Bridgend County Borough Council
BESS	Battery Energy Storage System
bgl	Below Ground Level
BGS	British Geological Survey
BHH	Britain's Hidden History
BMV	Best and Most Versatile
BNL	Basic Noise Level
BOAT	Byway Open to All Traffic
BoCC	Birds of Conservation Concern
BPM	Best Practicable Means
BS	British Standard
CA	Competent Authority
CAA	Civil Aviation Authority
CD	Chart Datum
cd	Candela
CEMP	Construction Environmental Management Plan

CIEEM	Chartered Institute of Ecology and Environmental Management
Cifa	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research And Information Centre
CITB	Construction Industry Training Board
CIEEM	Chartered Institute of Ecology and Environmental Management
CIWEM	Chartered Institute of Water and Environmental Management
CLEA	Contaminated Land Exposure Level
CMRA	Coal Mining Risk Assessment
CO ₂	Carbon Dioxide
COMAH	Control of Major Accident Hazards
CoPA	Control of Pollution Act
COSHH	Control of Substances Hazardous To Health
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
DAM	Development Advice Map
DARE	Decarbonisation and Renewable Energy
dB(A)	Decibel (A-Weighted), A Unit Of Noise Measurement
DBA	Desk-Based Assessment
DC	Direct Current
DCWW	Dŵr Cymru Welsh Water
DEMP	Decommissioning Environmental Management Plan
DfT	Department For Transport
DIO	Defence Infrastructure Organisation
DMMO	Definitive Map Modification Order
DMRB	Design Manual For Roads And Bridges
DNO	District Network Operator
DNS	Development Of National Significance
EA	Environment Agency
EC	European Commission
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk Of Works
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EPS	European Protected Species

EQS	Environmental Quality Standards
ES	Environmental Statement
ESDAL	Electronic Service Delivery For Abnormal Loads
EU	European Union
EUETS	European Union Emissions Trading Scheme
FCA	Flood Consequences Assessment
F & I	Fear & Intimidation
FRAP	Flood Risk Activity Permit
FTE	Full Time Equivalent
GGAT	Glamorgan Gwent Archaeological Trust
GHG	Greenhouse Gas
GIS	Geographic Information System
GPG	Good Practice Guide
GPS	Global Positioning System
GVA	Gross Value Added
ha	Hectares
HDV	Heavy Duty Vehicle
HER	Heritage Environment Record
HEWA	Historic Environment (Wales) Act
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment / Heritage Impact Assessment
HRA	Habitats Regulations Assessment
HSC	Hazardous Substance Consent
HSE	Health and Safety Executive
HV	High Voltage
HVAC	Heating, Ventilation and Air Conditioning
Hz	Hertz
ISEP	Institute of Sustainability and Environmental Professionals
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non-Native Species
IoA	Institute of Acoustics
IPPC	Integrated Pollution Prevention And Control
IR	Infra-Red
IROPI	Imperative Reasons of Overriding Public Interest
IUCN	International Union For Conservation Nature

JNCC	Joint Nature Conservation Committee
km	Kilometre
kV	Kilovolts
LCA	Landscape Character Area
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LCRM	Land Contamination Risk Management
LDP	Local Development Plan
LFN	Low Frequency Noise
LGS	Local Geological Sites
LGV	Light Goods Vehicle
LI	Landscape Institute
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserves
LPA	Local Planning Authority
LQAS	Land Quality Advice Service
LTP	Local Transport Plan
LUP	Land Use Planning
LVIA	Landscape and Visual Impact Assessment
MOD	Ministry Of Defence
MP	Measurement Position
MBBS	Moorland Breeding Bird Surveys
MMP	Materials Management Plan
MTC	Manual Turning Counts
MW	Megawatt
NCA	National Character Area
NCN	National Cycle Network
NGED	National Grid Electricity Distribution
NMR	National Monuments Record
NNR	National Nature Reserve
NO _x	Oxides of Nitrogen
NPT	Neath Port Talbot
NPTC	Neath Port Talbot Council
NRW	Natural Resources Wales
NSR	Noise Sensitive Receptor

NTS	Non-Technical Summary
NVC	National Vegetation Classification
OCEMP	Outline Construction Environmental Management Plan
OHLs	Overhead Lines
OS	Ordnance Survey
PAC	Pre-Application Consultation
PAH	Polycyclic Aromatic Hydrocarbons
PCS	Power Conversion System
PINS	Planning Inspectorate
PoE	Port of Entry
PEDW	Planning And Environment Decisions Wales
PM ₁₀	Particulate Matter (With An Aerodynamic Diameter Below 10 µm)
PPA	Planning Performance Agreement
PPC	Pollution Prevention And Control
PPV	Peak Particle Velocity
PPW	Planning Policy Wales
PRA	Preliminary Risk Assessment
PRoW	Public Right Of Way
PV	Photovoltaic
PWMS	Precautionary Working Method Statement
RCAHMW	Royal Commission On The Ancient And Historical Monuments Of Wales
RCS	River Corridor Survey
RHS	River Habitat Survey
RICS	Royal Institute of Chartered Surveyors
RIGS	Regionally Important Geological and Geomorphological Site
RPG	Regional Planning Guidance
RSPB	Royal Society for the Protection of Birds
SABs	Suds Approving Bodies
SAC	Special Area of Conservation
SCADA	Supervisory Control and Data Acquisition
SDP	Strategic Development Plan
SINC	Site of Importance for Nature Conservation
SLA	Special Landscape Area
SM	Scheduled Monument

SPA	Special Protection Area
SPD	Supplementary Planning Documents
SPZ	Source Protection Zone
SI	Site Investigation
SINC	Site of Importance For Nature Conservation
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
SWMP	Site Waste Management Plan
SWTRA	South Wales Trunk Road Agent
SZTV	Screened Zone Of Theoretical Visibility
TA	Transport Assessment
TAN	Technical Advice Note
TCPA	Town And Country Planning Act
TIA	Traffic Impact Assessment
TMP	Traffic Management Plan
TPO	Tree Preservation Order
TTRO	Temporary Traffic Regulation Order
UHF	Ultra High Frequency
UK	United Kingdom
VEC	Valued Ecological Component
VER	Valued Ecological Receptor
VP	Vantage Points
WCA	Wildlife And Countryside Act
WEBS	Wetland Bird Survey
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

1 INTRODUCTION

1.1 Background Context and Introduction to the Proposed Development

- 1.1.1 Galileo 03 Ltd (hereafter 'the Applicant') is seeking to obtain full planning permission for the construction, operation and decommissioning of the Mynydd Ty-talwyn Energy Park (hereafter referred to as the 'Proposed Development'), located north of Bridgend, south Wales within the administrative boundaries of Bridgend County Borough Council (BCBC) and Neath Port Talbot Council (NPTC).
- 1.1.2 The Proposed Development comprises the construction and operation of up to six wind turbines, ground mounted solar photovoltaic (PV) modules, one project substation and ancillary infrastructure works.
- 1.1.3 This Environmental Statement (ES) presents an assessment of the likely significant environmental effects of the Proposed Development and the measures envisaged to avoid, prevent and reduce such effects. The ES has been prepared in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations 2017') and forms part of a suite of documents prepared to accompany the Development of National Significance (DNS) application.
- 1.1.4 The location of the Proposed Development is identified in **ES Volume IV, Figure 1.1: Site Context Plan** and is described further in **ES Volume II, Chapter 2: Proposed Development Description**.
- 1.1.5 The DNS application boundary is presented in **ES Volume IV, Figure 1.2: Planning Application Boundary** the area which it encompasses is hereafter referred to as 'the Site'. Further details on the Site and the Proposed Development are described in **ES Volume II, Chapter 2: Proposed Development Description**.

Planning Context

- 1.1.6 The Town and Country Planning Act 1990 (as amended by the Planning (Wales) Act 2015) and the Developments of National Significance (Procedure) (Wales) Order 2016 and associated regulations and orders, provides the statutory basis for the DNS regime. Any proposal to construct a generating station with a capacity between 10 megawatts (MW) and 350 MW falls under the DNS system and requires Welsh Ministers' consent. For onshore wind there is no 350 MW upper limit, however, the Proposed Development is under 350 MW in any event.
- 1.1.7 The Proposed Development is classed as a DNS as it will be a generating station (comprising onshore wind and solar) with an installed generating capacity above 10 MW and below 350 MW. The Applicant is therefore seeking to secure full planning permission for the Proposed Development by way of an application made pursuant to section 62D of the Town and Country Planning Act 1990 and subsequent regulations.

Environmental Impact Assessment Context

- 1.1.8 The term 'Environmental Impact Assessment' (EIA) describes a procedure that must be followed for certain types of developments before they can be given 'consent', also known as 'planning permission'. The procedure is a means of drawing together, in a systematic way, an assessment of a development's likely significant environmental effects. This helps to ensure that the importance of the predicted effects, and the scope for reducing them, are properly understood by the public and the relevant competent authority before it makes its decision.
- 1.1.9 According to Welsh Parliament Senedd Research The Planning Series 10 – Environmental Impact Assessment:
- 'An Environmental Impact Assessment (EIA) is a procedure that ensures environmental implications are taken into account before planning decisions are made. An EIA assesses the possible positive and negative impact a proposed project may have on the environment. This information is submitted to the local planning authority or the Welsh Government in the form of an Environmental Statement (ES) to be considered alongside a planning application. An ES must contain a non-technical summary.'*
- 1.1.10 In accordance with the EIA Regulations 2017, an application submitted for an EIA Development, known as an 'EIA application', must be accompanied by an ES, which is the written output of the EIA process.
- 1.1.11 The Proposed Development is 'EIA Development' pursuant to Regulation 2 of the EIA Regulations 2017. This ES is one of the supporting documents submitted to the determining planning authority, in this case, the Planning and Environment Decisions Wales (PEDW) (on behalf of Welsh Ministers).
- 1.1.12 RSK has been commissioned by the Applicant to carry out the EIA in support of the DNS application and act as lead author of this ES. Alongside RSK, the ES has incorporated technical input from a number of experts, as outlined in **Section 1.3**.
- 1.1.13 The following sections outline the legal framework and structure of the ES and supporting documents. A breakdown of the information required by the EIA Regulations 2017 is provided in **Table 1.1** alongside the location of where this information is provided within this ES.

1.2 Legal Framework for the Environmental Statement

- 1.2.1 The EIA Regulations 2017 set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require an assessment if they give rise to likely significant environmental effects (Schedule 2 development).

EIA Screening

1.2.2 The Proposed Development falls under Schedule 2, Category 3(a) '*industrial installations for the production of electricity, steam and hot water (unless included in Schedule 1)*' and Category 3(i) '*installations for the harnessing of wind power for energy production (wind farms)*' of the EIA Regulations 2017, whereby any development area which exceeds 0.5 ha (Category 3(a)), or development which involves the installation of more than two turbines or a hub height of 15 m (Category 3(i)) may require an EIA depending on the characteristics of the development, the location of the development and the types and characteristics of the potential impact. Schedule 3 of the EIA Regulations 2017 outlines the criteria that should be applied when determining whether a Schedule 2 development requires EIA. The Schedule 3 criteria are summarised as follows:

- The characteristics of the Proposed Development (e.g., its size, cumulation with other developments, use of natural resources, production of waste, pollution and nuisances and the risk of accidents, and risks to human health);
- The environmental sensitivities of the geographical area (e.g., its existing and approved land use, the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground and the absorption capacity of the natural environment); and
- The characteristics of the potential impact, specifically the likely significant effects of the development taking into account:
 - The magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
 - The nature of the impact;
 - The transboundary nature of the impact;
 - The intensity and complexity of the impact;
 - The probability of the impact;
 - The expected onset, duration, frequency and reversibility of the impact;
 - The cumulation of the impact with the impact of other development(s); and
 - The possibility of effectively reducing the impact.

1.2.3 The Applicant recognises that the Proposed Development is likely to give rise to significant environmental effects. As such, the Applicant has decided to voluntarily undertake an EIA, in accordance with Part 2, Regulation 5(2)(a) of the EIA Regulations 2017. Consequently, a formal request for a Screening Direction has not been made to PEDW.

EIA Scoping

1.2.4 An EIA Scoping Report was submitted to PEDW on 27 November 2023, as presented in **ES Volume III, Appendix 1.1: EIA Scoping Report** together with a formal request for an EIA Scoping Direction, in accordance with Regulation 33(1) of the EIA Regulations 2017.

- 1.2.5 A formal Scoping Direction was subsequently received from PEDW on 11 April 2024, as presented in **ES Volume III, Appendix 1.2: Scoping Direction**. Further details on the Scoping Direction and how it has informed this ES are provided in **ES Volume II, Chapter 4: Approach to the EIA**.

Environmental Statement

- 1.2.6 The ES comprises four parts:
- Volume I: Non-Technical Summary;
 - Volume II: Main Written Statement;
 - Volume III: Supporting Technical Appendices; and
 - Volume IV: Supporting Figures and Plans.
- 1.2.7 Schedule 4 of the EIA Regulations 2017 provides details of the information required for inclusion in an ES. **Table 1.1** summarises the requirements and where the information is located in this ES.

Table 1.1 Specified Information within Schedule 4 of the EIA Regulations 2017

Para.	Required information	Location within this ES
1	Description of the development, including in particular:	
	(a) a description of the location of the development	ES Volume II, Chapter 2: Proposed Development Description
	(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases	ES Volume II, Chapter 2: Proposed Development Description
	(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used	ES Volume II, Chapter 2: Proposed Development Description
	(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operational phases)	ES Volume II, Chapter 4: Approach to the EIA ES Volume II, Chapters 5 to 14
2	A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the	ES Volume II, Chapter 3: Environmental Context and

Para.	Required information	Location within this ES
	proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects	Reasonable Alternatives Considered
3	A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge	ES Volume II, Chapter 2: Proposed Development Description ES Volume II, Chapter 4: Approach to the EIA ES Volume II, Chapters 5 to 14
4	A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape	ES Volume II, Chapters 5 to 14
5	A description of the likely significant effects of the development on the environment resulting from, inter alia:	-
	(a) the construction and existence of the development, including, where relevant, demolition works;	ES Volume II, Chapters 5 to 14
	(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;	ES Volume II, Chapters 5, 6, 8, 10 and 11
	(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;	ES Volume II, Chapter 2: Proposed Development Description ES Volume II, Chapter 9: Noise and Vibration ES Volume III, Appendix 4.3: Air Quality Assessment

Para.	Required information	Location within this ES
	(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);	ES Volume II, Chapter 2: Proposed Development Description ES Volume II, Chapter 7: Cultural Heritage
	(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;	ES Volume II, Chapters 5 to 14
	(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;	ES Volume II, Chapter 14: Climate
	(g) the technologies and the substances used.	ES Volume II, Chapter 2: Proposed Development Description
6	A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved	ES Volume II, Chapters 5 to 14
7	A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases	ES Volume II, Chapters 5 to 14
8	A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such	ES Volume II, Chapter 2: Proposed Development Description ES Volume II, Chapter 4: Approach to the EIA

Para.	Required information	Location within this ES
	as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies	
9	A non-technical summary of the information provided under paragraphs 1 to 8	ES Volume I, Non-Technical Summary
10	A reference list detailing the sources used for the descriptions and assessments included in the Environmental Statement	ES Volume II, Chapters 1 to 14

1.3 The Project Team and Statement of Competency

- 1.3.1 In accordance with Regulation 17(4)(a) and (b) of the EIA Regulations 2017, the ES and technical assessments which inform it have been undertaken by a suitably qualified project team with sufficient expertise to ensure completeness and quality.
- 1.3.2 RSK is responsible for the coordination, compilation and procedural review of the ES. RSK is registered under the EIA Quality Mark operated by the Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment) (IEMA)) which recognises our commitment to excellence in EIA activities. We have continued to maintain our EIA Quality Mark registration, following annual examination by ISEP in relation to our ongoing products, staff, innovation and promotion of EIA within the industry. RSK has and continues to support and lead nationally recognised guidance for EIA in the UK.
- 1.3.3 The companies involved in the preparation of this ES are listed in **Table 1.2** Competent expert statements for individuals who have authored an ES chapter or a technical appendix of this ES are provided in **ES Volume III, Appendix 1.3: Statement of Competence**. These statements present the project teams roles, relevant expertise and qualifications.

Table 1.2 The Project Team

Role	Company
Project management	Stephenson Halliday (<i>RSK Group company</i>)
EIA Coordinator	RSK Environment (<i>RSK Group company</i>)
Planning consultant	Stephenson Halliday (<i>RSK Group company</i>)

Role	Company
Lead designer – turbines, internal tracks roads	Pell Frischmann & Kiloh Associates
Lead designer – solar	Helioworks
Air quality consultant	RSK Air Quality (<i>RSK Group company</i>)
Climate consultant	Nature Positive (<i>RSK Group company</i>)
Cultural heritage consultant	Pegasus
Land, soil and groundwater consultant	RSK Geosciences (<i>RSK Group company</i>)
Peat consultant	Fluid Environmental Consulting
Landscape and visual consultant	Pegasus
Noise and vibration consultant	RSK Acoustics (<i>a RSK Group company</i>)
Ornithology consultant	RSK Biocensus (<i>a RSK Group company</i>)
Terrestrial ecology consultant	RSK Biocensus (<i>a RSK Group company</i>)
Traffic and transport consultant	SCP (<i>a RSK Group company</i>)
Shadow flicker, glint and glare and telecommunications consultant	Pager Power
Aviation consultant	Wind Power Aviation Consultants (WPAC) Ltd

2 PROPOSED DEVELOPMENT DESCRIPTION

2.1 Introduction

- 2.1.1 This chapter provides a description of all relevant information relating to construction, operation and subsequent decommissioning of the Proposed Development. The information presented within this chapter provides the basis of the assessments undertaken throughout the EIA process, as reported in **ES Volume II, Chapters 5 to 14**.

Supporting Technical Appendices

- 2.1.2 This chapter is supported by the following technical appendices which are provided in **ES Volume III**:

- **Appendix 2.1: Outline Construction Environmental Management Plan (OCEMP); and**
- **Appendix 2.2: Arboricultural Impact Assessment.**

Supporting Figures

- 2.1.3 This chapter is supported by, and should be read in conjunction with, the following figures which are provided in **ES Volume IV**:

- **Figure 1.2: Planning Application Boundary;**
- **Figure 2.1: Proposed Development Layout;**
- **Figure 2.1a: Proposed Development Layout Inset A;**
- **Figure 2.1b: Proposed Development Layout Inset B;**
- **Figure 2.1c: Proposed Development Layout Inset C;**
- **Figure 2.1d: Proposed Development Layout Inset D;**
- **Figure 2.1e: Proposed Development Layout Inset E;**
- **Figure 2.1f: Proposed Development Layout Inset F;**
- **Figure 2.1g: Proposed Development Layout Inset G;**
- **Figure 2.1h: Proposed Development Layout Inset H;**
- **Figure 2.2: Indicative Earthworks Requirements;**
- **Figure 2.3: Typical Turbine Elevation;**
- **Figure 2.4 Typical Turbine Foundation;**
- **Figure 2.5 Typical Crane Hardstanding;**
- **Figure 2.6: Typical Solar Panel Elevations and Plan View;**
- **Figure 2.7: Solar Transformer Plan and Elevations;**
- **Figure 2.8 Substation Layout Plan;**
- **Figure 2.9a Substation Elevations;**
- **Figure 2.9b Substation Elevations;**
- **Figure 2.9c Substation Elevations;**
- **Figure 2.10 Solar Fencing & Security Gate Elevations & CCTV;**

- **Figure 2.11 Substation Fencing & Security Gate Elevations & CCTV;**
- **Figure 2.12a Indicative Temporary Construction Compound;**
- **Figure 2.12b Indicative Temporary Construction Compound;**
- **Figure 2.13 Typical Access Track Cross Section;**
- **Figure 2.14 Indicative Cable Trench Arrangement;**
- **Figure 2.15 Indicative Watercourse Crossings;**
- **Figure 2.16 Indicative Gas Pipeline Crossing;**
- **Figure 2.17 Highway Overrun Areas; and**
- **Figure 2.18 Watercourse and Utilities Crossing Locations**

2.2 Need for the Proposed Development

- 2.2.1 The Proposed Development relates to the generation of electricity from renewable energy sources and would be a response to national energy policy and planning objectives, as well as the international need to address climate change.

Relevant Planning Policy

- 2.2.2 The Paris Agreement is a legally binding international treaty on climate change which brings together nations to combat climate change and adapt to the effects of it. It was adopted at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015 and entered into force on 4 November 2016. The Paris Agreement aims to maintain the increase in global average temperature at “*well below*” 2 degrees Celsius (°C) and “*pursue efforts*” to limit the temperature increase even further to 1.5 °C.
- 2.2.3 To support international efforts, the UK Climate Change Act was passed in 2008. It is the primary legislation that underpins action to address climate change by the UK and provides a comprehensive framework for climate change mitigation and adaptation. The Climate Change Act 2008 (as amended) sets a legal target for the reduction of greenhouse gas emissions by 2050. The target set by this Act is “*at least 100 % lower than the 1990 baseline*” by 2050.
- 2.2.4 Furthermore, the UK Government has an ambition “*to deliver 50 gigawatts (GW) of power from offshore wind by 2030 and 70 GW of power annually from solar by 2035*” (Environmental Audit Committee, 24 May 2024) and the Proposed Development would contribute to delivering this.
- 2.2.5 The Environment (Wales) Act 2016 sets a target to reduce greenhouse gas emissions in Wales by 100 % by 2050. Furthermore, the Welsh Government, BCBC and NPTC declared a climate emergency in April 2019, June 2020 and September 2022 respectively.
- 2.2.6 The Welsh Government approved a net zero target for 2050 and recognised renewable energy as a key component to achieving a reduction in greenhouse gas emissions (Welsh Government, 2022). In 2017, the Welsh Government announced a target of meeting 70 % of Wales’s electricity consumption from renewable electricity sources by 2030. This figure was updated in July 2023 and the Welsh Government has committed to the target of Wales ensuring that 100 % of its annual electricity consumption will come from renewable sources by 2035, and to continue

to keep pace with consumption thereafter (Julie James MS, Minister for Climate Change, 2023).

- 2.2.7 The 'Energy Generation in Wales' report (Regen for the Welsh Government, 2025) sets out the energy generation capacity in Wales for each year and analyses changes over time. The purpose of the report is *"to support the Welsh Government in developing energy policy and help to evidence the economic, social, and environmental benefits of Welsh energy projects"*. According to the most recent version of this report, from 2025, renewable electricity generation in 2023 was equivalent to 58 % of electricity consumption in Wales (excluding losses), down from 59 % (excluding losses) in 2022. This reduction is attributed, largely due to an estimated increase in electricity consumption. However, in reality, only 34 % of total electricity generated in Wales comes from renewable sources. Of the electricity generated from renewable sources in Wales in 2023, approximately 68 % came from onshore and offshore wind, with much of the remainder from solar PV and biomass electricity generation.
- 2.2.8 The 'Energy Generation in Wales 2023' report (Regen for the Welsh Government, 2025) notes the estimated annual renewable energy generated by region and local authority. Energy generated by renewable sources in Bridgend contributed to 3 % of Wales overall energy generated in 2023, and Neath Port Talbot 13 %. The Proposed Development would provide further opportunities to increase the renewable energy generated at a local and national level.
- 2.2.9 Future Wales: The National Plan 2040 (Welsh Government, 2021) provides a framework for planning change and development and is the highest tier of the development plan hierarchy in Wales. Policy 9 on resilient ecological networks and green infrastructure, Policy 17 on renewable and low carbon energy and associated infrastructure and Policy 18 on renewable and low carbon energy developments of national significance, provide the strategic spatial and detailed criteria-based policies for renewable and low carbon energy developments and these are the main policies against which the Proposed Development will be considered. Policy 17 provides that:
- "The Welsh Government strongly supports the principle of developing renewable and low carbon energy from all technologies and at all scales to meet Wales's future energy needs.*
- In determining planning applications for renewable and low carbon energy development, decision-makers must give significant weight to the need to meet Wales' international commitments and our target to generate 70% of consumed electricity by renewable means by 2030 in order to combat the climate emergency."*
- 2.2.10 The details of Policy 18 are set out in **paragraph 3.5.3**.
- 2.2.11 Planning Policy Wales (Edition 12) (Welsh Government, 2024) (PPW) details the land use planning policies of the Welsh Government, with the objective to ensure the delivery of sustainable development. PPW identifies that low carbon electricity must become the main source of energy in Wales. PPW also recognises that wind energy forms a key part of meeting renewable energy production due to Wales's considerable wind resource.

- 2.2.12 The national and local planning policy context applying to the Site has been considered in the iterative EIA design process, as set out in **ES Volume II, Chapter 3: Environmental Context and Reasonable Alternatives Considered**. The relevant planning policy framework has been described in each environmental factor assessment chapter (**ES Volume II, Chapters 5 to 14**). A separate **Planning Design and Access Statement**, as well as a **Green Infrastructure Statement**, have been submitted as standalone planning documents accompanying the DNS application.

2.3 DNS Application Boundary

- 2.3.1 All temporary and permanent on-site activities relating to the construction, operational and decommissioning activities of the Proposed Development, would be contained within the DNS application boundary as illustrated in **ES Volume IV, Figure 1.2: Planning Application Boundary**. The ES is based upon this planning application boundary or 'Site boundary'.
- 2.3.2 The delivery route to the Site (including abnormally large loads) and the off-site grid connection are excluded from the DNS application boundary as they would be consented via a separate process (discussed further in **Section 4.8 of ES Volume II Chapter 4: Approach to the EIA**).

2.4 Overview of the Proposed Development

- 2.4.1 The Proposed Development is expected to have a total capacity of approximately 93.5 MW. The principal components of the Proposed Development are listed below, and are described in more detail in the subsequent sections:
- Up to six wind turbines (anticipated generating capacity of approximately 43 MWac subject to final turbine selection), each up to 200 m in height to blade tip, associated infrastructure including access tracks, crane pad hardstandings, foundations, cabling, and laydown/storage areas and a 50 m micro-siting allowance for the turbines and ancillary infrastructure;
 - Solar PV modules (anticipated generating capacity of approximately 50.5 MWac subject to final PV selection) and associated infrastructure including inverters, transformers, associated mounting structures, fencing, CCTV, cabling and access tracks;
 - An on-site electrical 33 kV/132 kV substation to connect the solar PV modules, and wind turbines to the electricity network, including transformers, switchgear, busbars, control equipment buildings including an office, control functions, material storage, firewalls, cabling, as well as wider monitoring and maintenance equipment;
 - On-site underground electrical cables linking the wind turbines, solar PV and the on-site substation, generally laid in trenches alongside access tracks where possible;
 - Site access from the northeast (A4063) and south (New Road). Total wind track length is approximately 11.5 km, including approximately 7.9 km new tracks and approximately 3.6 km upgrades to existing tracks, with vehicle turning heads and passing places as required as well as localised overrun areas to the Ffordd-Y-Gyfraith highway;

- A permissive footpath is proposed along part of the on-site access tracks to improve access, particularly during wetter months;
- Watercourse crossing and associated infrastructure;
- Landscaping and biodiversity enhancements; and
- Drainage infrastructure.

2.4.2 In addition to the above, the following temporary components, integral to the Proposed Development, are proposed during the construction phase:

- An initial construction and storage compound at the northern site entrance to facilitate construction of water crossing prior to its relocation further into the Site;
- A subsequent temporary construction and storage compound and laydown area, located further into the Site; and
- Temporary tracks to facilitate construction access into some solar parcels.

2.5 Operational Design Components

Infrastructure Layout

2.5.1 The layout of the Proposed Development is shown in **ES Volume IV, Figure 2.1: Proposed Development Layout**. Design elements are illustrated in **ES Volume IV, Figures 2.2 to 2.16**.

2.5.2 Each component of the Proposed Development is described in further detail in this chapter with supporting figures provided in **ES Volume IV**.

Wind Turbines

2.5.3 The Applicant is seeking consent for the installation and operation of six, three bladed horizontal axis turbines. The proposed coordinates for these wind turbines, subject to micro-siting considerations (50 m), are set out in **Table 2.1**.

Table 2.1 Proposed Turbine Locations

Turbine number	Easting	Northing
T01	286968	186094
T02	286459	186354
T03	285774	186016
T04	285686	186503
T05	285732	186989
T06	284660	186283

Table Note: The proposed turbine locations are consistent with the locations proposed and consulted on during the Pre-Application Consultation period (between April 2025 and June 2025), with the exception of a small change to the location of T06. Any differences in the proposed coordinates of the other turbines is associated with rounding.

Wind Turbine Design

- 2.5.4 The turbines would be three bladed, horizontal axis turbines with solid tubular towers. The blades would be attached to a rotor hub, which connects to the nacelle that would house a turbine generator and other operating equipment. The blades would be made from reinforced composite materials such as fibreglass.
- 2.5.5 The maximum height of the turbines would be 200 m from ground level to the tip of the blade in an upright position, herein referred to as the 'tip height'. An indicative turbine for the Proposed Development is shown in **ES Volume IV, Figure 2.3: Typical Turbine Elevation**.
- 2.5.6 The final choice of turbine model and the specification of the hub height and rotor diameter will be subject to a selection process (prior to construction) considering technical, environmental and commercial aspects. Where it has been necessary to select a specific representative turbine model or component size for the purposes of undertaking the environmental assessment, this has been highlighted in the individual assessment chapter. To inform the EIA, the following three candidate turbines have been considered:
- Vestas EnVentus V162 7.2 MW;
 - Siemens Gamesa SG155 6.6 MW; and
 - Nordex N163 6.0 MW.
- 2.5.7 Each environmental factor assessment reported in this ES has assessed the turbine which would result in a reasonable 'worst-case scenario' in terms of turbine dimensions/characteristics to ensure a robust assessment has been undertaken. This is discussed further in **ES Volume II, Chapter 4: Approach to the EIA**.
- 2.5.8 The wind turbines would be of the same basic appearance and colour. It is proposed that the turbines would be of a light grey colour finish. Although off-white has been an accepted colour for turbines, more recently constructed wind turbines have been a mid-grey tone, which reduces the distance over which turbines are visible, especially in dull weather or low light conditions. The choice of material and colour for the proposed turbines is an important consideration in terms of visual impact. Finishing would be expected to be agreed by a condition placed on consent.

Wind Turbine Micrositing

- 2.5.9 Although the design process seeks to combine environmental and economic requirements, the Applicant would nevertheless seek some flexibility, where necessary, in micro-siting the exact positions of the proposed wind turbine infrastructure. This tolerance allows for minor changes in turbine and associated infrastructure location to respond to possible variations in ground conditions across the Site, which will be confirmed following detailed site investigation work carried out prior to construction.
- 2.5.10 Any micro-siting would not encroach into environmentally constrained areas, but could, for example, avoid unrecorded archaeological features which might be revealed during the construction phase.

- 2.5.11 Therefore, the DNS application includes a 50 m allowance for micro-siting of the wind turbines and associated infrastructure. If planning permission is granted, the Applicant will commission further investigative surveys to inform the detailed engineering design; it is proposed that a planning condition for the submission of a micro-siting scheme be placed on any permission.

Wind Turbine Foundations

- 2.5.12 Turbine foundations would be dependent upon site-specific ground conditions at the turbine locations. However, it is envisaged that installation of the turbines using a steel reinforced concrete base (gravity foundation) would be suitable.
- 2.5.13 The concrete gravity foundations would be located underground. Therefore, a quantity of earth would need to be removed. The amount of earth to be removed would depend upon site-specific ground investigations at each turbine location. Topsoil and other material would be removed from the foundation area and stored so that it may be used later for reinstatement. Indicative details on construction requirements and metrics are discussed and analysed further in **ES Volume III, Appendix 14.1: Carbon Calculator Tool**.
- 2.5.14 Turbine foundations would be set down to the depth of suitable bearing strata with an approximate diameter of 25 m with a circular shape (see **ES Volume IV, Figure 2.4: Typical Turbine Foundation**) for indicative turbine foundations. Should geotechnical investigations demonstrate that the required bearing capacities are not achievable, then a piled foundation design would be adopted using the same overall design footprint.
- 2.5.15 An anchor ring and foundation bolts would be cast into a central column onto which the turbine tower would be fixed.
- 2.5.16 For the purposes of this ES, a maximum (worst-case) scenario for turbine foundations of a 3 – 4 m depth and 25 m by 25 m circular footprint has been assumed. The concrete bases would be allowed to cure (i.e., reach its design strength) before turbines are fitted.

Wind Turbine Erection

- 2.5.17 The turbine components would be delivered to the relevant storage area for each component, whether it be to a specific turbine hardstanding or to a storage area located at the construction compound, until weather conditions are appropriate for turbine erection. The bottom turbine tower section would firstly be fixed to the anchor ring and foundation bolts embedded into the central column of the foundations, followed by the upper turbine tower sections, all being lifted into place by two cranes (a heavy lifting capacity crane, and a smaller service crane). The cranes would then lift the nacelle into place on the top section of the turbine tower. Blades would then be fitted individually to the rotor hub.

Wind Turbine Hardstanding

- 2.5.18 Level hardstanding areas are required adjacent to each turbine base for the operation of a heavy lifting capacity crane, and a smaller service crane, used for assembly of the turbine components. They would also be used as storage areas for the turbine components. The hardstandings would be to the same general specification as the turbine access tracks that they adjoin, but a slightly greater depth of construction is envisaged.
- 2.5.19 It is anticipated that each permanent hardstanding would be approximately 6,945 m² with a 6 m wide track running along the length of the hardstanding as shown in **ES Volume IV, Figure 2.5: Typical Crane Hardstanding**. The cut-and-fill batters required on the hardstandings would be dictated by pre-construction detailed ground Investigation surveys. In addition to the hardstanding for the main assembly crane, up to three additional temporary crane pads may be required for crane assembly.
- 2.5.20 The hardstandings would be constructed using suitable surplus material generated from the excavation process elsewhere within the turbine area and from local quarries. Topsoil would be excavated, and stone laid and compacted to the required depth. The depth of the hardstandings would be dependent on the ground conditions at specific locations.
- 2.5.21 Soils that are excavated during construction would be set aside for backfilling of foundations and reuse in restoration of disturbed areas around the turbine locations and hardstandings.
- 2.5.22 Hardstanding areas at each turbine location would be retained for use during operation and decommissioning. The edges would as far as possible be blended to the adjacent contours and natural vegetation allowed to re-establish.

Wind Turbine Aviation Warning Lighting

- 2.5.23 The Proposed Development's turbines would exceed 150 m maximum height to tip, therefore need to be lit in accordance with the requirements of the Civil Aviation Authority's (CAA) Air Navigation Order 2016 (ANO), in addition to meeting the lighting requirements of the Ministry of Defence (MOD). Dispensations for reduced lighting schemes can be agreed with the CAA, according to the guidance provided in CAP-76482.
- 2.5.24 In response, a reduced lighting scheme has been designed which aims to identify the outline of the renewable energy park by using 2000 candela (cd) visible red lights on three perimeter turbines (turbines 1, 5 and 6). Based on meteorological data obtained for the last 30 years at the closest meteorological station (Cardiff Airport), it is expected that the lights would operate at 200 cd for approximately 88 % of the time when not obscured by cloud cover.
- 2.5.25 All six of the turbines would be lit using MOD Infra-Red (IR) lights. MOD IR lights have been developed to be invisible to the public at large but detectable to aircrew night vision aids. As such the MOD IR lights can have a wide beam width and flash continuously without disturbing the visible environment.

- 2.5.26 Further details of the proposed turbine lighting scheme and its rationale is provided in **ES Volume III, Appendix 4.5: Wind Farm Aviation Lighting and Mitigation Technical Appendix.**

Wind Turbine Transformers

- 2.5.27 A transformer would be required for each turbine. It is assumed that the turbine type selected would have the electrical transformers located within the turbines. The transformers would either be oil-filled with a bunded footing or oil collection tank to remove any risk of spillage or a solid cast resin type which is effectively non-polluting.
- 2.5.28 The transformers would increase the electrical voltage to 33 kilovolts (kV) and would be connected to the control building within the on-site substation via underground high voltage (HV) 33 kV power export cables. These would be laid in trenches that run alongside the access tracks. Indicative cable trench details are provided in **ES Volume IV, Figure 2.14: Indicative Cable Trench Arrangement.**
- 2.5.29 The cable trenches would be excavated to a minimum depth of 1.25 m, locally deeper e.g. at switchgear, and backfilled. Typically, the number of power export cables in a section would be three (one per phase laid in trefoil). However, there would be sections where the power export cables need to run in parallel as they converge on the substation, in which case there would be up to 5 m separation distance between power export cable sets, for instance one set either side of the track.
- 2.5.30 A Supervisory Control and Data Acquisition (SCADA) system would be installed to gather information from individual turbines and provide facility to control them from a central location. A fibre optic communications cable would run alongside the power export cables to link the turbines to the SCADA system. The wind turbines can therefore be monitored remotely via a telephone or data connection to the SCADA system.

Wind Turbine Operation

- 2.5.31 The turbines would start operating when the wind speed reaches the 'cut-in' wind speed. This is the minimum wind speed needed for the turbine blades to start rotating to generate electricity. A sensor (one of the operating equipment mounted on each turbine) would determine when there is sufficient wind for operation, at which time the turbine would rotate so that the blades are orientated into the wind.
- 2.5.32 In the event of extreme wind speeds the turbines would shut down until the wind speed has dropped to a level where it can safely start operating again.
- 2.5.33 The turbines would restrict the turbine blade rotation under prevailing meteorological conditions (sunshine and sun angle) where this would be likely to cause adverse shadow flicker effects at nearby properties. Turbines would be fitted with light sensors should automated mitigation be required after commissioning.
- 2.5.34 In cold weather, ice can build up on blade surfaces. The turbine can continue to operate with a very thin accumulation of snow or ice but would shut down automatically should the build up cause aerodynamic or physical imbalance of the rotor. The turbine would only start again once the ice or snow has thawed. At which point, there is a small possibility that fragments of the ice or snow drop within close

vicinity of the turbine. However, due to the initial slow rotational speed of the turbine as it restarts, the risk to public safety is considered to be extremely low (as discussed in **Table 4.1**).

- 2.5.35 Any additional operating mode requirements have been set out in the environmental factor assessment chapters in **ES Volume II, Chapters 5 to 14**.

Substation and Control Building Compound

- 2.5.36 The substation compound is located in the north of the Site and will house the outdoor electrical high voltage equipment, transformer and control buildings for the Network Owner and the Proposed Development.
- 2.5.37 An indicative substation is shown in **ES Volume IV, Figure 2.8: Substation Layout Plan** and would occupy an area of approximately 74 m by 106 m, with all equipment to be surrounded by 2.4 m high security fencing. The substation compound will be constructed to the Network Owner's specification.
- 2.5.38 The substation compound would contain a control building and electrical equipment (including switchgear, transformers, communications equipment and protection equipment), vehicular access, and parking. Typical elevations for the compound and control building proposed are shown in **ES Volume IV, Figure 2.9: Substation Elevations (set of 3)**.
- 2.5.39 The purpose of the on-site substations is to convert low voltages from electricity generation to high voltages, or vice versa, using power transformers.
- 2.5.40 Rainwater would be collected from the roof of the control building via a gutter and inlet pipe to the below ground drainage and discharged locally via a Sustainable Drainage System (SuDS), to a vegetated attenuation basin on one side of the hardstanding. Waste would be held in a closed system and would be removed by a licensed contractor at regular intervals. Further details are provided in **ES Volume III, Appendix 6.2: Flood Consequence Assessment and Surface Water Drainage Statement**.
- 2.5.41 The control building would be constructed in keeping with the local environment, the appearance of the control building would be agreed with BCBC via planning condition.

Solar PV Panels, Frames and Inverters

- 2.5.42 Solar panels generate electrical power by using a solar PV module to convert sun light into direct current (DC) electricity. Individual solar PV modules, more commonly known as solar panels, contain several PV cells wired and encapsulated by tempered glass. Solar PV modules are sealed for weatherproofing and held together by a metal frame in a mountable unit.
- 2.5.43 Solar PV modules are fixed to mounting structures in groups known as 'strings'. The exact number and arrangement of modules depends on a range of factors including the size of the system, its location, and the direction in which the solar panels are installed. As technology and equipment are evolving, some flexibility in design is required to accommodate technology advances.

- 2.5.44 Individual solar PV modules are typically 2 m by 1 m in width and depth and can vary in height. The assessment has been undertaken based on a width of 2.3 m, depth of 1.1 m and an angle of approximately 20 degrees resulting in a height of 0.9 m from the ground and a maximum height of 3.0 m.
- 2.5.45 The solar PV modules would be installed as fixed arrays orientated to the south. The typical solar design and elevation proposed is shown in **ES Volume IV, Figure 2.6: Typical Solar Panel Elevations and Plan View.**
- 2.5.46 The solar PV modules are expected to cover approximately 36 % of the total land within the solar panel areas (approximately 4.1 % of the total Site area). The modules would be separated with a minimum row separation space of 3.35 m. The spacing between the rows would vary across the Site depending on topography, orientation, minimising effects of overshadowing and to ensure optimal efficiency. The solar PVs will have an installed capacity of approximately 50.5 MWac.
- 2.5.47 String inverters would be sensitively located throughout the solar parcels on the rear of the PV modules, The typical inverter design and elevation proposed is shown in **ES Volume IV, Figure 2.6: Typical Solar Panel Elevations and Plan View.**

Solar Transformers

- 2.5.48 Spaced within the solar array will be approximately 18 transformers housed in shipping container structures, as shown in **ES Volume IV, Figure 2.7: Solar Transformer Plan and Elevations.** The transformers convert the low voltage output from the inverters to medium voltage suitable to be further stepped up at the on-site substation. They would have dimensions of up to 12.2 m x 2.4 m and a height of up to 3.4 m.

Distribution Cables

- 2.5.49 Power export cables are required to connect the various generation/storage technologies to the on-site Substation. These would be laid in trenches that run alongside the access tracks. Indicative cable trench details are provided in **ES Volume IV, Figure 2.14: Indicative Cable Trench Arrangement.**
- 2.5.50 The cable trenches would be excavated to a minimum depth of 1.25 m and backfilled. Typically, the number of power export cables in a trench would be three (one per phase laid in trefoil). However, there may be sections where the power export cables need to run in parallel as they converge on the substation, in which case there would be up to 5 m separation distance between power export cable sets, for instance one set either side of the tracks.
- 2.5.51 A SCADA system would be installed to gather information from individual turbines as well as data cables installed within the Solar PV to provide a facility to control them from a central location. Fibre optic communications cables would therefore run alongside the power export cables to link the turbines and solar to the central control system. The equipment can therefore be monitored remotely via a data connection.

Fencing and Security

- 2.5.52 Fencing would be required to secure the substation, and solar infrastructure. Indicative fencing and gate details are provided in **ES Volume IV, Figure 2.10 Solar Fencing and Security Gate Elevations & CCTV** and **ES Volume IV, Figure 2.11: Substation Fencing & Security Gate Elevations & CCTV**.
- 2.5.53 The substation compound would be fenced by 2.4 m high palisade fencing; assumed to be a dark green colour. The solar areas would be fenced using post and stock proof wire mesh fencing (deer fencing) to a maximum height of 2.4 m.
- 2.5.54 Gates (approximately 6 m wide) would be required where the access tracks enter any fenced off area.
- 2.5.55 CCTV infrared cameras would be mounted on poles, with a maximum height of 3.6 m, interspersed throughout the Site, along the boundaries, where necessary and would face inwards towards the Site only. It is proposed the detailed specification and location is controlled via a planning condition.

Access from the Local Highway

- 2.5.56 Two site accesses are proposed into the Site; a northern access from the Maesteg Road and a southern access from the New Road. The proposed northern and southern access utilise existing or historic access points to the Site.
- 2.5.57 The northern access point would provide access for all construction material, Abnormal Indivisible Loads (AIL) and ongoing operational traffic. The southern access point to the Site would provide an additional access for abnormal loads associated with the turbine equipment; this would be an entrance only as any abnormal load deliveries using this entrance would contract to a normal Heavy Goods Vehicles (HGV) size once the load had been delivered and exit the Site through the northern entrance.
- 2.5.58 Within the centre of the Site, to provide connectivity between turbine locations and the solar areas, and to minimise environmental impacts, the existing adopted highway, Ffordd-y-Gyfraith would be utilised, with constructed overrun areas for the AIL vehicles, as necessary. The general arrangement of the highway junctions and overrun areas is provided in **ES Volume III, Appendix 12.3: Highway Junctions General Arrangements** and **ES Volume IV, Figure 2.17: Highway Overrun Areas**.
- 2.5.59 Any areas of over-run required to facilitate the delivery of the abnormal load turbine components would remain in situ for the operational life of the Proposed Development, however it is proposed to construct these areas from grasscrete, or similar, in order to minimise the visual impact once the area has revegetated. Access to these widened areas would be controlled via removable bollards during the construction phase and then fenced off during the operational phase to minimise impacts.
- 2.5.60 The Site entrances would be maintained and monitored during the operational life of the Proposed Development (50 years).

Site Access Tracks

- 2.5.61 From the Site entrances, approximately 7.9 km of new site access tracks would be constructed as part of the Proposed Development. Approximately 3.6 km of existing farm tracks would be upgraded as part of the Proposed Development. Site tracks are required throughout the operational phase of the Proposed Development to permit access for maintenance and repair operations. They would also allow access during the decommissioning phase.
- 2.5.62 The Site access track layout has been designed to minimise environmental disturbance by avoiding sensitive features and keeping the length of track commensurate with the minimum required for operational safety. The nominal running width would be approximately 6 m, although track widths may be wider in some sections to accommodate bends in the road alignment. The tracks would be constructed of compacted stone with a minimum construction thickness of access tracks would be 600 mm. A typical Site access track cross-section is shown in **ES Volume IV, Figure 2.13: Typical Access Track Cross Section**. Temporary track mats would also be used in the solar areas to minimise disturbance to the ground from machinery and the number of permanent tracks.
- 2.5.63 The Site access track layout, from the north-eastern access up the hillside, includes seven passing places for safe vehicular access and egress. In addition, six turning heads would be constructed adjacent to turbine locations to accommodate empty abnormal load turning.
- 2.5.64 Adjacent to the track would be an assumed 1.2 m verge for cabling alongside an appropriate drainage verge which is subject to approval from the SuDS Approving Body (SAB).
- 2.5.65 Generally, the sloping verges of access tracks would be reinstated through re-seeding with locally occurring species, top-soil reuse and/or turf replacement to blend in with the surroundings. Measures such as grass-reinforcement may be applied where the track widens on steeper bends and in passing places if suitable material is generated during the construction of the track. The adjacent grassland would be allowed to extend across the edges and middle, reducing the extent of the visibility of tracks in the landscape. The engineered appearance of any embankments would be smoothed out to ensure any landforms blend in with topography.

Watercourse Crossings

- 2.5.66 There are two proposed crossing points within the Site. This includes the crossing of an unnamed ordinary watercourse to facilitate the northern access and a crossing of Nant Cwm-bach to facilitate the internal access track. These crossings are proposed to be in the form of bottomless box/arch culverts or a single-span bridge.
- 2.5.67 Any further small crossings (<2 m wide) would likely be constructed as a pipe culvert, with a concrete surround if required. **ES Volume IV, Figure 2.15: Indicative Watercourse Crossings** shows an indicative watercourse crossing design. The exact specifications of watercourse crossings will be subject to detailed engineering design prior to construction. All crossings will be designed taking into account best practice guidance and will be agreed with Natural Resources Wales (NRW).

Utility Crossings/Alteration

- 2.5.68 There are various overhead lines (OHLs) that pass through the solar areas of the site which the layout has been designed to accommodate with standard off-sets. A dual 66 kV National Grid Electricity Distribution (NGED) OHL crosses the proposed access track south of Cwm Risca and an 11 kV NGED OHL crosses the proposed access track west of Cwm Risca, as shown on **ES Volume IV, Figure 2.18: Watercourse and Utilities Crossing Locations**. The Applicant has consulted NGED in relation to the OHLs to ensure that they would not be an obstacle during AIL deliveries. Specific requirements for diversionary and/or protections to existing utility apparatus will be progressed following on any planning permission. Options, as proposed by NGED, include raising the poles (subject to the necessary consent, if required), dropping the circuit outage for the construction on a temporary basis or diversion of the OHL (which would be subject to NGED undertaking their own surveys and assessments via their separate Diversion Request Enquiry process). Further consultation with NGED would be undertaken following the grant of any planning consent to determine the final solution.
- 2.5.69 There are also a number of gas pipes that pass through the Site, operated by Wales & West Utilities. Where required, off-sets and/or reinforcement will be incorporated into the detailed engineering design. **ES Volume IV, Figure 2.16: Indicative Gas Pipeline Crossing** shows an indicative gas pipeline crossing; the final design will be agreed with the utility operators. **ES Volume IV, Figure 2.18: Watercourse and Utilities Crossing Locations** shows the locations where crossings and alterations are required.

Biodiversity Enhancement Proposals

- 2.5.70 A number of biodiversity enhancement measures are proposed as part of the Proposed Development.
- 2.5.71 The Proposed Development will deliver approximately 93.1¹ ha of new and enhanced habitats in order to support species on-site including nesting birds, bats, dormice, grassland fungi, invertebrates and mammals.
- 2.5.72 Created and enhanced habitats include 19.05 ha of semi-natural broad-leaved woodland, 3.26 km of hedgerow planting, 26.08 ha of marshy grasslands to provide dedicated habitat for marsh fritillary (13.86 ha) and ground nesting birds (12.22 ha¹), along with the enhancement of 47.97 ha¹ of grassland habitat to support the existing fungi assemblage. These will be monitored through a management plan to ensure the habitats effective establishment. Further details on enhancement measures are outlined in the standalone **Green Infrastructure Statement** and **ES Volume III, Appendix 10.4: Net Benefit for Biodiversity Report**.

2.6 Construction Phase

- 2.6.1 This section sets out the key construction activities and strategy of the Proposed Development. The construction arrangements described in this section provide the basis for the assessment presented in this ES.

¹ Of which 6.38 ha is enhancement for both nesting birds and grassland fungi.

- 2.6.2 A series of assumptions have been made in relation to these arrangements and where this has been the case, it is stated within this chapter. These assumptions have been informed by the Applicant, based on previous experience of similar projects.

Overview of the Construction Phase

- 2.6.3 The construction of the Proposed Development is anticipated to comprise the following general stages:
- Advance works including:
 - Site investigations;
 - Pre-construction environmental surveys (if required);
 - Preliminary mitigation works; and
 - Advanced Site access works.
 - Site mobilisation and access improvements including:
 - Construction/upgrading of Site access tracks off the New Road and A4063;
 - Construction of the temporary construction compound;
 - Construction of all on-site access tracks;
 - Construction of new bridge over the unnamed watercourse;
 - Construction of temporary and permanent drainage measures and cable trenches;
 - Laying of electricity and communications cables in trenches;
 - Construction of turbine foundations, crane hardstandings and laydown areas;
 - Construction of control building and electrical compound;
 - Construction of substation;
 - Delivery, installation, testing and commissioning of wind turbines and ancillary equipment;
 - Construction of solar PV areas; and
 - Site finalisation works, including restoration.

Programme

- 2.6.4 The construction of the Proposed Development is anticipated to be undertaken over a 24-month period. During this period, a number of sequential key construction activities, “stages”, would be undertaken (although there is likely to be some overlap between each stage/individual processes). Where appropriate, these stages are discussed in further detail within the following sub-section.
- 2.6.5 An indicative construction programme illustrating likely periods for each of the core construction activities is provided in **Table 2.2**.

Table 2.2 Indicative Construction Programme

Activity	Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Site mobilisation/ set up and access upgrading of access junctions and river crossing works																								
Construction of new access tracks and crane hardstanding																								
Turbine foundation construction																								
Substation and electrical works																								
Cable trenching and installation																								
Crane delivery and demobilisation																								
Turbine delivery, erection and commissioning																								
Solar foundation construction and solar infrastructure delivery, erection and commissioning																								
Site reinstatement and demobilisation																								

- 2.6.6 The starting date for construction activities would largely be dependent upon the date that consent may be granted and grid connection availability; subsequently, the programme would be influenced by constraints on the timing and duration of any mitigation measures confirmed in the individual environmental factor assessment chapters or by the consent decision, as well as factors such as weather and ground conditions experienced on the Site.
- 2.6.7 The final length of the programme would be dependent on seasonal working and weather conditions. Summer months are favoured for construction due to longer periods of sunlight allowing longer working days. Summer months are generally also drier which aids the construction progress and reduces the impact of site debris reaching the public highway (e.g. mud, etc.), though wheel wash facilities would be installed at the main site entrance/exit point, if appropriate. Wet weather has the potential to complicate construction activities due to increased runoff, although these complications can be minimised through the use of “stop rules” if appropriate. ‘Best practice’ guidance for construction activities will be outlined in the **ES Volume III, Appendix 2.1: Outline Construction Environmental Management Plan**.
- 2.6.8 For the purpose of the assessment, the construction works are anticipated to begin in 2029 and be completed in 2031. However, it should be noted that the programme dates and duration are indicative and have been informed by professional experience from similar projects. Changes to the above programme would not materially affect the findings of the assessments reported within this ES. Any exceptions to this have been noted within the relevant environmental factor assessment chapter.

Site Logistics

Site Working Hours

- 2.6.9 In general, working hours for construction would be from 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturday. No work is proposed on Sundays and public holidays unless otherwise agreed with BCBC/NPTC or in case of emergency.
- 2.6.10 Exceptions to the proposed working hours would be made for foundation pours and turbine erection. Concrete pouring for an individual turbine must take place continuously and so activity would only cease when the pour has been completed. In addition, safe turbine erection can only occur during periods of low wind speeds and so lifting operation may need to be scheduled outside of the above hours. In addition, it may be necessary to complete a particular lifting operation to ensure the structure is left safe.

Construction Employment

- 2.6.11 The number of construction staff present on-site would vary according to the construction phase and activities being undertaken. Staffing levels would generally decrease as construction progresses through to the commissioning phase. The estimated maximum number of staff present at any one-time during construction of the Proposed Development is approximately 45. The precise numbers would

depend on the ongoing activities at any time. The peak workforce numbers are likely to be over a 2-month period in towards the end of the civils phase of the works.

- 2.6.12 In addition to direct employment opportunities, the construction Site would bring benefits to local businesses such as in the supply of materials or services for construction and in accommodation for workers and catering.

Health and Safety

- 2.6.13 All construction activities would be managed in accordance with the requirements of the Construction (Design and Management) Regulations 2015 and the Health and Safety at Work etc. Act 1974. The Principal Designer has taken full account of these requirements throughout the design evolution of the Proposed Development.
- 2.6.14 The Principal Contractor would be responsible for ensuring that possible health and safety risks are understood by all site operatives as are the safety procedures and work instructions for each activity. It is anticipated this would be managed through the site induction and relevant work package plans.
- 2.6.15 Risk assessments would be undertaken for all construction activities, with measures put in place to manage the risk from any hazards identified to be as low as reasonably practicable.

Temporary Construction Compounds

- 2.6.16 The temporary construction compounds would act as the main interface between the construction work sites and the public highway. The compounds have been included as part of the Proposed Development please refer to **ES Volume IV, Figure 2.1: Proposed Development Layout**.
- 2.6.17 An initial compound is proposed to be located close to the northern Site access point and set back approximately 12 m from the A4063 to control all access on to the Site. The initial compound will measure approximately 3,270 m² and would be used to facilitate the site mobilisation, access upgrading and the construction of the water crossing.
- 2.6.18 Once the bridge/ culvert has been built along the northern access track, the construction compound would be relocated further into the Site (along the access track) and split into two areas measuring 3,740 m² and 4,147 m², as shown in **ES Volume IV, Figure 2.1: Proposed Development Layout**. Typical arrangements for the proposed compounds are provided in **ES Volume IV, Figure 2.12: Indicative Temporary Construction Compound**.
- 2.6.19 The construction compounds would include space for:
- Temporary modular building(s) to be used as a Site office;
 - Welfare facilities;
 - Parking for construction staff and visitors;
 - Reception area;
 - Fuelling point or mobile fuel bowser;
 - Secure storage areas for tools, materials and plant;
 - Waste storage facilities; and

- Laydown area.
- 2.6.20 The construction disturbance associated with the temporary construction compounds would be minimal. Typically, surface soils will be stripped and stockpiled, and the surface would then be capped with geofabric and aggregate to form a compacted stone surface, similar to the new access tracks; surface water would be managed on-site through conveyance.
- 2.6.21 During the construction phase, it is proposed that surface water from the temporary compounds is collected by perimeter french drains with a perforated pipe at their base, which convey water into a swale, followed by a settlement basin on the downslope edge of the compounds. Straw bales located in the temporary swales would remove silts and solids from the surface water before entering into the temporary settlement basins. The basins will be sized to store runoff up to and including the 1 in 100 year plus 30% climate change event.
- 2.6.22 Discharge from these basins would be discharged at a rate of 4.6 l/s/ha, connecting in three locations to the unnamed ordinary watercourses located in the north-west of the Site. These are tributaries of Afon Llynfi and convey flow north-west/west. Penstock valves can be provided at these discharge locations to allow for containment of spillages.
- 2.6.23 The straw bales will be inspected after each runoff producing rainfall event and daily during prolonged rainfall events and replaced as necessary. A maintenance and inspection plan for all settlement basins will be included in the regular weekly and rain event inspections of stormwater best management practices.
- 2.6.24 The temporary surface water drainage design will be developed during detailed design, with a full inspection and management plan of the temporary drainage features developed.
- 2.6.25 CCTV would be installed within the construction compounds as required and the perimeter secured by a temporary security fence. Should further mobile compounds be required, these would be located within areas proposed for other infrastructure such as the substation.
- 2.6.26 The construction compound and laydown area would be retained for the duration of the construction phase and then reinstated. Similarly, the temporary drainage features would be retained for the duration that the construction compound they support is in use. Upon completion, the drainage features would also be reinstated.

Construction Lighting

- 2.6.27 Artificial lighting would be required during the construction phase to ensure safe working conditions, during periods of limited natural light. Examples include vehicle and plant headlights, construction compound lighting, floodlights and mobile lighting units, to be used around specific construction activities. It is intended that the type of lighting would be non-intrusive (e.g. directed down and towards works activity and away from the Site), to minimise impact on local properties and any other environmental considerations.

Construction Site Fencing

- 2.6.28 The construction compound would be fenced throughout the works. Fencing would be kept to a minimum and used for health and safety purposes, acoustic mitigation, security and animal welfare, as and when required.

Construction Traffic

Introduction

- 2.6.29 The largest volume of traffic is anticipated during the construction phase of the Proposed Development, when vehicles are likely to be travelling from major centres and the Port of Entry (PoE) to deliver materials to the Site. The origins of materials and goods are expected to be from the Port of Swansea and local quarries located off junction 37 of the M4. Further detail is provided in **ES Volume II, Chapter 12: Traffic and Movement**.
- 2.6.30 During the construction period, the following traffic would require access to the Site:
- Staff transport;
 - Construction equipment and materials, deliveries of machinery and supplies such as crushed rock; and
 - Abnormal loads comprising wind turbine components, solar PVs, grid infrastructure and also heavy lift crane(s).
- 2.6.31 The proposed construction routes to Site are illustrated in **ES Volume IV, Figure 12.2: Abnormal Load Delivery Route** and **ES Volume IV, Figure 12.5: Construction Traffic Distribution**.

Construction Staff

- 2.6.32 Staff would arrive in non-HGV vehicles (cars or minibuses) and would access the site via the northern access. The construction workforce on-site would depend on the activities being undertaken at the time. The maximum number of staff expected on-site at any one time is likely to be no more than 45 per day.
- 2.6.33 For the purposes of estimating traffic movements within **ES Volume II, Chapter 12: Traffic and Movement**, a peak workforce requirement of 45 construction staff travelling to the Site in cars/light goods vehicles in single occupancy vehicles has been assumed. However, car sharing would be encouraged and therefore it is anticipated the actual movements will be much less.

Abnormal Indivisible Load deliveries

- 2.6.34 The wind turbines are broken down into components for transport to the Site. The nacelle, blades and tower sections are classified as AIL due to their weight, length, width and height when loaded.
- 2.6.35 The turbine components will be delivered using appropriate steerable hydraulic and modular trailer equipment where this is required. Axle loads will be appropriate to the roads and access tracks to be used. The transportation of turbine components will be conducted in agreement with the relevant loads authorities and Police. The

developer will notify the police of the movement of abnormal length (e.g. turbine blade delivery) and abnormal weight (e.g. crane) vehicles and will obtain the appropriate authorisations prior to any abnormal vehicle movements.

- 2.6.36 In addition to the turbine deliveries, one high-capacity erection crane would be needed to offload a number of components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that are escorted by boom and ballast trucks to allow full mobilisation on Site. Smaller erector cranes (up to a capacity of 200 tonnes) would also be present to allow the assembly of the main crane and to assist with the overall erection of the turbines.
- 2.6.37 Escort vehicles would accompany the AIL convoys to support the traffic management measures. Up to three vehicles would be deployed and it is assumed that three turbine components would be delivered per convoy.
- 2.6.38 AIL would be routed from the M4 to enter the Site through either the northern or southern access junctions. Both of the Site access junctions have been designed to accommodate the AILs and it is anticipated that both access points would be used as needed during the delivery of AILs.
- 2.6.39 At present the split of deliveries using either entrance is not known and therefore assessments have considered a 'worst-case' scenario where all AILs would access the Site through one or the other. Further detail is provided in ES Volume II, Chapter 12: Traffic and Movement.

General and Material Deliveries

- 2.6.40 Throughout the construction phase, general deliveries would be made to the Site by means of HGV. These would include plant, material, fuel, site office and staff welfare facilities. These deliveries would enter the Site using the northern access only.

Construction Traffic Management

- 2.6.41 A detailed Construction Traffic Management Plan (CTMP) will be prepared and agreed with BCBC/NPTC in advance of the construction phase through the discharge of planning conditions. The CTMP would demonstrate compliance with national and local policy guidance and would set out detailed descriptions of actions required by Contractors to meet during the construction process, following these objectives:
- Ensure that movements of people, plant and materials are achieved in a safe, efficient, timely and sustainable manner;
 - Ensure that any impact to local communities and the local economy is reduced as far as reasonably practical;
 - Seek to minimise the number of deliveries during network peak period;
 - Reduce and control construction vehicle trips where practicable;
 - Ensure that strategies and mitigation measures are implemented and adhered to through continued monitoring, review, and improvement; and
 - Limit the effects of construction traffic on the Local Road Network.

- 2.6.42 An Outline CTMP has been produced to accompany this ES and is provided within **ES Volume III, Appendix 12.1: Outline Construction Traffic Management Plan**.

Public Rights of Way (PRoW) Management

- 2.6.43 All PRoW would be kept open during construction as far as is practicable and safe. Where it would not be practicable and safe, there may be a requirement for some PRoW to be temporarily diverted or temporarily closed.
- 2.6.44 **ES Volume III, Appendix 13.1: Outline Access Management Plan** provides an overview of the management of temporary diversions during the construction period of the scheme. In summary:
- Users of the PRoW will be separated from construction traffic through the use of temporary fencing;
 - The Principal Contractor will ensure that speed limits are always adhered to by their drivers and associated subcontractors, particularly within close proximity to the PRoWs and at crossing points;
 - Signage will be installed on the Site exits that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians and cyclists in the area; and
 - Due to an on-site bridleway, training will be provided for all HGV staff on management measures recommended by the British Horse Society.

Construction Approach

Construction and Upgrading of Tracks

- 2.6.45 A cut track design is proposed for new tracks, which would be achieved by excavating through to a suitable formation.
- 2.6.46 During construction, vegetation, topsoil and subsoil would be placed in separate piles to the sides of the tracks. On overburden soil, suitably graded capping material approximately 600 mm would be applied to form tracks and additional material would be applied where deemed necessary by the detailed design. On rock, suitably graded running layer of a minimum thickness of 150 mm would be applied. The total track depth would depend on the strength of the base formation and upon the gradient of the slope being traversed.
- 2.6.47 Where existing tracks require upgrading this would be undertaken by localised widening to match the width of adjoining new track.
- 2.6.48 Drainage ditches, aligned to SuDS standards, would be constructed alongside the access tracks. Where possible, the runoff from the access roads would be captured and stored within conveyance swales proposed for the solar panel drainage. Excavated materials would be used to either create the required profiles of the infrastructure, or the landscaping profile between the new infrastructure and existing ground, or temporary hardstandings. Further details are provided in **ES Volume III, Appendix 6.2: Flood Consequence Assessment and Surface Water Drainage Statement**.

- 2.6.49 Ffordd Y- Gyfraith adopted highway, which passes through the Site, would be used for connectivity between turbine locations and solar parcels. To accommodate the ALLs localised overrun areas would be constructed, as shown in **ES Volume IV, Figure 2.17: Highway Overrun Areas**. Where these fall within the adopted highway, the overrun areas would – if necessary – be subject to a S278 agreement with the Highways Authority.

Construction of Temporary Compounds

- 2.6.50 The construction compound would be formed by stripping organic and soft surface material and laying geotextile and crushed rock to create a firm level regular surface. Construction drainage features would be formed and installed at the same time as the construction compounds.

Construction of Substation and Control Building Compound

- 2.6.51 The foundation of the substation and control building compound would be subject to investigation before construction; however, the assessment has assumed reinforced concrete strip foundations at a minimum depth of 1.25 m below ground level and some cut and fill excavation would be required to create a level platform. A balance of material would be sourced from on-site reducing the amount of import/export of material.
- 2.6.52 The ground floor of the control building would be a ground bearing slab and would incorporate ducts and trenches for the laying of power export cables. Fencing would be installed around the perimeter of the compound and CCTV would be installed within the compound as required (3.6 m in height).

Construction of Turbine Foundations and Crane Pad Hardstandings

- 2.6.53 Construction of turbine foundations, crane hardstandings and laydown/storage areas would require the cut and fill excavation of surface organic and soft surface material and potentially underlying bedrock. Each location will be subject to further investigation prior to construction, but for each turbine foundations this would be down to a competent subsoil or the underlying bedrock. A balance of material would be sourced on-site, reducing the amount of import/export of material. The excavated material may be used to partially backfill the excavation and provide material for landscaping and surfacing reinstatement. It would be stored near to the excavation until required, with topsoil and subsoil stored separately. The formation level for the foundation of each turbine would be levelled to provide a workable platform for the assembly of reinforcing steel bars and formwork used to contain the poured concrete. Concrete for the foundations would be delivered to the Proposed Development in a “ready mix” form.
- 2.6.54 During construction, excavations may need to be drained (for example, if rainwater gets into construction areas). Suitable filtration systems would be employed to ensure that silt laden water does not contaminate surface watercourses and that extracted water is treated to remove silt before being returned to the surrounding area with a limited effect on local hydrology. The excavated area around the turbine would then be back filled with selected excavated material to the required design levels.

Construction of Solar PV Panels, Frames, Inverters and Transformers

- 2.6.55 The Solar PV panels are arranged on mounting frames of varying widths depending on the topography of the ground. The frame is supported at either end by galvanised steel or anodised aluminium poles driven into the ground to a depth of between 1 and 2 m.
- 2.6.56 The Solar PV panels could also be mounted through the use of a shallow tripod foundation design, or ground mounted on concrete blocks (shoes), with cabling contained in troughs rather than trenches, which would limit ground intrusion should that be considered necessary following further post consent investigations.
- 2.6.57 The Solar PV Inverters are small units that fix onto the rear of the mounting frames periodically throughout the array.
- 2.6.58 The Solar PV Transformers would arrive at site as a prefabricated unit and installed onto a concrete plinth or stone base within the solar array.

Cable Installation

- 2.6.59 Detailed construction and trenching specifications for the underground cabling will depend on ground conditions encountered. Power export cables would be laid within a sand or granular bedding to prevent damage to the power export cables from sharp stones (with ducting is required for track crossings). Trenches would be backfilled with excavated material and the surface redressed to match the existing ground. If sand bedding is used, clay bunds will be placed at intervals within the bedding to prevent unnatural flows of ground water.

Site Reinstatement

General Approach

- 2.6.60 Following construction, areas of the Site subject to disturbance will be reinstated as soon as is practicable by the Contractor (including reinstating sections of track verges as construction phases progress). The anticipated type and extent of reinstatement is outlined below:
- Where a re-turfing method is appropriate, such as along track verges, the surface layer of soil and vegetation will be stripped and stored separately from the lower soil layers and replaced as intact as possible;
 - Local reinstatement will be carried out to retain the structure and composition of the original plant communities, as well as forming a stable area over reformed ground, thus reducing erosion by rain, run-off, and wind; and
 - Bare soil areas will be allowed to revegetate naturally in combination with reseeded using a low-density seed mix which mirrors local vegetation to help bind the soil more quickly.

Site Access Tracks

- 2.6.61 Site access tracks are required throughout the operational phase of the Proposed Development to permit access for maintenance and repair operations. They will also allow access during the decommissioning phase.

- 2.6.62 Generally, the sloping verges of access tracks will be re-seeded with locally occurring species, with top-soil reuse and/or turf replacement to blend in with the surroundings. Measures such as grass-reinforcement may be applied where the track widens on steeper bends and in passing places if suitable material is generated during the construction of the track. The adjacent grassland will be allowed to extend across the edges and middle of the tracks, reducing the extent of the visibility of tracks in the landscape. The engineered appearance of any embankments will be smoothed out to ensure any landforms form safe slopes and blend in with topography.
- 2.6.63 Hedgerows will be proposed to replace those lost as a result of the construction of the Site access track, including new hedgerow planting and hedgerow trees (in locations which will not interfere with the safe passage of turbine components).

Turbine Foundations and Crane Pad Hardstandings

- 2.6.64 Turbine foundations will be capped with soil material and re-turfed with the removed material. Where vegetation is sparse or unlikely to regenerate, reseedling with an appropriate local seed mix may be undertaken as outlined above. The condition of turfs will be monitored regularly during the first few months following reinstatement. If necessary, water will be imported to the Site to ensure the re-establishment of this vegetation.
- 2.6.65 Hardstanding areas at each turbine location will be retained for use during operation and decommissioning. Edges will, as far as possible, be blended from the perimeter of the hardstanding to provide a safe slope from the finished hardstanding surface to the original ground level adjacent to new infrastructure. Natural vegetation will be allowed to re-establish.

Temporary Construction Compounds

- 2.6.66 The temporary construction compounds will be removed and the ground restored to its original condition once construction is complete, and the Proposed Development is operational.

Environmental Management during the Construction Phase

Construction Environmental Management Plan

- 2.6.67 To support this DNS application, an Outline Construction Environmental Management Plan (OCEMP) has been prepared and has been informed by the information in this ES. This is provided in **ES Volume III, Appendix 2.1: Outline Construction Environmental Management Plan**.
- 2.6.68 The main objective of an OCEMP is to set out a framework for how construction works would be managed to avoid or mitigate adverse environmental impacts. An OCEMP provides a mechanism for implementing measures to reduce potentially adverse impacts to the environment insofar as reasonably practicable.
- 2.6.69 It is the intention that a condition of planning permission would include the refinement and approval of the OCEMP by the appointed Contractor to create a

detailed CEMP. The detailed CEMP would then be a live document on-site for use throughout the construction phase.

Soil Management Plan

- 2.6.70 **ES Volume III, Appendix 5.4: Outline Soil Management Plan** presents measures that shall be employed during construction and decommissioning in order to minimise and mitigate the impacts the Proposed Development may have on soils including measures to deliver successful restoration of soils at the end of the construction phase.
- 2.6.71 These measures aim to preserve the structure and function of the soils within the Site. Construction will be planned to maximise works when soils are not too wet or saturated wherever possible. Soils will be handled when dry where possible or if stockpiling when wet is necessary, a period of drying and reparation will be required until the soil is suitable for reinstatement.
- 2.6.72 Areas where soil is to be removed, stockpile locations and haul routes shall be clearly defined prior to work commencing, and no trafficking of vehicles/ plant shall occur outside of these routes so as to minimise the extent of damage to soils.
- 2.6.73 More information on soil handling principles, pre-construction site preparation, soil stripping techniques, Stockpiling and the reinstatement of soils is provided in **ES Volume III, Appendix 5.4: Outline Soil Management Plan**.

Avoiding Statutory Nuisance

- 2.6.74 Localised dust emissions during construction would be controlled by the adoption of construction best practices.
- 2.6.75 To minimise potential noise and vibration effects, all works would be undertaken in accordance with best practicable means as set out further in **ES Volume II, Chapter 9: Noise and Vibration**.
- 2.6.76 A sensitive lighting scheme would be implemented during the construction phase. This would limit the lighting to that which is required for safety and security purposes. All lighting would be orientated into the Site to avoid light spill, and to minimise potential effects on nearby residential and ecological receptors.
- 2.6.77 Wheel washing facilities would be provided at the main northern Site entrance during construction (given that the southern access point would be an entrance only) and regular inspections of the areas of the adopted highway Ffordd-y-Gyfraith, being utilised for connectivity between turbines, would be undertaken and where necessary road cleaning undertaken.
- 2.6.78 Further details are provided in the OCEMP provided in **ES Volume III, Appendix 2.1: Outline Construction Environmental Management Plan**.

Materials Sourcing and Waste Management

- 2.6.79 Construction of the Proposed Development would require a range of materials, details of which are provided in this chapter. Stockpiling of materials would be kept to a minimum and materials would only be stockpiled within the temporary construction compound and these stockpiles would be kept to the minimum required to manage the construction activities. Excavated material from the turbine foundations and access tracks would be re-used where practical on-site for creating the required levels for the infrastructure and restoration/reinstatement. Further details are provided within **ES Volume III, Appendix 2.1: Outline Construction Environmental Management Plan** and **ES Volume III, Appendix 5.4: Outline Soil Management Plan**.
- 2.6.80 On-site concrete batching would not take place and ready mixed concrete would be delivered to Site. This method has been adopted in order to avoid the environmental impacts associated with having borrow pits on site.
- 2.6.81 A Site Waste Management Plan (SWMP) and Materials Management Plan (MMP) would be developed by the main Contractor for implementation during construction. This would outline details of the requirements for materials and waste management during construction. Materials on site would be ordered and managed in such a way to minimise waste where possible. All materials will be identified, classified, quantified and, where practicable, appropriately segregated. Any material that cannot be reused will be disposed of accordingly. Waste will be transferred using a registered waste carrier to a licensed waste disposal site or recycling centre.

Arboricultural Management

- 2.6.82 An Arboricultural Impact Assessment (AIA) has examined the potential impact of the construction on surveyed trees, tree groups, and hedgerows within the Site. This is provided in **ES Volume III, Appendix 2.2: Arboricultural Impact Assessment**.
- 2.6.83 The Principal Contractor would have the responsibility to ensure that all works near retained trees are undertaken in accordance with appropriate tree protection measures. Where works are required in proximity to retained trees, construction exclusion zone barriers would be erected in accordance with BS 5837 (2012) – Trees in Relation to Design, Demolition and Construction (The British Standards Institution, 2012).

2.7 Operational Phase

- 2.7.1 The expected operational life of the Proposed Development is 50 years from the date of commissioning. At the end of this period, the Proposed Development would be decommissioned, above ground equipment removed and the Site restored. Any alternative to this would require further planning application(s).

Operational Workforce

- 2.7.2 A team of several staff including engineer fitters would supervise the operation of the Proposed Development and would visit the Site to conduct routine maintenance. The frequency of these visits would depend on the turbine manufacturer.

Operation and Maintenance

- 2.7.3 The proposed operational life of the Proposed Development is 50 years from the date of commissioning. Individual turbines, and the solar panels will run automatically under the control of their own integral computer-based control system, and performance will be monitored remotely. If a fault is detected on any of the monitoring systems, the system will generate an alarm which will be sent to the maintenance operator and, if required, the equipment will be automatically switched off.
- 2.7.4 Maintenance work during the operational life would involve a team of technicians visiting the Site regularly to undertake scheduled maintenance and operational checks to ensure the Proposed Development is operating to maximise generation and maintain its operational capacity. Typical maintenance work would include the following:
- Scheduled routine maintenance and servicing, usually conducted at least bi-annually, which will involve the undertaking of non-essential repairs on gearboxes and generators;
 - High voltage and other electrical maintenance;
 - Blade inspections; and
 - Any necessary routine civil maintenance of tracks, drainage and buildings.
- 2.7.5 During the life of the Proposed Development, some solar panels, inverters, frames, piles and transformers may need to be replaced. It is anticipated that any replacement of this infrastructure would be undertaken on an ad-hoc basis (a conservative assumption is up to 25 % at a given time). The replaced solar infrastructure would be recycled to reduce waste generation and undue pressure on waste management infrastructure.
- 2.7.6 The operational phase of the Proposed Development is unlikely to generate significant amounts of waste which requires disposal at landfill. Minor quantities of waste material would be collected during routine maintenance inspections. Routine waste streams during this phase include relatively small quantities of municipal waste, waste chemicals, oils, and sewage. Measures will be put in place to ensure waste generated from the Proposed Development is kept to a minimum and does not have a significant cumulative effect on local waste management infrastructure. All wastes arising as a result of servicing and maintenance (e.g. lubricating oils, cooling oils, packaging from spare parts or equipment, unused paint etc.) would be removed from the Site and reused, recycled or disposed of in accordance with best practice.
- 2.7.7 Renewable energy developments are designed to operate largely unattended. Each turbine would be fitted with an automatic system designed to supervise and control a number of parameters to ensure proper performance (e.g. start-up, shut-down, rotor direction, blade angles etc.) and to monitor condition (e.g. generator temperature). The control system would automatically shut the turbine down should the need arise.

- 2.7.8 As noted in **paragraph 2.5.30**, the Proposed Development would have a sophisticated overall SCADA that would continually interrogate each of the turbines and the high voltage connection. An operator would be employed to operate and maintain the turbines, largely through remote routine interrogation of the SCADA system. The operator would also look after the day-to-day logistical supervision of the Proposed Development and would be on-site intermittently.
- 2.7.9 In the case of any fault, including over-speed of the blades, overpower production, or loss of grid connection, the turbines shut down automatically through integrated braking mechanisms. They are also fitted with vibration sensors so that, if, in the unlikely event a blade was damaged, the turbines would again be automatically shut down.
- 2.7.10 For the solar PV modules, data cables (typically fibre optic) would be installed, typically alongside electrical cables in order to allow for monitoring during operation and maintenance, such as the collection of solar data from devices known as pyranometers for solar PVs. The solar PV modules would also include cleaning maintenance throughout operation.

Meteorological Effects

- 2.7.11 Turbines, like any tall structure, can be susceptible to lightning strike and appropriate measures are included in the turbine design to conduct lightning strike down to earth and minimise the risk of damage to the structure. In the case of a lightning strike on a turbine or blade, the turbine would be automatically shut down.
- 2.7.12 In cold weather, ice can build up on blade surfaces when operating. The turbines can continue to operate with a thin accumulation of snow or ice but would be shut down automatically when there is a sufficient build up to cause aerodynamic or physical imbalance of the rotor assembly. Many models now include de-icing technology.
- 2.7.13 Solar PVs are less susceptible due to their heights, mounting and orientation. Installed monitoring systems would alert to any faults occurring.

Track and Access Maintenance

- 2.7.14 Once the Proposed Development is operational, the volume of traffic using the access tracks would be low. Correspondingly, the need for any track maintenance works is anticipated to be low and infrequent. Any such works required would generally be undertaken during the drier conditions in the summer months.
- 2.7.15 Regular maintenance would be undertaken to keep the Site access track drainage systems fully operational and the road surface in good condition and to ensure there are no adverse issues affecting the public road network.

2.8 Decommissioning

- 2.8.1 At the end of the operational period, the Proposed Development would be decommissioned.

- 2.8.2 Decommissioning activities and sequence are envisaged to be broadly the reverse of the construction activities and would utilise similar equipment and personnel. Activities would likely take place in a shorter overall duration (approximately 6 to 12 months) and would involve the following stages:
- Dismantling and removal of wind turbines, PVs and electrical equipment; and
 - Restoration of the turbine hardstandings and substation.
- 2.8.3 Turbine components would need to be dismantled and removed in a similar fashion to their delivery and erection. Cranes would be used to split the turbines into sections which would then be transported from the site by HGVs. These components would be reused, recycled or if appropriate disposed of in accordance with the relevant waste management regulations at the time.
- 2.8.4 The plinth and the top surface of the wind turbine foundations would be broken out to a depth of 1 m from the surface, and all cabling would be cut out at the same depth with the remaining concrete. Once the broken-out concrete has been removed, the area would be reinstated with a final layer backfilled with soil to an agreed method statement, as outlined in the restoration section above.
- 2.8.5 The high voltage and SCADA power export cables would be cut off below ground level but would generally be left in place to avoid unnecessary ground disturbance.
- 2.8.6 Tracks and hardstandings can become amenities for the landowners use over the duration of the project. It is therefore proposed that these would be left in situ for use by the landowner or covered in topsoil. No stone is proposed to be removed from the Site during decommissioning. This approach is considered to be less environmentally damaging than seeking to remove all track foundations, underground power export cables and tracks entirely.
- 2.8.7 A Decommissioning Strategy would be submitted by the Applicant for agreement with BCBC and NPTC, as the Local Planning Authorities, prior to the decommissioning works taking place, and this is likely to be subject to an appropriately worded condition on any planning permission. As part of the Decommissioning Strategy, a Buried Cable Risk Assessment will be undertaken to assess the risks associated with the cables being left in place (as set out in **paragraph 2.8.5**). A Decommissioning Environmental Management Plan (DEMP) would perform a similar role to the CEMP for the construction phase and set out the mitigation measures to be implemented throughout the works.
- 2.8.8 During the decommissioning phase of the Proposed Development wastes may include demolition waste (steel, crushed concretes and other building materials), broken down turbine components (steel and fibreglass), electrical cabling as well as municipal waste, waste chemicals, fuel and oil, sewage, and polluted water containing silt or hydrocarbons. The Principal Contractor would carry out works in a way, as far as reasonably practicable, minimises the quantity of waste and spoil to be disposed of.

- 2.8.9 Currently between 85 – 95 % of a wind turbine can be recycled. However, there are now a number of R&D projects and programmes underway² which aim to increase the recyclability of wind turbine components. In addition, up to 99 % of materials in a solar PV module are recyclable, with organisations around the UK specialising in solar panel recycling in line with the Waste Electrical and Electrical Equipment Regulations 2013.
- 2.8.10 Any waste arisings would be categorised and removed from the Site by an appropriately licenced waste carrier with strict adherence to appropriate legislation.

2.9 Embedded (Primary) Mitigation and Enhancement

Embedded (Primary) Mitigation

- 2.9.1 Through the iterative design process, proposed ‘embedded’ (environmental design) mitigation measures have been included within the design and therefore are considered to be an inherent part of the Proposed Development i.e., the project design principles adopted to avoid or prevent adverse environmental effects.
- 2.9.2 The embedded (primary) mitigation measures relevant to a particular factor are identified within each environmental factor assessment chapter. These embedded (primary) mitigation measures should not be confused with additional (secondary and tertiary) mitigation proposed in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment.

Enhancement

- 2.9.3 Enhancement measures have been directly incorporated into the Proposed Development as part of the application of ‘good design’ principles. Enhancements are measures that are considered to be over and above any mitigation measures to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects of the Proposed Development.
- 2.9.4 In addition to consideration and management of environmental impacts, in accordance with the requirements of PPW12, the design has implemented the step-wise approach to avoid or minimise impact on biodiversity and adopted the DECCA Framework to seek biodiversity enhancement on Site. The approach and recommendations are provided in **ES Volume III, Appendix 10.4: Net Benefit for Biodiversity Report**.

2.10 References

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3 ENVIRONMENTAL CONTEXT AND REASONABLE ALTERNATIVES CONSIDERED

3.1 Introduction

- 3.1.1 This chapter provides a brief description of the location of the Site, its features and its existing land uses. It also includes a description of the surrounding area and its environmental context, in particular, the sensitive receptors that could be affected by construction, operational and/or the decommissioning phases of the Proposed Development.
- 3.1.2 There are several sensitive receptors that have been identified as relevant to the Proposed Development, and these have been taken into consideration within the assessments presented in **ES Volume II, Chapters 5 to 14** and the iterative design process which is discussed within this chapter.
- 3.1.3 Schedule 4(2) of the EIA Regulations 2017 states that an ES should include:

“a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the applicant or appellant which are relevant to the proposed development and its specific characteristics and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”
- 3.1.4 This chapter recognises and fulfils this requirement in respect of the Proposed Development and describes the main alternatives to the Proposed Development, that have been considered by the Applicant, together with the principal reasons for proceeding with the Proposed Development.
- 3.1.5 The consideration of alternatives and design evolution has been undertaken with the aim of avoiding, preventing, reducing, or, if possible, offsetting likely significant adverse environmental effects (following the mitigation hierarchy), while ensuring operational efficiency of the renewable energy park, cost effectiveness, and other relevant matters such as existing land use and planning policy. The design of the Proposed Development has evolved through engineering design work, in response to consultation feedback, and environmental survey work.

3.2 Site Location

- 3.2.1 The Site comprises an area of approximately 578 hectares (ha) within South Wales. It is predominantly situated within the administrative boundary of BCBC, with the exception of the western portion of the Site (approximately 25 ha) which falls within the boundary of NPTC. The Site location and DNS application boundary are illustrated in **ES Volume IV, Figure 1.1: Site Context** and **ES Volume IV, Figure 1.2: Planning Application Boundary**, respectively.

- 3.2.2 The Site extends northwards from New Road towards Llangynwyd, west of the A4063 and across an area of elevated land approximately 7 km north of the Welsh coast.

3.3 Site Description

Current Land Use

- 3.3.1 The Site is predominantly undeveloped and agricultural in use, specifically for pastoral farming. Four residential properties and their associated farmsteads are dispersed across the Site. There is one farm-scale wind turbines operating within the Site at Cwm Risca Farm, which is less than 30 m in height and will remain in situ.

Landform and Topography

- 3.3.2 The Site comprises predominately grassland that is actively grazed by sheep and cows, with areas mown for silage and areas of arable land. Across the Site there are areas of woodland (broad-leaved, coniferous and mixed), scrub, marsh and swamp.
- 3.3.3 The topography of the Site falls in multiple directions from localised high points. Mynydd Baeden is a high point located in the southern extent of the Site, at a level of approximately 250 m above ordnance datum (AOD). Mynydd Ty-talwyn is the second localised high point on-site, located within the centre of the Site at a level of approximately 232 m AOD.

Access

- 3.3.4 The main access to the Site is from Maesteg Road, located northeast of the Site and New Road to the south. The C-Class Road known as Ffordd-y-Gyfraith roughly dissects the Site in a south-east to north-west direction. This road will provide connectivity across the Proposed Development.
- 3.3.5 There are 22 PRow within the Site:
- Public Footpaths (FP):
 - Llangynwyd Lower (LDL) – FP 3, 4, 5, 8, 9, 10, 11, 12, 13 and 14;
 - Llangynwyd Middle (LDM) – FP 4, 5, 6, 7, 21, 22, 23, 24, 25 and 41; and
 - Neath Port Talbot – 9/64.PT/3.
 - Bridleway (5 Llangynwyd Middle (BW 5 LDM)).
- 3.3.6 Some of these paths are routes that are actively promoted to encourage use of these paths for leisure opportunities, including the Ogwr Ridgeway Walk, which runs in an east to west direction across the Site.
- 3.3.7 There are also four Definitive Map Modification Orders (DMMOs) within the Site, as identified by BCBC:
- A763/1/217 – Upgrade FP 5 LDL to a Restricted Byway and modify the Definitive Statement;

- A763/1/218 – Upgrade FP 12 LDL to a Restricted Byway and add a Byway Open to All Traffic (BOAT) from Cwmrisca Cross;
- A763/1/219 – Upgrade FP 4 LDL to a Restricted Byway and modify the Definitive Statement; and
- A763/1/272 - add a Bridleway Leading from the Junction of Heol Moch and County Road to Bridleway 17, Llangynwyd Middle, at the County Boundary, and from Bridleway 17 to Junction of Footpaths 2 and 55, Maesteg.

3.3.8 A map showing the PRowS and bridleway within the Site are presented in **ES Volume IV, Figure 13.1: Public Rights of Way**. The DMMOs are presented on a map in **ES Volume III, Appendix 1.2: Scoping Direction**.

3.3.9 The National Cycle Network (NCN) Route 4 (Cefn Cribwr to Bridgend) runs east to west within 210 m of the southern boundary at its closest point. The location of this route in the context of the Site is also presented in **ES Volume IV, Figure 13.1: Public Rights of Way**.

3.4 Environmental Characteristics

3.4.1 Key environmental features are presented in **ES Volume IV, Figure 3.1: Environmental Features** and summarised below, with further detail available in **ES Volume II, Chapters 5 to 14**.

Landscape Designations

3.4.2 The Site is not located within any nationally or locally designated landscapes. The closest nationally designated landscape is the Bannau Brycheiniog (Brecon Beacons) National Park approximately 21.5 km to the north of the Site.

3.4.3 The Site is located within the Western Uplands Special Landscape Area (SLA) as set out in the Bridgend County Borough Local Development Plan (2018 – 2033) and Margam SLA, as set out within the Neath Port Talbot Local Plan (2011-2026).

Statutory and Non-Statutory Ecological Designations

3.4.4 There are three statutory international designated sites within a 10 km radius of the Site:

- Glaswelltiroedd Cefn Cribwr/Cefn Cribwr Grasslands Special Area of Conservation (SAC), located approximately 1 km to the south of the Site;
- Blackmill Woodlands SAC, located approximately 3.5 km to the east of the Site; and
- Cynffig/Kenfig SAC, located approximately 5.2 km to the south west of the Site.

3.4.5 There are six nationally statutory designated sites within 2 km of the Site. The closest of which is the Cwm Risca Meadow Site of Special Scientific Interest (SSSI) which is located to the immediate south of the Site and is designated as an old wet acidic meadow which supports over 80 species of plants and a colony of Marsh Fritillary butterfly. The remaining five national ecological designations are:

- Bryn-Bach Cefn Cribwr SSSI, located approximately 1 km to the south of the Site;

- Caeau Cefn Cribwr SSSI, located approximately 1.3 km to the south of the Site;
- Bedford Park Local Nature Reserve (LNR), located approximately 1.3 km to the south of the Site;
- Waun Cimla SSSI, located approximately 1.7 km to the south of the Site; and
- Cwm Du Woodlands SSSI, located approximately 1.7 km to the south of the Site.

3.4.6 There are 27 non-statutory designated sites within 2 km of the Site and four within the Site:

- NPT Watercourses Site of Importance for Nature Conservation (SINC): All NPT watercourses are designated as SINC;
- Cwm Nant Gwyn SINC: Broad-leaved semi-natural woodland;
- Nant Cwm-bach SINC: Broad-leaved semi-natural woodland, coniferous plantation, marsh/marshy grassland; and
- Gilfach Uchaf SINC: Marsh/marshy grassland, semi-improved acid grassland, acid dry dwarf shrub heath, natural acid/neutral rock exposure.

Natural Resources

3.4.7 Towards the north of the Site, there is a watercourse known as Nant y Gadlys, which conveys flow north and is a tributary of Afon Llynfi. There are two small watercourses in the southern extent of the Site: Nant-y-gedd and an unnamed watercourse which both convey flow south. Nant Craigraber, runs through Craig-Y-Aber woodland (outside the Site), with the Proposed Development to the west and east.

3.4.8 The Site is predominantly located within Flood Zone 1, with small sections of Flood Zones 2 and 3, coinciding with the downstream extent of Nant Craigraber and partly along the route of Nant Fadog. These Flood Zones are mainly contained within the immediate vicinity of the watercourses themselves.

3.4.9 The Site is not located in a Source Protection Zone (SPZ) with respect to a groundwater abstraction source. There are no records of private water supplies (wells) on the Site.

3.4.10 The majority of the Site has no peat soils present. There is one small area within the Site where peat is present (recorded at a depth greater than 1 m), but no development infrastructure is proposed in that location.

Historic Environment

3.4.11 There are four Scheduled Monuments located within the Site:

- Earthwork & Platform Houses N of Nant Fadog;
- Mynydd Ty Talwyn Ancient Farms (West);
- Mynydd Ty Talwyn Ancient Farms (East); and
- British Fortified Residence.

3.4.12 There are also a number of recorded Prehistoric and Roman, Medieval, Post-Medieval and Modern assets within the Site.

3.5 Alternative Sites/Locations

Introduction

- 3.5.1 The Applicant has a well-established process for selecting sites and identifying land for renewable energy park development. The process and approach to selecting and approving sites for renewable energy development involves ensuring early assessment of potential capacity for energy generation in balance with environmental and technical constraints, relevant policy, and project deliverability in line with the urgency of reaching 2050 net zero targets for Wales.
- 3.5.2 The EIA Regulations 2017 do not require developers to consider alternative sites for a specific development. Only those “*reasonable alternative studied by the developer*” need be addressed in the EIA. A site sieving exercise was undertaken by the Applicant to consider appropriate locations in proximity to an available grid connection. The Site was subject to an initial high-level appraisal to understand its potential suitability for a renewable energy park, considering issues such as land use planning designations, environmental designations and technical constraints. Following that initial exercise, a more detailed and iterative design process was adopted informed by baseline surveys, consultees responses/comments and the professional input of the design team.

Planning Policy Framework Considerations

- 3.5.3 As set out in **ES Volume II, Chapter 2: Proposed Development Description**, Future Wales: The National Plan 2040 provides a framework for planning change and development and has development plan status. Policy 17 of the National Plan 2040 identifies ten “Pre Assessed Areas for Wind Energy” in which there is a presumption in favour of largescale wind energy development, subject to the criteria in Policy 18. The Site is located outside of Pre-Assessed Area 9, but lies within 1.75 km at its closest point. The National Plan 2040 notes that “*Outside of these areas a positive policy framework still exists, subject to policy 18*”. The Policy 18 criteria is replicated below:
- 1) Outside of the Pre-Assessed Areas for wind developments and everywhere for all other technologies, the proposal does not have an unacceptable adverse impact on the surrounding landscape (particularly on the setting of National Parks and Areas of Outstanding Natural Beauty);
 - 2) There are no unacceptable adverse visual impacts on nearby communities and individual dwellings;
 - 3) There are no adverse effects on the integrity of Internationally designated sites (including National Site Network sites and Ramsar sites) and the features for which they have been designated (unless there are no alternative solutions, Imperative Reasons of Overriding Public Interest (IROPI) and appropriate compensatory measures have been secured);
 - 4) There are no unacceptable adverse impacts on national statutory designated sites for nature conservation (and the features for which they have been designated), protected habitats and species;
 - 5) The proposal includes biodiversity enhancement measures to provide a net benefit for biodiversity;

- 6) There are no unacceptable adverse impacts on statutorily protected built heritage assets;
- 7) There are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance;
- 8) There are no unacceptable impacts on the operations of defence facilities and operations (including aviation and radar) or the Mid Wales Low Flying Tactical Training Area (TTA-7T);
- 9) There are no unacceptable adverse impacts on the transport network through the transportation of components or source fuels during its construction and/or ongoing operation;
- 10) The proposal includes consideration of the materials needed or generated by the development to ensure the sustainable use and management of resources;
- 11) There are acceptable provisions relating to the decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration; and
- 12) Cumulative impacts of existing and consented renewable energy schemes should also be considered.

3.5.4 The above criteria have been considered throughout site selection and the design development process.

Site Selection Process

3.5.5 The overall approach to renewable energy park site selection is to identify areas of land where the siting of a renewable energy park would result in acceptable environmental effects, align with planning and renewable energy policy, be free from overriding technical constraints, and be economically viable. This initial site identification exercise involves:

- A review of current and emerging planning policy (at the National and Local level);
- Geographical Information System (GIS) constraints analysis;
- A review of suitable site access points, grid viability and transportation issues;
- Consideration of wind speeds and terrain characteristics, to understand whether these will be sufficient for optimal operation of wind turbines;
- Desk-based assessment of site technical and environmental constraints;
- Ground conditions for building of turbine foundations, access tracks and associated electrical infrastructure; and
- Ability for extant land use to be maintained as much as possible alongside the simultaneous operation of wind turbines, e.g. grazing land.

GIS Constraints Analysis

3.5.6 The GIS constraints analysis involves identifying and mapping environmental, technical, and engineering constraints to renewable energy park development. Constraints that were considered as part of the Applicant's Site selection exercise included:

- Aviation interests: Including local licensed aerodromes and visibility to radars, both military and civilian;

- Landscape designations: Including National Parks and local landscape designations;
- Ecological designations: Including International designations (e.g. Special Protection Areas), National designations (e.g. Sites of Special Scientific Interest), and Local designations (e.g. Local Nature Reserves);
- Cultural heritage designations: Including Registered Gardens and Designed Landscapes, Registered Battlefields, World Heritage Sites, Listed Buildings, Conservation Areas and Scheduled Ancient Monuments;
- The pattern of settlement and land use: with buffers provided around residential properties and settlements;
- Existing infrastructure: Including utilities, buildings, roads, wind turbines, and masts;
- Topography with slopes greater than 10 degrees;
- Other sensitive environmental receptors including PRow, peat, watercourses, woodlands, potential noise sensitive residential properties, potential mine entries and telecommunications links.

Suitable Access Considerations

- 3.5.7 Given the size and scale of AILs associated with renewable energy park developments, site selection also includes an appraisal of the Site's accessibility for construction traffic. The Applicant has undertaken an Abnormal Load Route Assessment and identified two access routes from the port of delivery to the Site which have been discussed with BCBC highways department. These routes are illustrated in **ES Volume IV, Figure 12.2: Abnormal Load Routes**.

Wind Speed Considerations

- 3.5.8 The predicted wind resource in any given location is an important consideration in identifying potentially suitable renewable energy park sites. The electricity that can be generated by a renewable energy park is directly linked to wind speed. Wind speed generally increases with height above ground level. The amount of electricity generated increases disproportionately with increases in wind speed, this in turn affects the carbon emission savings and the commercial viability of a site. Potential renewable energy park sites are therefore reviewed in relation to a number of publicly available data sources in the first instance, including the Numerical Objective Analysis of Boundary Layer wind speed database, solar irradiance and grid availability/proximity.

3.6 Design Strategy

- 3.6.1 The design strategy defines the overall approach to the design of the Proposed Development. It provides the starting point for the Proposed Development's design, and subsequent alterations to this design that were made in response to various considerations including landscape and visual amenity, cultural heritage, noise, ecological, ornithological, hydrological and geological constraints and effects, together with wind yield, solar irradiance, and feasibility of construction, as information emerged through the EIA process.

- 3.6.2 The overall aim of the design strategy was to create a renewable energy park with a cohesive design that is sympathetic in form and scale to the surrounding landscape context, whilst achieving an appropriate balance between maximising renewable energy yield and minimising other environmental and technical effects.

Design Objectives

- 3.6.3 The overarching objectives of the design strategy were as follows:
- To maximise the potential energy yield throughout the Site through the employment of wind and solar PV technology in optimal locations;
 - To use the latest wind turbine technology, consisting of more efficient and larger turbines where these can be reasonably accommodated within the landscape;
 - To ensure that turbines respond to the scale of the underlying landscape and operational, consented and proposed turbines in the surrounding context;
 - To develop a turbine layout which minimises adverse effects upon cultural heritage assets and their settings, including non-designated but locally important heritage assets;
 - To make use of natural and topographical screening of turbines and other infrastructure in key views where possible;
 - To ensure that no turbine is overbearing in views from any individual residential property;
 - To develop a turbine and solar PV layout that responds to the landscape context and minimises effects on cultural heritage assets and landscape views whilst avoiding areas of ecological importance;
 - To explore opportunities within the Site to restore and enhance biodiversity and provide greater access and recreational opportunities; and
 - To develop a layout that fulfils the above objectives whilst minimising or avoiding other environmental and technical constraints as far as possible, including noise, hydrology (watercourses), priority habitats, steep slopes, telecommunications links, and other technical constraints identified during the EIA process.
- 3.6.4 The main elements of the Proposed Development considered in the initial design iterations were the turbines and solar areas. The locations of other infrastructure components were largely dictated by the positioning of the turbines and were designed around on-site environmental constraints. Later iterations to the turbine layout involved minor alterations to turbine and infrastructure locations, which were reviewed against all constraints.

Site Sensitivities and Constraints

- 3.6.5 Constraints analysis was undertaken using GIS. A project-specific workspace, based on ArcGIS Online, was developed specifically for the Proposed Development. This allowed base-mapping to be overlaid with spatial data, such as environmental constraints and protected sites, and project-specific data to provide the Applicant with a means of interrogating environmental and project details in a single place at technical meetings and design workshops.

Wind Analysis

- 3.6.6 Wind analysis and efficiency modelling of the wind turbines has been carried out by the Applicant from project inception and throughout the design evolution process to identify the areas of the Site likely to produce the highest yields and ensure the commercial viability of the Proposed Development.
- 3.6.7 For turbines to work as effectively as possible, they must be suitably spaced relative to the predominant wind direction. If they are too close together in this direction, the wake effects from the wind turbines located on the upwind edge of the array would create turbulent air for the next row and so on through the array, reducing overall energy output. Additionally, turbulent air increases the strain placed on the turbines, which could shorten their operational lifespan. Conversely, if wind turbines are located too far apart, the opportunity to maximise the capacity and, thereby, electricity generation from a site is reduced.
- 3.6.8 There is no industry standard for spacing, only manufacturer recommendations, computer modelling and professional judgment. The turbines have a minimum turbine spacing of approximately 3.0 rotor diameters in any direction. This is understood to provide a reasonable compromise between turbine proximity and site capacity without unduly compromising turbine operation. The Proposed Development may, however, employ turbines which are not yet on the market, albeit these would be within the maximum parameters assessed. Therefore, a more flexible methodology utilising wind yield modelling was used to find the right balance of turbine efficiency and productivity over a wide variety of potential rotor diameters.

Heritage Assets

- 3.6.9 The heritage assets within the Site have been a key consideration throughout the design process. Heritage assets have been used as a “hard” restriction to development informing the layout design process.
- 3.6.10 Designated, and where possible non-designated, cultural heritage assets within the Site have been avoided by incorporating a 50 m buffer to offset new infrastructure from the assets. Consideration has also been given to the potential for setting impacts on above ground heritage assets looking towards and away from the Site.

Landscape Character and Visual Amenity

- 3.6.11 The landscape and visual environment of the Proposed Development has been a key consideration throughout the design process. Landscape and visual constraints do not generally constitute technical or “hard” restrictions to development but are rather “design considerations” that inform the layout design process. These considerations, many of which are key sensitive landscape and visual receptors, are found both on the Site and within the surrounding study area.
- 3.6.12 On-site considerations have included:
- The landform of the Site, in terms of its scale, elevation, and complexity; and
 - The topography of the Site, including the patterns of the landscape such as watercourses, field boundaries, and woodland.

3.6.13 Considerations within the wider study area have included:

- Effects on the landscape character and landform visible from the Scheduled Monuments (Llangynwyd Castle, Y Bwlwarcaw, Roman Camp, Camp N of Tonmawr, Camp 530 m E of Tonmawr and Pen-y-Castell Camp) and conservation areas (Llangynwyd); and
- Effects on the visual amenity from the Ogwr Ridgeway, users of the nearby A4063, those within the coastal landscape to the south-west, extending between Bridgend and Port Talbot and the settled areas in proximity to the Site.

3.6.14 **ES Volume II, Chapter 8: Landscape and Visual** describes the effects of the Proposed Development in relation to these considerations, and a range of viewpoints that represent the appearance of the Proposed Development from key landscape and visual receptors have been illustrated in **ES Volume III, Appendix 8.10: Visualisations Viewpoints 1 to 15** and described in the assessment.

Ecology and Ornithology

3.6.15 Ecological surveys have been carried out across the Site and surrounding area from 2023 to 2025, including a Phase 1 habitat survey, a national vegetation classification survey, great crested newt surveys, reptile survey, bat surveys, water vole and otter surveys, badger surveys, and a fungi survey. Sensitive and protected ecological features and appropriate buffers have been avoided. Sensitive habitats within the Site have been avoided where possible, or where unavoidable the potential or residual impacts reduced as far as practicable. Areas of priority habitat have been avoided where possible, and the recommended habitat standoff distances from blade swept path to key habitat features (triangulated 50 m) have been incorporated into the design to reduce collision risk to bats.

3.6.16 Ornithology surveys have been carried out across the Site and surrounding area since in 2022 and 2023 and refreshed, where needed, in 2024 and 2025. These surveys, include vantage point watches, scarce breeding birds (for raptors and divers listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and Annex 1 of the EU Birds Directive), nightjar surveys, breeding birds (waders, herons and waterfowl) and winter walkovers for non-breeding birds. Suitable buffers have been considered during the design evolution process.

3.6.17 **ES Volume II, Chapter 10: Terrestrial Ecology** and **ES Volume II, Chapter 11: Ornithology** describe the effects of the Proposed Development in relation to these considerations.

Telecommunications

3.6.18 Consultation was undertaken with the relevant telecommunication link operators, including The Joint Radio Company Ltd. (JRC), to inform the telecommunications links within the vicinity of the Site and to advise their position with respect to the Proposed Development. Microwave and NGE Ultra High Frequency (UHF) links have been avoided. Potential effects relating to telecommunications are discussed further in **ES Volume III, Appendix 4.8: Telecommunications Constraint Investigation**.

Aviation

- 3.6.19 Consultation was undertaken with the relevant aviation consultees to identify whether the Proposed Development would have an impact on aviation interests. Aviation is discussed further in **ES Volume III, Appendix 4.4: Aviation Technical Appendix**.

Other Considerations

- 3.6.20 A number of other technical and environmental constraints have been considered in the iterative design process, and have guided the positioning of both turbines, solar and infrastructure. These are outlined below:
- Residential properties: Maintaining a buffer (800 m where required) around residential properties to avoid breaching of any amenity thresholds;
 - Hydrology: Maintaining a 15 m buffer where possible from watercourses/ flood zones, and designing Site infrastructure to minimise the number and extent of new watercourse crossings;
 - Peat: Avoiding the small area of peat soil within the Site;
 - Topography: Avoiding steep slopes to ensure constructability and reducing the need for significant cut and fill engineering works; and
 - PRow: Avoiding PRow.

3.7 Alternative Designs

- 3.7.1 The following design alternatives have been considered during the evolving design process:
- Different turbine, solar PVs and infrastructure layouts/locations within the Site; and
 - Different access routes to and from the Proposed Development site in terms of delivery of AIL.
- 3.7.2 Over the course of the design process, the design and layout of the Proposed Development has been adapted and altered in response to environmental constraints and consultation feedback. The environmental features which constrain the Site are illustrated by **ES Volume IV, Figure 3.1: Environmental Features**. The Proposed Development went through a series of three design iterations. Each of these layouts is shown on **ES Volume IV, Figure 3.2: Design Iterations** and a summary of the layout iterations is included in **Section 3.8**.
- 3.7.3 As the design has evolved, the Applicant has carefully logged, mapped, and proactively managed (in line with the mitigation hierarchy) any site-specific considerations. The main considerations with regard to facilitating a detailed design assessment are presented in **Table 3.1**.

Table 3.1 List of Key Considerations which have Informed the Design Process

Area	Criteria	Description
Technical & Engineering	Access & connectivity	- Safe and practical access across the Site during all phase of the development. - Safe and well managed connectivity to local highway network.
	Constructability and timescales	Consideration of areas of peat, and interfaces with other infrastructure at the Site.
	Health and safety	- Maintaining safe working sites during construction, operation, and decommissioning. - Proximity to other live infrastructure (gas, water, and electricity). - Safe delivery of the Proposed Development when interacting with existing land uses.
	Availability, flexibility, and maintenance	- Ongoing engagement with landowners and stakeholders regarding use of the Site. - Ease of maintenance access across the Site.
	Operational efficiency	Turbine separation – maintaining sufficient separation between turbines.
Environmental	Geology and soils	Peat deposits: Avoiding areas classed as peat
	Hydrology	Proximity to watercourses and private water supplies: Maintaining 15 m setback.
	Protected habitats	Avoiding priority habitats identified on-site.
	Protected species	Avoiding direct/indirect impacts on species protected under Welsh or international law.
	Cultural Heritage	- Avoidance of direct impacts on designated cultural heritage assets - minimising impacts to potential archaeology. - Increase separation from known above ground heritage assets to reduce impacts on setting.
	Visual amenity	Proximity to residences: Maintaining sufficient distance from nearby properties (800 m where required).
	Noise	Proximity to residences: Maintaining sufficient distance from nearby properties.
	Access and recreation	Consideration of PRow.

3.8 Design Evolution and Development of the Preferred Option

3.8.1 The Proposed Development has undergone three principal iterations of the layout which have been developed at different stages in the project design process, as summarised below and subsequently described in more detail:

- **Layout A** – Scoping stage layout. A ten turbine layout with maximum height to blade tip of 230 m, and solar PV, informed by preliminary results of on-site surveys, desk-based assessments and consultant inputs. At this stage the Site size was approximately 814 ha. This Layout was used for scoping consultation.
- **Layout B** – A five turbine layout with maximum height 200 m and solar PV informed by landscape appraisal and telecommunication links. Access options from the North and South.
- **Layout C – Pre-Application Consultation Layout.** A six turbine layout with maximum height of 200 m, solar PV, informed by on-site surveys, consultation, further landscape assessment with further detailed ancillary infrastructure design including BESS and substation locations. The Site decreased in size to approximately 580 ha.
- **Layout D – Final Layout.** A six turbine layout with maximum height of 200 m. Removal of the BESS, removal and/or relocation of some solar PV fields, and relocation of the substation based on pre-application consultation feedback and further landscape and visual assessment and liaison. The Site decreased in size to approximately 578 ha.

Layout A – Scoping Stage Layout

3.8.2 The first design (Layout A) was developed prior to any detailed site-specific surveys being completed and with desk-based information on site constraints. The layout was based on information available at the time and collected from desktop studies and sought to make best use possible of the wind resource.

3.8.3 A ten turbine and solar layout was developed and assessed in **ES Volume III, Appendix 1.1: EIA Scoping Report** and was presented through a public consultation exercise. The layout attempted to optimise wind and solar generation capacity but avoid adverse effects on local dwellings, sensitive environmental receptors, aviation and radar receptors, existing infrastructure, engineering constraints, and land use features. Turbine height to blade tip was 230 m, which represented the maximum physical capacity of the turbine area from a wind resource perspective prior to the establishment of detailed constraints and a detailed wind resource assessment.

Layout B

3.8.4 The second design (Layout B) was developed following completion of detailed site-specific surveys, which refined the environmental baseline and key constraints and following consultation with technical specialists.

3.8.5 The locations of turbines were adjusted to reduce the amount of cut/fill earthworks and resulting disturbance to the ground, avoid utilities and maintain a 50 m buffer from all on site Scheduled Monuments. Turbine height to blade tip were dropped from 230 m to 200 m to reduce the visual effects on sensitive receptors.

- 3.8.6 Following consultation with the Joint Radio Company (JRC), turbines T01, T02 and T03 were removed from the proposal as they were located within Ultra High Frequency (UHF) and airwave link areas. Turbines T09 and T10 located within Craig-Y-Aber woodland were also removed as access could not be obtained for environmental surveys to be carried out in the area.
- 3.8.7 Solar and BESS/substation areas were further refined based on inputs from heritage, landscape and ecology consultants. Two options for the BESS and substation areas were identified.
- 3.8.8 In addition, foundation areas/hardstanding and crane hardstandings were added.

Layout C - Pre-Application Consultation (PAC) Layout

- 3.8.9 The third design (PAC Layout) represents the design iteration publicised during the pre-application consultation period.
- 3.8.10 The design changes incorporated into the PAC Layout comprise the following:
- A reduced Site boundary to remove Craig- Y-Aber Woodland, and areas to the north and south of the Site where no infrastructure will be located;
 - A balanced composition with limited opportunities for turbines to be viewed as “outliers”;
 - Turbine T03 (now renumbered as T01) was reintroduced following further consultation between the Joint Radio Company (JRC) and National Grid Electricity Distribution (NGED). It was confirmed that the present antenna on the telecoms mast was to be upgraded imminently which reduced the area affected by telecom links. Further details are located in **ES Volume III, Appendix 4.8: Telecommunications Constraint Investigation**;
 - The solar design was amended to accommodate for landscape and solar mitigation areas. A small parcel of solar to the south was dropped to avoid potential impact on great crested newts;
 - BESS/substation and construction compound areas were identified through further design work and consideration of the effects on heritage assets, landscape views and ecological habitats;
 - Tracks were added and avoid sensitive heritage assets. Internal track design developed through feedback with PRow offers, landscape, ecology and heritage consultants and discussions with the BCBC highways officer; and
 - Access revised to the northern and southern entrance for AILs and northern access for all other construction vehicles.

Layout D - Final Layout (Proposed Development)

- 3.8.11 The fourth design (Final Layout) represents the final stage of design iteration and constitutes the Proposed Development. This iteration includes the finalisation of turbine locations and siting and design of ancillary infrastructure.
- 3.8.12 The design changes incorporated into the Final Layout comprise the following:
- Minor relocation of turbine T06 to ensure that the turbine does not oversail the Site boundary;
 - The removal of solar fields to the north of the Ogwr Ridgeway Walk and the surrounding vegetation. This decision was made to reduce the visual effects

for users of the long-distance footpath when looking out from the Site and was reviewed in consultation with BCBC and their Landscape Representative;

- The removal of the BESS from the design, which has enabled the relocation of the substation. The substation was previously located to the north of the Ogwr Ridgeway Walk and has been relocated to the south of the route in a position broadly adjacent to turbine T04. The woodland block proposed surrounding the substation in the PAC Layout has therefore been removed. These changes help to retain the open views looking out from the Site for users of the footpath.
- Solar parcels in the centre of the Site have been redistributed to provide a wider buffer between the solar PV and proposed bird mitigation area. This redesign removes all energy infrastructure and woodland planting from the field which lapwing have previously been identified to nest within;
- The southern most solar parcel, near to the southern access, has been removed from the design following discussions between the Applicant and the landowner. This results in a minimum of a 110 m separation distance between Cwm Risca Meadow SSSI and built infrastructure; and
- Relocation of ecological mitigation area for birds following updated landowner discussion. The new location, which will co-exist with an area assigned for fungi mitigation, provides a similar level of mitigation and has been selected due to its similar terrain, suitable habitat type and proximity to existing nesting lapwing sites.
- Refinement to the proposed soft landscaping throughout the Site, in particular the woodland planting. These changes have evolved through consultation between BCBC's and NPTC's Landscape Representative and the Applicant's Landscape and Visual Impact Assessment, Ecology and Ornithology consultants. The woodland planting had previously sought to provide both visual screening of infrastructure and increase connectivity between existing woodland elsewhere within and adjacent to the Site for protected species (such as bats). Where woodland planting was proposed in the PAC layout to improve connectivity for ecological purposes, but was considered by BCBC's and NPTC's Landscape Representative to be incongruous with the existing landscape character, the woodland has been removed and replaced with boundary hedgerows to maintain vegetation connectivity. As set out above, where visual screening of infrastructure would no longer be required when compared to the PAC layout (e.g., around the removed solar parcels and former substation location), the associated woodland has also been removed.

3.8.13 The final layout of the Proposed Development subject to this DNS application, including ancillary infrastructure, is shown on **ES Volume IV, Figure 2.1: Proposed Development Layout**.

3.8.14 Individual environmental factor assessment chapters (**ES Volume II, Chapters 5 to 14**) refer to design input in further detail and respond to specific matters.

3.9 References

Bridgend Landscape Character Assessment (July 2013).

Neath Port Talbot Landscape Assessment (December 2004).

Replacement Bridgend Local Development Plan (2018 – 2033).

Neath Port Talbot Local Plan (2011 – 2026).

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Welsh Government. (2024). Planning Policy Wales Edition 12. Welsh Government. Available at: <https://www.gov.wales/planning-policy-wales>.

4 APPROACH TO THE EIA

4.1 Introduction and Context

- 4.1.1 This chapter outlines the approach to the EIA, in particular the objectives and overall strategy for the EIA developed by the Applicant.
- 4.1.2 The approach to consultation is also outlined in this chapter, together with the approach to proportionate assessment including the assessment criteria and the methodology for assessing cumulative effects.
- 4.1.3 The EIA has been undertaken in accordance with the EIA Regulations 2017, IEMA's 'Environmental Impact Assessment Guide to Shaping Quality Development' (2015), and guidance specific to the factors assessed (as listed in **ES Volume II, Chapters 5 to 14**).
- 4.1.4 A detailed overview of the Site's status in relation to relevant planning policy is discussed within **Planning, Design and Access Statement**, in addition to **ES Volume II, Chapters 5 to 14** which refer to any relevant planning policy which has informed the assessment methodology.
- 4.1.5 This chapter should be read in conjunction with the following appendices presented in **ES Volume III**:
- Appendix 4.1: High Level Grid Connection Assessment;
 - Appendix 4.2: High Level Abnormal Load Delivery Route Assessment;
 - Appendix 4.3: Air Quality Assessment;
 - Appendix 4.4: Aviation Technical Appendix;
 - Appendix 4.5: Wind Farm Aviation Lighting and Mitigation Technical Appendix;
 - Appendix 4.6: Solar Photovoltaic Glint and Glare Study;
 - Appendix 4.7: Shadow Flicker Impact Assessment;
 - Appendix 4.8: Telecommunications Constraint Investigation; and
 - Appendix 4.9: Long List of Other Developments.

4.2 Objectives of the EIA

- 4.2.1 The key objectives of the EIA are as follows:
- Set the legal framework;
 - Document the consultation process;
 - Consider the alternatives to the Proposed Development;
 - Establish baseline environmental conditions at the Site and within the surrounding area;
 - Identify, predict and assess the environmental effects associated with the Proposed Development: beneficial and adverse; permanent and temporary; direct and indirect and short/medium/long term; significant or not significant;

- Identify, predict and qualitatively assess the cumulative effects of the Proposed Development including those associated with other developments;
- Identify suitable mitigation measures to avoid, prevent, reduce or, if possible, offset likely significant adverse effects on the environment and identify the likely significant residual effects following the implementation of these measures; and
- Identify monitoring measures where likely significant residual adverse effects are identified.

4.2.2 Although not a requirement of the EIA Regulations 2017, opportunities for environmental enhancement have also been explored in this ES.

4.3 EIA Scoping

4.3.1 EIA Scoping is the process of identifying the content and extent of the environmental information to be included within an EIA based on the likely significant effects of a development. Scoping is undertaken at the start of the assessment in order to request feedback on proposed scope of the EIA. However, it is also an ongoing process, which is documented within this chapter alongside the evidence base associated with those factors/matters scoped out of further assessment.

4.3.2 As set out in **Section 1.2 of ES Volume II, Chapter 1: Introduction**, an EIA Scoping Report was submitted to PEDW on 27 November 2023 alongside a request for a formal Scoping Direction in accordance with Regulation 33(1) of the EIA Regulations 2017. As part of PEDW's responsibility under Regulation 33(7) of the EIA Regulations 2017, PEDW consulted with the following:

- Bridgend County Borough Council (BCBC);
- Neath Port Talbot County Borough Council (NPTC);
- Natural Resources Wales (NRW);
- Cadw;
- Soil, Peatland and Agricultural Land Use Planning Unit (LQAS), Welsh Government;
- Transport Directorate, Welsh Government;
- Defence Infrastructure Organisation (DIO);
- NATS;
- Civil Aviation Authority (CAA);
- The Coal Authority (CA);
- Health and Safety Executive (HSE);
- Mid and West Wales Fire and Rescue Authority (M&WW Fire and Rescue);
- South Wales Fire and Rescue Authority (SW Fire and Rescue); and
- Dŵr Cymru Welsh Water (DCWW)

4.3.3 PEDW also received additional submissions from Britain's Hidden History.

4.3.4 PEDW's Scoping Direction was received on 11 April 2024. This ES is based on the Scoping Direction received. **Table 4.1** summarises the key points of the Scoping Direction, together with how matters raised within the Scoping Direction have been addressed within this ES.

- 4.3.5 Where factors have been scoped in to the ES, further detail on how the matters raised within the Scoping Direction have been addressed is presented in the relevant environmental factor assessment chapters (**ES Volume II, Chapters 5 to 14**) and **Table 4.1**.

Table 4.1 Summary of the Scoping Direction

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
Grid connection	ID.1	The EIA Scoping Report states the route and specification of the grid connection are still subject to design and assessment, and that the grid connection will be subject to a separate consent application. The applicant's attention is drawn to comments from NPTC and BCBC, within which they highlight the requirement for the associated grid connection to be considered as part of the ES. PEDW states that the proposed grid connection routing options should be included in the ES with an assessment of the likely significant effects of the associated grid connection, including cumulative impacts.	A high-level assessment of the grid connection is provided in ES Volume III, Appendix 4.1: High Level Grid Connection Assessment .
Decommissioning	ID.2	The applicant's attention is drawn to LQAS's comments requesting a detailed scheme for site decommissioning. NRW and BCBC also refer to information required to assess the impact from the decommissioning phase. In line with comments received from BCBC, mitigations proposed in the decommissioning strategy should be shown to be deliverable in the long term at the end of the development's lifespan. PEDW advises that the ES should be based on a worst-case scenario and as decommissioning is part of the proposal (given that its expected lifespan is 50 years) decommissioning should be explored in a proportionate manner in the ES. At a minimum, the ES should clearly indicate how decommissioning of the site will take place, what will be left on site and	ES Volume II, Chapter 2: Proposed Development Description (Section 2.8) describes how decommissioning of the Site will take place, what will be left on-site and what will be removed. It also outlines the end-of-life cycle for the infrastructure on-site. Decommissioning has been assessed in ES Volume II, Chapters 5 to 14 where appropriate.

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		what will be removed. The ES should address what the end-of-life cycle will be for the infrastructure on site.	
Maintenance during operation	ID.3	The EIA should also consider the impact from any major maintenance during the operational phase. During the lifetime of the development, it may be the case that turbine blades, batteries or solar panels may need to be replaced. The impact of these major maintenance works does not appear to have been considered in the EIA Scoping Report. The applicant will need to consider what (if any) maintenance is likely to be required, the frequency of this maintenance and the impact from those activities. Currently there is inadequate information to support scoping this matter out. PEDW therefore advises that this matter should be scoped into the ES.	ES Volume II, Chapter 2: Proposed Development Description (Section 2.7) outlines the maintenance activities associated with the Proposed Development, including the requirement for the replacement of infrastructure. Maintenance activities have also been considered within all operational phase assessments in ES Volume II, Chapters 5 to 14 .
Policy	ID.4	The applicant's attention is drawn to detailed comments from BCBC regarding the recently adopted Replacement Bridgend Local Development Plan 2018 to 2033.	The recently adopted Replacement Bridgend Local Development Plan 2018 to 2033 has been referenced throughout the ES.
Operating capacity	ID.5	Whilst the EIA Scoping Report confirms that the combined installed capacity would be greater than 10 MW, it is not clear what the operating capacity of the each of the power generating elements would be. BCBC has requested a breakdown of the energy output for the solar farm and for each turbine in MW. The ES should clearly outline the anticipated installed generating capacity of each element.	ES Volume II, Chapter 2: Proposed Development Description (Section 2.4) outlines the anticipated combined installed capacity of the Proposed Development and breaks down each element.

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
Air quality	ID. 6	The EIA Scoping Report acknowledges the proposed access route for AIL deliveries falls within an Air Quality Management Area (AQMA). BCBC notes that potential impacts on air quality are likely to be most significant during construction and decommissioning phases. BCBC also notes that the potential use of borrow pits would need to be considered. There is the potential for the scheme to impact air quality at existing residential properties, particularly the Neath Port Talbot AQMA, as well as nearby sensitive designated ecological habitats. Due to the uncertainty on the levels of vehicle movements provided in the EIA Scoping Report for the construction and decommissioning phases, and the scale of the project, BCBC states that air quality cannot be scoped out at this stage. Further information is required on the volumes of construction traffic, including AIL movements, in order to inform an assessment that as to whether air quality can be scoped out. This assessment should be included in the ES. PEDW concurs with this direction and advises that air quality cannot be scoped out at this stage.	An Air Quality Assessment has been undertaken for the vehicle trips associated with the Proposed Development. This is provided in ES Volume III, Appendix 4.3: Air Quality Assessment and confirms that no significant air quality effects are anticipated. Therefore, air quality has not been scoped into the ES as a standalone assessment chapter. The decommissioning phase would result in fewer vehicle trips than the construction phase and therefore construction has been undertaken as a worst case assessment.
Aviation	ID. 7	NPTC and BCBC acknowledge that the applicant intends to consult Cardiff Airport, they advise that Ministry of Defence, Civil Aviation Authority, Swansea Airport and the small airfield in Margam should also be consulted. Early consultation with the above consultees is recommended. They advise that aviation matters can only be scoped out following consultation and agreement with the above	Consultation has been undertaken with Cardiff Airport in 2021, 2023, 2024 and 2025 and the Ministry of Defence in 2021 and 2023. Details of this are provided in ES Volume III, Appendix 4.4: Aviation Technical Appendix .

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		consultees. BCBC highlights that such a large development proposal with turbine heights of 230 m in elevated positions has the potential for significant aviation affects. Both LPAs note that aviation and the impact upon radar were major issues at a recent wind farm development, and that this is a critical consideration that cannot be agreed to be scoped out of the EIA process prior to thorough consultation with relevant consultees. The applicant's attention is drawn to detailed comments from the Defence Infrastructure Organisation (DIO) [The DIO Safeguarding Team represents the MOD], within which they state that the site falls within Low Flying Area 7 (LFA7). Therefore, aviation safety lighting would be required, and sufficient data must be submitted to ensure that structures can be accurately charted to allow deconfliction. NATS raised no concerns to the proposal, and no response was received from the Civil Aviation Authority. It is noted that the applicant intends to submit a standalone technical report for aviation matters; however, this should form part of the ES. Currently there is inadequate information to scope out aviation matters. PEDW therefore directs that aviation is scoped into the ES. The applicant should liaise with the consultees noted above to determine whether there would be any significant impact on radar or aviation.	Consultation with the Civil Aviation Authority (CAA) is not required as there are no non-radar equipped aerodromes within or close to the CAA approved consultation distance of 17 km. The closest is at Swansea, over 30 km to the west of the Site and the Proposed Development would not affect Swansea. Therefore, consultation with Swansea Airport is also not required. The Proposed Development will have no effect on the small airfield in Margam (Old Park Farm airstrip). Therefore, consultation with Old Park Farm airstrip is also not required. While aviation matters have not been included as a chapter in ES Volume II, an Aviation Assessment is provided within ES Volume III, Appendix 4.4: Aviation Technical Appendix and an Aviation Lighting Assessment has been undertaken and is presented in ES Volume III, Appendix 4.5: Wind Farm Aviation Lighting and Mitigation Technical Appendix. Any mitigation requirements, including aviation lighting, have been presented within ES Volume II, Chapter 2: Proposed Development Description.

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
Forestry	ID. 8	Two of the turbines are proposed within Graig yr Aber forestry area, which is managed by NRW. The EIA Scoping Report states that a Forestry Assessment will be undertaken; however, this is proposed to be submitted as a standalone document outside of the EIA. The EIA Scoping Report states that other impacts will be considered within other relevant chapters of the ES, including biodiversity and landscape and visual. The applicant's attention is drawn to comments from NPTC. They raise concerns with this approach given the limited information available on the extent of woodland loss at this stage. NRW has confirmed that the Forestry teams have been consulted on the high level proposal. PEDW recommends that the applicant continues to liaise with the relevant stakeholders regarding the proposal. Should NRW Forestry or Dŵr Cymru Welsh Water (DCWW) raise concerns during the pre-application consultations, the applicant may need to consider scoping forestry in as a standalone chapter. Given the responses to date, PEDW is of the view that this topic can be addressed in appropriate chapters of the ES and a standalone chapter is not required, as indicated in the EIA Scoping Report.	The turbines proposed in the Craig-yr-Aber Woodland have been removed from the Proposed Development; therefore, no loss of forest is now proposed and significant effects on forestry are not anticipated. As such, no Forestry Assessment is considered to be required. As proposed within the EIA Scoping Report, indirect impacts on forestry have been considered within ES Volume II, Chapter 8: Landscape and Visual and ES Volume II, Chapter 10: Terrestrial Ecology.
Glint and glare	ID. 9	The EIA Scoping Report states that a solar PV array is likely proposed as part of the development. Appendix B provides indicative locations for the solar arrays. BCBC states that it is difficult to scope out glint and glare at this stage, given the significant scale of the solar array in such prominent locations	A glint and glare assessment has been undertaken for the Proposed Development, the results of which are provided within ES Volume III, Appendix 4.6: Solar Photovoltaic Glint and Glare Study . The

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		on the hillside around settlements and in relative proximity to key transport routes. NPTC also highlights that it is difficult to scope out glint and glare on the basis of the limited information provided in the EIA Scoping Report. PEDW therefore advises that glint and glare cannot be scoped at this stage due to the limited information provided on the proposal and nearby receptors. The applicant should consider potential receptors including, but not limited to, residential properties, highways, PRoW and aviation. PEDW is of the view that this topic can be addressed in appropriate chapters of the ES (i.e. landscape and visual and aviation) and a standalone chapter is not required. PEDW therefore advises that glint and glare is scoped into the ES, but not as a standalone chapter. The glint and glare assessment referred to in the EIA Scoping Report should be included as a technical appendix to the ES.	assessment confirms that no significant glint and glare effects are anticipated and therefore glint and glare has not been scoped into the ES as a standalone assessment chapter. Information from the glint and glare assessment has been included proportionately within the relevant technical assessments (namely ES Volume II, Chapter 8: Landscape and Visual).
Heat and radiation	ID. 10	PEDW agrees this can be scoped out.	No further assessment of heat and radiation has been reported in this ES.
Major accidents and disasters	ID. 11	The applicant's attention is drawn to comments provided by the Fire and Rescue Service at Appendix 1. The EIA Scoping Report states that the applicant is considering a Battery Energy Storage System (BESS), and that they will also consider the requirement for an Outline Battery Safety Management Plan. There is a potential fire risk associated with certain types of batteries and large commercial solar arrays. PEDW therefore advises that the Proposed Development should include	As set out in ES Volume II, Chapter 3: Environmental Context and Reasonable Alternatives Considered , the BESS has been removed from the Proposed Development following feedback from statutory Pre-Application Consultation. Therefore, no further consideration of the potential major accidents or disasters associated with the BESS is required.

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		adequate measures to ensure that an isolated fire would not become widespread and lead to a major incident, particularly given the presence forestry on site. BCBC states that should a BESS be proposed, this may need further consideration in the ES. NPTC highlights that turbines 8 and 10 appear to be within topple distance of a highway and PRow. An assessment of this risk should be included in the ES; further comments are provided in the transport and traffic section below. PEDW advises that the above matters must be included in the ES; however, this can be addressed in appropriate chapters of the ES and a standalone chapter is not required. PEDW therefore advises that major accidents and disasters are scoped into the ES, but not as a standalone chapter. The above matters including topple distances and fire risk should be covered in relevant chapters.	With regards to PRow and topple distance, BCBC PRow and Highways Officer have been consulted on the proposed turbine locations via email, Teams meetings and site visit and have advised that they have no concerns with the proposed turbine locations. None of the proposed turbines are located within oversail (blade length) of existing PRow or highways and are located a minimum of 200 m (revised maximum height of the turbines) from a bridleway. Turbine T06 is located within NPTC and is located slightly within topple distance (200 m) from the highway, at 175 m, but would not oversail it. This is due to the requirement to meet the necessary ecological separation distances between the turbine and the adjacent woodland blocks, as well as accommodating the turbine hardstanding within the topography. As discussed in ES Volume II, Chapter 2: Proposed Development Description (paragraphs 2.5.31 to 2.5.34), turbines would automatically shut down during extreme weather conditions (such as extreme wind or cold) and would only restart, with a slow rotational speed, once conditions have subsided. Upon restarting it is

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
			considered that the risk to public safety would be extremely low given that any unthawed snow or ice would be small and lightweight enough to allow the rotor assembly to rebalance before restarting and would therefore not likely result in a major accident to users of nearby PRow or highways. Furthermore, the design and construction of the wind turbines will be completed in compliance with British Standards for Engineering and informed by detailed analysis of land conditions from site-specific ground investigations. Once complete and operational, regular maintenance checks and inspections of the wind turbines will be undertaken. This will ensure any risks associated with PRow or highways being located within topple distance are as low as reasonably practicable, as with any other built structure.
Material assets and waste	ID.12	The EIA Scoping Report proposes to scope out this matter, noting that indirect impacts such as release of greenhouse gas emissions, water consumption, amenity impacts, and ecological impacts will be assessed in other chapters in the ES. NPTC acknowledges this approach. However, they suggest that the impact on agricultural and forestry land should also be considered under this topic. BCBC states that further information is required on the	Detail on the need for infrastructure maintenance is set out in ES Volume II, Chapter 2: Proposed Development Description . As suggested in the Scoping Direction, the indirect effects associated with material assets consumption and waste generation has been assessed proportionately in ES

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		likelihood of aspects of the development needing to be replaced over the proposed 50-year lifetime of development. It is likely that the solar panels, batteries and possibly the turbine blades would need replacing during its lifetime. If that is the case, further information would be required to justify this aspect being scoped out of the ES. PEDW therefore advises that material assets and waste is scoped into the ES, but not as a standalone chapter. The above aspects should be covered in other relevant chapters.	Volume II, Chapter 14: Climate.
Population and human health – Socio-economics	ID.13	The EIA Scoping Report states that socio-economic impacts of renewable energy projects are usually considered in an EIA. However, as these assessments often conclude that such effects do not meet the threshold for significant, the applicant proposes to scope this matter out entirely. NPTC and BCBC state that socio-economic impacts should be considered in the ES for major development of this scale, and should fully assess its impact, both alone and in combination with other developments within the immediate and wider region. PEDW advises that a project specific assessment should be included. On the basis of the submitted information, socio-economic impacts cannot be scoped out. PEDW therefore directs that socio-economic impacts are scoped into the ES in a proportionate manner.	Socio-economic impacts have been assessed and scoped into the ES. The assessment is reported in ES Volume II, Chapter 13: Population.
Population and human health – Land use and public access	ID.14	NPTC states that potential impacts upon public access should be scoped into the ES. The EIA Scoping Report refers to the temporary or	The Proposed Development's potential effects on PRow has been considered in ES Volume II, Chapter 13:

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		permanent diversion of PRow that will occur as a result of the development. These impacts need to be considered in the ES. The applicant's attention is drawn to comments from BCBC's PRow Officer which highlight footpaths that may be affected. The officer recommends that the applicant liaises directly with them and the Bridgend Local Access Forum on the approach to the Outline Access Management Plan. Given the number of footpaths in and around the site, further information is required on land use and public access to inform the assessment in the ES. PEDW therefore directs that this matter is scoped into the ES.	Population and discussed further in ES Volume III, Appendix 13.1: Outline Access (PRow) Management Plan .
Population and human health – Human health	ID.15	NPTC recommends that Public Health Wales should be consulted and their views used to inform human health matters. PEDW is of the view that this topic can be addressed in appropriate chapters of the ES and a standalone chapter is not required. PEDW agrees with the EIA Scoping Report that advises that human health is scoped into the ES, but not as a standalone chapter.	Impacts on human health have inherently been assessed as part of the following chapters of the ES: • ES Volume II, Chapter 5: Land, Soil and Groundwater; • ES Volume II, Chapter 8: Landscape and Visual; • ES Volume II, Chapter 9: Noise and Vibration; and • ES Volume II, Chapter 12: Traffic and Movement.
Shadow flicker	ID.16	NPTC and BCBC states that inadequate information has been provided at this stage to justify shadow flicker being scoped out. Whilst the methodology for assessing receptors to be impacted is acknowledged, the results of this assessment would	A technical assessment has been undertaken which, following receipt of the Scoping Direction, has taken a conservative approach and considered dwellings within 3 km of the turbines

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		be required in order to determine whether it is appropriate to scope out this matter. BCBC also disagrees with the proposed approach to limit shadow flicker impact as set out in the EIA Scoping Report (a maximum of 30 hours per year and not exceeding 30mins per day). PEDW concurs with comments from the LPAs and advises that shadow flicker is scoped into the ES. A full assessment on receptors including residential dwellings, highways, PRoWs etc. should be undertaken to determine the impact on receptors, and the results used to inform the design and, if necessary, any mitigation measures. The applicant should consult with LPAs on the receptors to be included in the shadow flicker assessment. The applicant should note the comments regarding Shadow Flicker assessment in Section 5 of the Direction. The ES should provide a robust rationale for the methodology adopted.	(c.18 rotor diameters). In the absence of UK guidance on the significance of shadow flicker impacts, guidance from other countries as been used as guide. The assessment has concluded that there will be no significant shadow flicker effect on residential properties. Further detail is provided within the assessment at ES Volume III, Appendix 4.7: Shadow Flicker Impact Assessment.
Telecommunications	ID. 17	Given the feasibility assessment and consultation with relevant parties undertaken, PEDW agrees telecommunications can be scoped out of further assessment in the ES. However, this may need to be revisited if the consultees raise concerns that a significant effect is likely in regard to this matter.	A Telecommunications Impact Assessment is provided in ES Volume III, Appendix 4.8: Telecommunication Constraint Investigation. A JRC Mitigation Report is provided within the Annex of this Appendix. As noted in the assessment, the relevant communications providers have been consulted on the Proposed Development and do not consider there would be any significant adverse effects

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
			on their telecommunications links. Telecommunications has therefore been scoped out of the EIA, in accordance with the Scoping Direction.
Water - Cwm Risca Site of Special Scientific Interest (SSSI) and Cefn Cribwr Grasslands Special Area of Conservation (SAC)	ID.18	The EIA Scoping Report proposes to consider the impacts on these protected sites under the Biodiversity chapter of the ES, and to scope out a water chapter. NRW highlights that marshy grassland within the Cwm Risca SSSI is dependent on the existing hydrological regime. Therefore, any alterations to hydrology, and the impact on the SSSI should be fully assessed in a hydrology study and should be scoped into the ES. NRW notes the potential hydrological linkages with other designated sites Cefn Cribwr SAC, Bryn Bach SSSI and Caeau Cefn Cribwr SSSI. The proposed pollution prevention and mitigation measures, to be contained within a Construction Environmental Management Plan (CEMP), should take the potential impact on these sites into account. The CEMP should be a technical appendix to the ES. NRW also notes that there may be impacts to the Cwm Risca SSSI from access routes, the details of which have not yet been provided. Potential pollution impacts from the access roads will also need to be assessed for the watercourses that run between the site, and Cefn Cribwr SAC and Cwm Risca SSSI. Due to the limited information provided and the above concerns, PEDW advises that the hydrological impact on designated sites is scoped in.	A catchment analysis has been undertaken and provided in ES Volume III, Appendix 6.3: Water Framework Directive Screening. The information presented within has informed the assessments reported in ES Volume II, Chapter 6: Water and ES Volume II, Chapter 10: Terrestrial Ecology. Further detail on how this comment has been addressed is provided in the above chapters.

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
Water – Watercourses	ID.19	The applicant's attention is drawn to detailed comments from NRW regarding information to be included a CEMP, and the design of watercourse crossings including protection measures. NRW has also highlighted the necessary consents which may be required for works on or near the watercourses and for the treatment of site water with flocculant.	A watercourse crossing baseline assessment has been undertaken and is provided in ES Volume III, Appendix 6.1: Watercourse Crossing Baseline Assessment . Further detail on how this comment has been addressed is provided in ES Volume II, Chapter 6: Water .
Groundwater	ID.20	The EIA Scoping Report proposes to consider groundwater within the land and soils chapter. NRW has recommended that groundwater is considered a receptor in its own right, in accordance with The Environment Agency's approach to groundwater protection (publishing.service.gov.uk) and that groundwater is scoped into the water chapter. PEDW concurs with this approach.	Groundwater has been assessed as a receptor in its own right. However, the Applicant has reported the findings of the assessment within ES Volume II, Chapter 5: Land, Soil and Groundwater . The justification for this approach is set out in ES Volume II, Chapter 5: Land, Soil and Groundwater and ES Volume II, Chapter 6: Water .
Water	ID.21	NRW has noted that the mitigation measures in the EIA Scoping Report lack detail and do not appear to be tailored to specific impacts. Further information is needed to determine the potential impacts from all aspects of the development (i.e. borrow pits, deep foundations, underground cables, placement of solar panels) which should then be used to inform the proposed mitigation measures. NRW advises a Water Feature Survey should be undertaken to inform the impact assessment upon both quantity and quality of surface water and groundwater. The applicant should refer to NRW's full comments on	A Water Features Assessment has been completed and is provided in ES Volume III, Appendix 6.1: Watercourse Crossing Baseline Assessment . Further detail on how this comment has been addressed is provided in ES Volume II, Chapter 6: Water .

Factor/Matter	Scoping Direction ID	Comment	Applicant response/where relevant information is provided within this DNS application
		the content and timeliness of the Water Feature Survey. There is inadequate information available to scope out water at this stage. Therefore, PEDW advises that water is scoped into the ES. The applicant should liaise with the LPAs and NRW on the methodologies and results of the assessments detailed above.	

- 4.3.6 EIA is intended to be an iterative process that takes place alongside the design of the Proposed Development. As such, the process of scoping the assessment has been ongoing in response to design iteration of the Proposed Development. Since the submission of the EIA Scoping Report, the Proposed Development has been updated. The key amendments are:
- Reduction in the number of turbines (removal of turbines: T01, T02, T09 and T10; turbine references relate to the turbine numbering submitted at Scoping);
 - Amendments to the DNS application boundary, removing:
 - Craig-yr-Aber Woodland;
 - Part of the Dogs Unleashed Land to the south; and
 - Land west of Dogs Unleashed.
 - Removing plots of land to the north of turbine T03 and land north of Ffordd-Y-Gyfraith.
 - Adding a small land parcel with an area of approximately 4.7 ha in the south of the Site (immediately north of New Road) to within the DNS application boundary.
- 4.3.7 Regulation 17(4)(c) of the EIA Regulations 2017 states that an ES “...*must be based on the latest scoping direction issued (so far as the proposed development remains materially the same...*” In this case, the Proposed Development has been revised and certain aspects of the Scoping Direction are no longer applicable. Nevertheless, the remaining elements of the Proposed Development are materially the same.
- 4.3.8 During the assessment, additional information has become available, such as data from additional ecology surveys. Other information, including technical modelling, has further provided the opportunity to re-examine the scope of the assessment, but the scope in other respects has remained materially the same.
- 4.3.9 A summary of the scope which has been assessed in this ES, having full regard to and reflecting the Scoping Direction, is presented in **Table 4.2**.

Table 4.2 Summary of the Scope of this ES

Factor	Location within this ES
Land, soil and groundwater	ES Volume II, Chapter 5
Water	ES Volume II, Chapter 6
Cultural heritage	ES Volume II, Chapter 7
Landscape and visual	ES Volume II, Chapter 8
Noise and vibration	ES Volume II, Chapter 9
Terrestrial ecology	ES Volume II, Chapter 10
Ornithology	ES Volume II, Chapter 11
Traffic and movement	ES Volume II, Chapter 12
Population	ES Volume II, Chapter 13
Climate	ES Volume II, Chapter 14
Intra-project combined effects	ES Volume II, Chapter 15

- 4.3.10 Following receipt of the Scoping Direction, a number of factors/matters have been scoped out of the assessment. **Table 4.3** summarises this aspect of the process and the justification for scoping out these factors/matters.

Table 4.3 Factors/Matters Scoped Out of the Assessment

Factor	Justification
Peat	Two peat depth surveys have been undertaken to accompany the DNS application, the results of which are presented in ES Volume III, Appendix 5.3: Depth of Penetration Survey Report. A small parcel of peat was found within the Site and has been avoided by all infrastructure.
Air quality	An Air Quality Assessment has been undertaken to accompany the DNS application (ES Volume III, Appendix 4.3: Air Quality Assessment) and found that significant effects relating to air quality are not likely on human or ecological receptors.
Shadow flicker	A shadow flicker assessment has been undertaken to accompany the DNS application (ES Volume III, Appendix 4.7: Shadow Flicker Impact Assessment), which confirmed that there would be no significant effects on residential properties.
Glint and glare	A glint and glare assessment has been undertaken to accompany the DNS application (ES Volume III, Appendix 4.6: Solar Photovoltaic Glint and Glare Study), which confirmed there would be no significant effects on receptors.
Telecommunications	Following consultation with JRC and NGED (ES Volume III, Appendix 4.8: Telecommunications Constraint Investigation), it was confirmed that no mitigation would be required for the Proposed Development.
Major accidents and disasters	Major accidents and disasters only need to be assessed in the context of EIA where the existing design measures or legal requirements, codes and standards do not adequately control the potential for the major accident and/or disaster to occur. A review has been undertaken regarding the likely effects deriving from the vulnerability of the Proposed Development to risks of major accidents and disasters. With the exception major accidents associated with turbine proximity to PRoW, the review did not identify likely significant effects from any other major accidents or disasters that would require assessment under the EIA Regulations 2017 and therefore major accidents and disasters are not considered further in this ES. Risks associated with the turbines and the proximity to the PRoW and highways has been discussed in Table 4.2. In summary, adherence to the design standards would minimise this risk to as low as reasonably practicable. Therefore, no further assessment is considered to be required in the context of the EIA.

4.4 Consultation and Engagement

- 4.4.1 Consultation has been integral to the design of the Proposed Development, identification of existing environmental constraints and sensitivities, and identification and assessment of the likely environmental effects of the Proposed Development. In addition to the formal consultation undertaken in conjunction with the EIA scoping process, technical and public consultation has been undertaken.

Technical Consultation

- 4.4.2 As part of the EIA process, technical consultation with a range of statutory and non-statutory consultees has been ongoing. Details of the technical consultation undertaken for each assessment is provided in the respective environmental factor assessment chapters (**ES Volume II, Chapters 5 to 14**).

Non-Statutory Pre-Application Consultation

- 4.4.3 Exhibitions and forums were held at key stages in the development process to inform the general public and other interested parties of project alternatives and the emerging findings of the EIA, and to elicit comment and feedback on the Proposed Development.
- 4.4.4 An initial public exhibition to raise awareness in the local community of the Proposed Development was held on 20 September and 21 September 2023 at Kenfig Hill RFC and at Maesteg Sports and Social Club, at which the Proposed Development at project scoping stage was presented.
- 4.4.5 The feedback from the non-statutory pre-application consultation was analysed and influenced the emerging design.

Statutory Pre-Application Consultation

- 4.4.6 Statutory pre-application consultation started on 26 April 2025 and ended on the 08 June 2025. The aims of the statutory pre-application consultation were to:
- Set out final proposals, demonstrating how issues identified during earlier consultation have been accounted for and considered within the Proposed Development design;
 - Demonstrate how the proposals have evolved since non-statutory consultation, and how feedback has influenced this process;
 - Gain insight through listening to the views of local communities and other stakeholders about the updated proposals;
 - Ensure that the potential impacts of the Proposed Development have been taken into account as mitigation strategies are finalised;
 - Provide a robust evidence base for the DNS application, to demonstrate how community and stakeholder feedback has influenced the Proposed Development, where possible; and
 - Meet DNS criteria for adequacy of consultation.
- 4.4.7 Three in-person events, which were open for anyone with an interest in the proposals to attend, were held. Details of the events are provided in **Table 4.4**.

Table 4.4 Statutory Pre-Application Consultation Events

Event	Date	Time
Cefn Cribwr Athletic Club, CF32 0BA	29 April 2025	16:00 to 20:00
Llangynwyd Village Hall, CF34 9SW	30 April 2025	11:30 to 14:30
Coytrahen Community Centre, CF32 0EB	30 April 2025	16:30 to 20:30

- 4.4.8 Across the three face-to-face consultation events, there were a total of 91 attendees.
- 4.4.9 Statutory consultation brochures, feedback forms, the planning application (including non-technical summary) (available on tablets), consultation banners and visualisations were produced and displayed at the face-to-face events, to provide information about the Proposed Development.
- 4.4.10 In addition to the statutory publicity, a number of non-statutory consultation and engagement methods were employed to ensure that the local community and interested parties had the opportunity to find out about and contribute to the consultation. The methods of consultation utilised are set out below:
- Providing a bilingual (Welsh and English) leaflet advertising the launch of the statutory consultation period to 2,156 local addresses;
 - Providing letters announcing the launch of the pre-application consultation and offering a briefing on the proposals to stakeholders including community councils, local division representatives in BCBC and NPTC, and local Members of Parliament and Members of the Senedd;
 - Erecting site notices within and near to the Site;
 - Issuing written notices to landowners and occupiers of the land within and adjoining the Site;
 - Publicising the launch of the statutory consultation in local newspaper notices (both the Glamorgan Gazette and the South Wales Evening Post); and
 - The project website ("<https://mttenergypark.co.uk/>") which held all draft DNS application documents.
- 4.4.11 Details on environmental factor-specific consultation are set out in the 'consultation and scope' sections of **ES Volume II, Chapters 5 to 14**. Full details of the statutory pre-application consultation period, including how consultee comments have been considered and addressed (where relevant), are provided in the standalone **Pre-Application Consultation Report** which has been submitted to accompany this DNS application.
- 4.4.12 Following the statutory pre-application consultation period, further meetings were arranged between the Applicant's project team and key specialist consultees to discuss comments made on the draft DNS application during the statutory pre-application consultation period. Details of those meetings are provided in

4.4.13 **Table 4.5.**

Table 4.5 Meetings following Pre-Application Consultation Feedback

Consultee	Consultation method	Summary of purpose, discussion and outcome
BCBC – Planning Officers and Landscape and Visual Representative	Virtual Meeting 16 May 2025	The purpose of the meeting was to understand the concerns of BCBC and in particular their Landscape and Visual representative. The discussion largely focused on the solar, BESS and substation locations as the Landscape and Visual representative was accepting of the proposed turbine positions.
BCBC – Planning Officer and Landscape and Visual Representative	Site visit 05 June 2025	This meeting was a site meeting, following the previous virtual meeting, to further understand the context of the Landscape and Visual Officer's concerns and to discuss what changes may be able to alleviate these concerns. As before, the focus of this discussion related to the solar and BESS, as the Landscape and Visual Representative was accepting of the proposed turbine positions.
Cadw	Virtual Meeting 26 June 2025	The purpose of the meeting was to understand Cadw's primary concerns relating to the Proposed Development, discuss the potential for any unknown assets within the Site and agree the scope of proposed trial trenching. The Cadw representative confirmed that the proposed trial trenching approach was appropriate but that specific details would need to be agreed with Heneb. It was agreed that non targeted trenching throughout the Site would not be needed and would result in unnecessary environmental effects (e.g. land disturbance).
Heneb	Virtual Meeting 02 July 2025	The purpose of the meeting was to agree the extent of the trial trenching. It was agreed that the investigation would focus on the anomalies identified during the geophysical survey around the infrastructure proposed, with some further trenches proposed near to the on-site Scheduled Monuments to identify any associated unknown assets which could inform the setting of the designations.

Consultee	Consultation method	Summary of purpose, discussion and outcome
BCBC – Planning Officers and Landscape and Visual Representative	Email Correspondence 23 July 2025 to 01 August 2025	The Applicant shared an amended design proposal to BCBC officers via email. The amended design sought to alleviate the concerns associated with landscape and visual effects of the Proposed Development raised by the officers in relation to the statutory pre-application consultation design. Written feedback on the individual design changes was received during this period and it was noted that substantial concerns remained.
BCBC – Planning, Landscape and Visual Representative and Heritage Officer	Virtual Meeting 05 August 2025	This meeting directly followed on from the discussions held on 16 May 2025, site visit on 05 June 2025 and further email correspondence. The meeting discussed the Applicant's proposed changes to the layout and sought feedback on the proposed amendments.
	Email Correspondence 04 September 2025	Following the above meeting, written feedback was received on 04 September 2025. This feedback noted that the proposed amendments were welcomed by BCBC officers and acknowledged the positive approach adopted by the Applicant and the decision to work with BCBC to agree the amendments.
NRW – Development Planning Advisor and Contaminated Land Officer	Virtual Meeting 27 August 2025	The purpose of the meeting was to discuss the pre-application consultation response received from NRW. It included a discussion of the changes proposed following the pre-application consultation period, an overview of the baseline ground conditions, the likely effects of the Proposed Development and the mitigation proposed. It was agreed that intrusive ground investigation works would be required ahead of the development commencing and the Applicant proposed that this would be undertaken via condition discharge. NRW agreed that this is a suitable approach and advised that given the size of the Site, ground investigation in relation to contamination and groundwater could be targeted to focus on high risk contamination areas identified (e.g. historic landfills and

Consultee	Consultation method	Summary of purpose, discussion and outcome
		colliery spoil) where infrastructure is proposed. NRW provided wording for a draft planning condition in relation to ground investigation.

4.5 Approach to the Assessment of the Proposed Development

- 4.5.1 The method behind the EIA process considers the existing conditions of the area into which the development is being introduced (**the baseline**), providing a future baseline context for assessments where relevant, and makes reasonable worst-case predictions of the likely change (**the impact – in terms of magnitude**) that may occur during construction, operation and decommissioning. The predicted impact is considered in terms of key environmental and social aspects (**receptors**) present within the Site and surrounding area, and based on their sensitivity to change, the scale of the resulting change experienced by the receptor/resource (**the effect**) is then determined, along with a statement on whether the effect is significant or not in accordance with significance criteria.
- 4.5.2 Any mitigation measures required to avoid, prevent, reduce or, if possible, offset adverse effects are then considered and assessed, with the resulting residual effect being determined as significant or not.
- 4.5.3 Effects resulting from the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor (intra-project combined effects) and the combined residual (post-mitigation) effects of the Proposed Development and another project or projects on a single receptor/resource (inter-project cumulative effects) are also assessed. All the likely effects of the Proposed Development are reported within the **ES Volume II (Main Written Statement)** (this document), in addition to **ES Volume III (Supporting Technical Appendices)** and **ES Volume IV (Supporting Figures and Plans)**, as well as **ES Volume I (Non-Technical Summary)**, with any likely significant environmental effects specifically highlighted.
- 4.5.4 The Proposed Development has been assessed against the description, design principles and tolerances and supporting plans as detailed in **ES Volume II, Chapter 2: Proposed Development Description**. The maximum extent of the DNS application boundary and turbine or infrastructure footprint/height has been assessed as the worst-case situation. There is therefore some degree of flexibility to allow the Proposed Development to evolve (i.e., reduce in size) if necessary.
- 4.5.5 In order to avoid duplication of assessment, assumptions have been made in relation to measures to be implemented under existing or pending consents.

Defining the Study Area

- 4.5.6 Study areas have been defined individually for each environmental factor assessment, taking into account the geographic scope of the potential impacts relevant to that environmental factor and the information required to assess those impacts.
- 4.5.7 The proposed study areas for each environmental factor are described within **ES Volume II, Chapters 5 to 14**.
- 4.5.8 These study areas have also been used to inform the zone of influence for the purposes of assessing cumulative effects (see **Section 4.6**).

Establishing Existing Baseline Conditions

- 4.5.9 EIA provides a mechanism to predicts how environmental conditions may change as a result of a Proposed Development. The assessment of the magnitude of impact and then the resulting scale and nature of effect is undertaken against a reference condition, known as the baseline. The baseline represents the environmental condition of the site and the surrounding area at the time of the assessment.
- 4.5.10 Baseline information (environmental characteristics and conditions) utilises desk-based existing information available at the time of the assessment, as well as new information either collected through surveys undertaken during the EIA process or additional information provided as part of the EIA Scoping and the consultation process. **ES Volume II, Chapters 5 to 14** provide details of the current baseline conditions of the Site and surrounding area for each of the individual environmental factors. For the purposes of this ES, the baseline has been taken as the current conditions within the Site and the surrounding area, at the time of assessment (i.e. in the assessment year of 2025), although in defining the baseline conditions, data from preceding years may be used where the data remains relevant. The dates of surveys and the dates when data sources have been accessed are provided within **ES Volume II, Chapters 5 to 14**. The data are considered to accurately reflect current baseline conditions, as such conditions have not been subject to any significant or material changes.
- 4.5.11 A summary of the baseline information is provided in **ES Volume II, Chapter 2: Proposed Development Description**. The reports detailing the results of baseline studies or surveys are provided within **ES Volume III**.

Establishing Future Baseline Conditions in the Absence of the Proposed Development

- 4.5.12 Schedule 4(3) of the EIA Regulations 2017 requires consideration of the likely evolution of the current state of the environment (baseline scenario) in the absence of the Proposed Development, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge (the 'future baseline').

- 4.5.13 Whilst there are limitations to the predictions that can be made about natural baseline conditions at a future point in time, effort has been made to characterise the future baseline in the absence of the Proposed Development in the assessment for each environmental factor. **ES Volume II, Chapters 5 to 14** provide a description of the future baseline scenario and the data sources that have informed it (where relevant) for each environmental factor.
- 4.5.14 It should be noted that other developments are not considered within the future baseline scenario, as other developments are not considered to be a 'natural' change from the baseline scenario. Instead, other developments are considered within the inter-project cumulative effects assessment presented in **ES Volume II, Chapters 5 to 14**.
- 4.5.15 In general, environmental conditions at the Site over the lifetime of the Proposed Development are not expected to change markedly. The area would likely remain in mostly agricultural use and as such, may be subject to agricultural related small-scale developments. If the area is not maintained under agricultural (light grazing) conditions, then it may incur a degree of natural or managed re-wilding by growth of shrubs and trees. The Proposed Development would not necessarily be mutually incompatible with such change.
- 4.5.16 The UK Met Office's UK Climate Projection 18 (UKCP18) projections suggest that climate change will lead to hotter drier summers, warmer wetter winters, increased likelihood of extreme weather events (e.g., heat waves, high rainfall events) and sea-level rise. Due to the embedded resilience of wind turbines to high heat and wind speeds, and the distance of the Site from the coastline, these factors are not expected to significantly impact on the construction, operation or decommissioning of the Proposed Development. Flooding is not expected to have any significant impact on the Proposed Development, due both to the embedded resilience of wind turbines and the lack of recorded historical flooding within the Site.

Assessment Scenarios

- 4.5.17 The assessment scenarios considered for the Proposed Development are as follows:
- **Existing baseline (without the Proposed Development)** - Reported at the time that the baseline data has been collected.
 - **Future baseline (without the Proposed Development)** – For comparison with the construction phase, operational phase and decommissioning phase. It should be noted that without the Proposed Development, it is assumed that the Site would continue to be occupied for agricultural use.
 - **Construction of the Proposed Development** - As presented in **ES Volume II, Chapter 2: Proposed Development Description**, construction is expected to commence in 2029 and be completed in 2031 (a duration of approximately 24 months). Where relevant, environmental factor assessments have assessed the relevant 'worst case' construction scenario and where necessary, the relevant period or 'peak' of activity within the construction programme.
 - **Operation of the Proposed Development** – As presented in **ES Volume II, Chapter 2: Proposed Development Description**, it is assumed that the

Proposed Development will be operational and maintained for a duration of 50 years.

- **Decommissioning of the Proposed Development** (where appropriate) - As presented in **ES Volume II, Chapter 2: Proposed Development Description**, decommissioning activities are anticipated to begin following the cessation of the operational Proposed Development in 2081 and be completed in 2082 (a duration of approximately 6 to 12 months).

4.5.18 The ES assumes that there will be a need to repair or replace components of the Proposed Development that fail or degrade during the operational phase. It is anticipated that maintenance and servicing would include the inspection, removal, reconstruction, refurbishment or replacement of faulty or broken equipment, and adjusting and altering the components of the Proposed Development. These measures are set out in further detail within **ES Volume II, Chapter 2: Proposed Development Description**.

Assessment Assumptions

4.5.19 Assumptions adopted in the evaluation of impacts for each environmental factor are reported in each of the environmental factor assessment chapters (**ES Volume II, Chapters 5 to 14**). The principal assumptions that have been made, and any limitations that have been identified, in undertaking the EIA are based on expert judgment and are set out below:

- Baseline conditions have been established from a variety of sources, including historical data and are accurate at the time of writing;
- It is assumed that information received from third parties is accurate, complete and up to date;
- Where detailed information has not been available, reasonable assumptions have been made, and have been clearly set out, based on experience of developments of similar type and scale to enable assessment of likely significant effects; and
- Other developments will be implemented substantially in accordance with information that is publicly available and subject to the same regulatory regimes and good practice management controls as this Proposed Development.

Design Tolerances

4.5.20 Although the permission sought for the Proposed Development is for a fixed scheme, a degree of design tolerance has been implicitly and explicitly included. Implicitly the assessment has considered the maximum design envelope of the Proposed Development so that slight variation including reductions in scale and extent, would be accounted for by the assessment. Explicitly a degree of variability in actual construction extent has been allowed by adopting a micro-siting approach (see **ES Volume II, Chapter 2: Proposed Development Description**).

Embedded (Primary) Mitigation Measures

- 4.5.21 Mitigation can be relied on to reduce potential significant environmental effects from the construction, operation and/or the decommissioning of the Proposed Development. The sequential steps of the mitigation hierarchy are as follows:
- Avoidance: Take measures to avoid creating impacts from the outset;
 - Minimisation: Measure taken to reduce the duration, intensity and extent of the impact if they cannot be avoided;
 - Restoration: Measures taken to improve ecosystems following exposure to unavoidable impacts; and
 - Offset: Measure taken to compensate for any residual impacts.
- 4.5.22 As part of the EIA, an approach has been adopted where significant environmental effects have been avoided where possible in the first instance through design refinements and iterations. Where adverse environmental effects were identified through early assessment work, opportunities to reduce or control impacts and effects have been identified and incorporated into the Proposed Development. In accordance with IEMA's 'Environmental Impact Assessment Guide to Shaping Quality Development', this is known as 'primary' mitigation (hereafter referred to as 'embedded' mitigation). In addition, opportunities to enhance the beneficial environmental effects of the Proposed Development have also been sought and incorporated into the Proposed Development.
- 4.5.23 The Proposed Development has been through stages of design development which has resulted in the identification of mitigation measures that have been embedded into the design and layout of the Proposed Development.
- 4.5.24 For the purposes of this ES, embedded (primary) mitigation measures will form part of the design of the Proposed Development.
- 4.5.25 The embedded (primary) mitigation measures relevant to each environmental factor are detailed in **ES Volume II, Chapters 5 to 14**.

Assessment of Likely Effects (Without Additional Mitigation)

- 4.5.26 The assessment of likely effects (without additional mitigation) presented in **ES Volume II, Chapters 5 to 14** is a general commentary of the likely effects that could occur as a result of the construction, operation and decommissioning of the Proposed Development, taking account of the embedded (primary) mitigation that forms part of the Proposed Development being assessed, but in the absence of any additional mitigation measures. This general commentary sets the scene for the potential need (or otherwise) for additional mitigation measures to be considered.
- 4.5.27 The assessment criteria discussed below in **paragraphs 4.5.35 to 4.5.41** has not typically been applied to the assessment of likely effects (without additional mitigation).

Additional (Secondary and Tertiary) Mitigation Measures and Monitoring

- 4.5.28 In accordance with IEMA's 'Environmental Impact Assessment Guide to Shaping Quality Development', additional (secondary and tertiary) mitigation describes actions that will require further activity in order to achieve the anticipated outcome, and measures that will be required regardless of any EIA assessment, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices. Examples of secondary mitigation include additional detailed design, for example to comply with proposed lighting limits for the Proposed Development. Examples of tertiary mitigation include considerate contractor's practices that manage activities which have potential nuisance effect (i.e. through the implementation of a Construction Environmental Management Plan).
- 4.5.29 Where likely significant adverse effects have been identified in the assessment, measures to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment are described. In accordance with the EIA Regulations 2017, monitoring should be proposed (where appropriate) where significant adverse residual effects remain. In some cases, for instance where there is uncertainty over a residual effect, it may also be appropriate to implement monitoring.
- 4.5.30 Additional (secondary and tertiary) mitigation and monitoring measures are set out within **ES Volume II, Chapters 5 to 14**. The mechanism by which the measures are to be secured and implemented and the party responsible for their delivery is also recorded.

Assessment of Residual Effects (With Additional Mitigation)

- 4.5.31 The EIA process requires the identification of the likely significant environmental effects of the Proposed Development. The general approach to the determining the assessment of likely significant effects is detailed further below.
- 4.5.32 However, it should be noted that not all environmental factor assessments follow this approach. Where this is the case, that is explained within the relevant environmental factor assessment chapter (**ES Volume II, Chapters 5 to 14**).

Assessment Criteria

- 4.5.33 The following criteria have been taken into account when determining the significance of residual effects for the purposes of the ES:
- The receptors/resources (natural and human) that would be affected and the pathways for such effects;
 - The geographic importance, sensitivity or value of receptors/resources;
 - The duration (short-term, medium-term or long-term); permanence (permanent or temporary) and changes in significance (increase or decrease);
 - Reversibility - e.g. is the change reversible or irreversible, permanent or temporary;
 - Environmental and health standards (e.g. local air quality standards) being threatened; and

- Feasibility and mechanisms for delivering mitigating measures, e.g. is there evidence of the ability to legally deliver the environmental assumptions which are the basis for the assessment.

4.5.34 The method for assessing the significance of effects varies between environmental factors but in principle, this is based on the environmental sensitivity (or value/importance) of a receptor/resource that could be affected by the Proposed Development and the magnitude of change from the baseline conditions in order to derive the resultant effect, and whether the effect is significant or not.

Sensitivity/Value/Importance of Receptors

4.5.35 Within **ES Volume II, Chapters 5 to 14**, the ES has addressed the sensitive receptors associated with each environmental factor, considering their respective sensitivity/value/importance. This assessment is based on industry standards and guidance, quantifiable data, existing designations, and professional judgement where applicable and available.

Magnitude of Impact (Change)

4.5.36 The magnitude of impact or change is predicted as a deviation from the established baseline conditions, as a result of the construction, operation and/or decommissioning of the Proposed Development. The magnitude of these impacts/changes is defined within **ES Volume II, Chapters 5 to 14**, and has been determined, where available and appropriate, using quantifiable data, applicable national and international standards or limits and professional judgement.

4.5.37 The magnitude of impact/change identified is based on the peak potential magnitude of impact/change, representing the greatest likely magnitude of impact/change anticipated for a sensitive receptor (existing or proposed).

Significance of Effects

4.5.38 The approach to assessing and assigning significance to an environmental effect is derived from a variety of sources including legislative requirements, topic-specific guidance, standards and codes of practice, the EIA Regulations 2017, advice from statutory consultees and other stakeholders and the expert judgement of the team undertaking the EIA.

4.5.39 Determining the significance of effects has been undertaken using accepted industry standards and guidance and professional judgements that underpin the attribution of significance. Each effect has been assessed against the sensitivity/value/importance of the receptor and the magnitude of impact/change. For most environmental factor assessments, where more than one effect classification exists for any given scenario (i.e. slight or moderate), professional judgement is used to assign a single effect classification.

4.5.40 Unless otherwise stated in the environmental factor assessment chapters (**ES Volume II, Chapters 5 to 14**), effects that are classified as moderate or above are considered to be significant. Effects classified as slight or below are considered to be not significant.

4.5.41 Tables summarising the potential effects associated with each environmental factor, required mitigation measures and residual effects are provided at the end of each environmental factor assessment chapter (**ES Volume II, Chapters 5 to 14**). The tables provide a clear distinction of the type of effect, where relevant:

- Beneficial or adverse
- Permanent or temporary;
- Direct or indirect;
- Short, medium or long term;
- Secondary, cumulative or transboundary; and
- Significant or not significant.

Opportunities for Environmental Enhancement

4.5.42 Where the Applicant considers that opportunities for environmental enhancement exist, these are detailed within **ES Volume II, Chapters 5 to 14**. In particular, the EIA has considered the Net Benefit for Biodiversity within the context of the step-wise approach to the mitigation hierarchy (i.e. avoid, minimise, mitigate/restore, compensate on-site, compensate off-site) in accordance with PPW. However, in accordance with the EIA Regulations 2017, any enhancement opportunities proposed have not been taken account of within the respective environmental factor assessment conclusions, except where an impact could arise as a result of implementing an enhancement measure.

Difficulties and Uncertainties

4.5.43 Schedule 4(6) of the EIA Regulations 2017 states that an ES should include:

“...details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved...”

4.5.44 Where difficulties and uncertainties have been encountered within the EIA, these are identified in **ES Volume II, Chapters 5 to 14**.

4.6 Cumulative Effects

4.6.1 Schedule 4(5)(e) of the EIA Regulations 2017 states that the ES should include a description of the likely significant effects of the development on the environment resulting from:

‘the cumulation of effect with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.’

4.6.2 Regulation (4)(2)(e) refers to the need to assess:

“the interaction between the factors referred to in sub-paragraphs (a) to (d)”.

4.6.3 The following types of cumulative effects have been considered in accordance with the EIA Regulations 2017 and best practice guidance:

- **Intra-project combined effects** – the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor; and
- **Inter-project cumulative effects** – the combined residual (post-mitigation) effects of the Proposed Development and other developments on a single receptor/resource.

Intra-project Combined Effects

4.6.4 The approach to the assessment of interactions of environmental effects (intra-project combined effects) has considered the changes in baseline conditions at common sensitive receptors (i.e., those receptors that have been identified as experiencing likely significant effects by more than one environmental factor) due to the Proposed Development.

4.6.5 Further details regarding the scope and methodology of the assessment of intra-project combined effects is provided in **ES Volume II, Chapter 15: Intra-project Combined Effects**.

Inter-project Cumulative Effects

4.6.6 The approach to the assessment of inter-project cumulative effects has considered the deviation from the baseline conditions at common sensitive receptors as a result of changes brought about as a result of the Proposed Development in combination with one or more other development(s). The assessment of the inter-project cumulative effects is based upon the residual (post-additional mitigation) effects that have been identified in the various environmental factor assessments for the Proposed Development (**ES Volume II, Chapters 5 to 14**), as well as available environmental information for the other development(s).

4.6.7 There is no widely accepted methodology or good practice guidance for assessing inter-project cumulative effects in EIA, although relevant guidance is available in the Planning Inspectorate Advice Note titled 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024).

4.6.8 Therefore, in accordance with the 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024), the assessment of inter-project cumulative effects has followed four clear stages:

- **Stage 1:** establish a long list of other developments based on appropriate spatial and temporal limits.
- **Stage 2:** apply a clear rationale to establish a short list of other developments which, in combination with the Proposed Development, have the potential to result in a significant inter-project cumulative effect for inclusion within the assessment.
- **Stage 3:** Gather relevant information about the short list of other developments.
- **Stage 4:** Assessment.

- 4.6.9 The assessment of inter-project cumulative effects is presented in **ES Volume II, Chapters 5 to 14**.

Stage 1: Long List Methodology

- 4.6.10 The first task in establishing the long list of relevant other development(s) is to determine the 'search area'. For the purposes of this assessment, the 'search area' has been determined by affording consideration to the Zone of Influence (Zol) for each environmental factor assessed within this ES.
- 4.6.11 The Zol for each environmental factor is defined as the spatial area over which an effect is likely to be experienced. The Zol for each environmental factor has been identified based on the extent of the likely effects as identified as the study area in each of the individual environmental factor assessments (**ES Volume II, Chapters 5 to 14**), whilst also reflecting any additional area over which cumulative effects may occur for particular cumulative scenarios (e.g. sequential cumulative visual effects on users of linear routes).
- 4.6.12 The environmental factor-specific study areas presented in **ES Volume II, Chapters 5 to 14** are provided below in **Table 4.6**.

Table 4.6 Zones of Influence

Environmental factor	Zol(s)
Land, soil and groundwater	1 km
Water	600 m
Cultural Heritage	10 km
Landscape and Visual	20 km (up to 35 km in specific locations)
Noise and Vibration	5 km
Biodiversity	10 km
Ornithology	10 km
Traffic and Movement	10 km
Population	20 km

- 4.6.13 The overall combined 'search area' for the long list of relevant other development(s) has been based on the largest Zol (study area) in terms of distance, which in this case is 35 km.
- 4.6.14 Following the adoption of the 35 km Zol, a planning application search was undertaken to identify other developments within the 35 km Zol, using the planning portals of BCBC and NPTC, Developments of National Significance Casework Portal and the National Infrastructure Planning website. Additionally, the Applicant has liaised with BCBC to obtain information on any further developments that should, in the authority's opinion, be included in the inter-project cumulative effects assessment

- 4.6.15 Only the following types of other developments have been considered for inclusion on the long list, as the Applicant considers that any development that does not fall within these types would not likely give rise to a significant cumulative effect³:
- Nationally Significant Infrastructure Project or DNS developments⁴: Must lie within the ZOI of the Proposed Development.
 - Onshore wind developments (not classed as a DNS) (where the wind turbines are greater than 50 m to tip height and more than one wind turbine proposed): Must lie within the 35 km of the Proposed Development.
 - Other energy infrastructure developments must lie within 10 km of the Proposed Development.
 - Employment developments: Must lie within 10 km of the Proposed Development.
 - Residential developments: Must comprise 10+ dwellings and lie within 10 km of the Proposed Development.
 - Minerals and waste applications: Must lie within 10 km of the Proposed Development.
 - Transport infrastructure developments⁵: Must lie within 10 km of the Proposed Development.
- 4.6.16 Of the development types listed above, only those that meet one or more of the following criteria have been included on the long list:
- Projects that are under construction but that will not be completed prior to the Proposed Development commencing⁶;
 - Projects with planning permission granted within the last five years⁷, but not yet implemented;
 - Submitted applications, but not yet determined;
 - Refusals subject to appeal procedures not yet determined; and
 - Projects where an EIA Scoping Report has been submitted, but for which an application has not yet been submitted.
- 4.6.17 Projects that are at EIA screening stage have not been considered, as they do not have sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment, nor a high-level qualitative assessment.

³ Based on professional judgement with reference to EIA screening thresholds and reference to definitions of major development.

⁴ As defined by the Planning Act 2008 (as amended) and the Planning (Wales) Act 2015 and the Developments of National Significance (Wales) Regulations 2016 (as amended).

⁵ Trunk roads only, as smaller transport infrastructure proposals would not likely have a significant cumulative effect.

⁶ In accordance with 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024), other projects that are expected to be completed before construction of the Proposed Development, and the effects of those projects have been fully determined within their respective applications, are considered as part of the baseline.

⁷ A five-year period is considered a reasonable time period to capture all other developments that still have the potential to be built. Standard planning permission conditions typically state that development must be begun no later than the expiration of three years from the date of permission. Developments with planning permission older than five years will likely have been built or will not likely be built at all.

- 4.6.18 The full long list of other developments are presented in **ES Volume III, Appendix 4.9: Long List of Other Developments**.

Stage 2: Short List Methodology

- 4.6.19 Following the formation of the long list, the eligible other developments identified have been through further assessment (Stage 2) to establish a short list of other developments which, in combination with the Proposed Development, have the potential to result in significant inter-project cumulative effects.
- 4.6.20 The criteria used to determine whether to include or exclude a development on the short list reflects the process established by 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024) and has regard to relevant policy and guidance documents and consultation with the relevant statutory consultation bodies (particularly BCBC and NPTC). 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024) states that the criteria should address the following:
- **Temporal scope:** The relative construction, operation and decommissioning programmes of the other developments identified in the Zol together with the Proposed Development, to establish whether there is overlap and any potential for interaction.
 - **Scale and nature of development:** The scale and nature of the other developments identified in the Zol that are likely to interact with the Proposed Development. Statutory definitions of major development and EIA screening thresholds may be of assistance when considering issues of scale.
 - **Other factors:** For example, the nature and, or capacity of the receiving environment, which could make a significant cumulative effect with the other developments more or less likely. Consider using a source-pathway receptor approach to inform the assessment.
- 4.6.21 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024) suggests that professional judgement may also be used to supplement the threshold criteria and in order to avoid excluding other development that is:
- "Below the threshold criteria limits but has characteristics likely to give rise to a significant effect; or*
- Below the threshold criteria limits but could give rise to a cumulative effect by virtue of its proximity to the proposed project [i.e. the Proposed Development]"*.
- 4.6.22 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024) also notes:
- "Professional judgement could be applied to support the exclusion of other existing and, or approved development that exceeds the thresholds but may not give rise to evident effects. All the other existing and, or approved development considered should be documented and the reasons for inclusion or exclusion clearly stated."*

4.6.23 Taking the above into consideration, the other developments on the long list have been reviewed against the following criteria to form the short list of other developments:

- **Criteria 1:** The other development has a construction, operational and/or decommissioning phase that may overlap with any phase of the Proposed Development;
- **Criteria 2:** The other development and the Proposed Development share common sensitive receptors/resources which are assessed and described in the supporting environmental documentation, and have the potential to be significantly affected by the combination of the other development and the Proposed Development;
- **Criteria 3:** The other development has sufficient environmental assessment information readily and publicly available (including traffic flows) to inform the inter-project cumulative effects assessment. The assessment of each development on the short list will be proportionate to the environmental assessment information available⁸.

4.6.24 Where a development meets all the above criteria, it has been included on the 'short list' and has been taken forward for further consideration in the assessment. The 'short list' is detailed below in **Table 4.7**. The information provided in **Table 4.7** is accurate as of 03 October 2025.

4.6.25 The potential for each individual development listed within **Table 4.7** to result in significant cumulative effects with the Proposed Development differs between for each factor assessment. As such, whilst the complete list of other developments has been considered within this ES, not every development is subject to detailed assessment within the environmental factor assessment chapters (**ES Volume II, Chapters 5 to 14**). In order to determine which other developments are likely to result in significant effects, each environmental factor assessment has undertaken an initial screening assessment for all other developments within their Zol. Only those with the potential to result in cumulative effects have been taken forwards to further assessment.

Table 4.7 Short List of Other Developments

Application Reference and Name	Brief description	Distance (km) and direction from the Site
CAS-02505-N3T6M4 - Foel Trawsnant Windfarm Connection	66 kV electricity network infrastructure comprising overhead lines and underground cables which will start at Foel Trawsnant Wind Farm (grid ref: 283941 , 194161) in the north, heading south through the western edge of Maesteg (grid ref: 284482 , 191458) to	0.32 north

⁸ In the unlikely event that a development, which it is known will be progressed, but has insufficient environmental assessment information, a detailed inter-project cumulative effects assessment may not be possible. It may, however, still be prudent to consider the development in the inter-project cumulative effects assessment. The assessment may therefore take the form of listing the development and why it hasn't been considered in detail, or the potential inter-project cumulative effect could be discussed at a high level (qualitatively) using professional judgement.

Application Reference and Name	Brief description	Distance (km) and direction from the Site
	a connection point with the existing overhead line approximately 2 km south west of the settlement of Llangynwyd (grid ref: 284175, 187428).	
P/24/753/SOR - WEPA Vesta (Paper Machine)	New plant machine producing tissue paper at Bridgend and decommissioning and dismantling of old machine.	0.52 east
DNS CAS-03613-S7Y6S4 Prosiect Egni Glan Llynfi (Modular Nuclear)	The project will include 4 PWR-20 Modular Nuclear Reactor units, which will provide clean, carbon-free baseload electricity and heat to local industrial users. There will also be Grid, as well as private electricity & steam connections. There will be no air or water emissions from the plant.	0.8 east
CAS-01977-L5K6R7 -Eirlys Solar Farm	Solar development	0.92 west
DNS/3264571 – Y Bryn Wind Farm	Wind Farm - 18 turbines, up to 250 m in height	1.78 north
P/23/218/FUL - HyBont Green Hydrogen	Development of a green hydrogen production facility with electrolyzers, hydrogen storage, hydrogen refuelling station, admin building, substation and back-up generator; with access, circulation, parking, lighting, 8-metre-high wall, security fencing, hard and soft landscaping, and drainage infrastructure	2.55 south east
DNS CAS-04421-B8S4Q5 Y Bryn Wind Farm Grid Connection	An up to 132 kV (kilovolt) electricity connection comprising underground cables and overhead lines between Y Bryn Wind Farm and the National Grid Substation at Margam.	3.7 north west
P/22/225/FUL - Great Western Avenue, Coity Road, Battery Energy Storage	Battery Installation of a battery energy storage facility, substation, underground cabling and ancillary infrastructure & equipment to include security fence, CCTV & gates	4.15 south
DNS/3279521 - Ty'n Y Waun Solar	Solar development	4.69 east
P2021/1255 - Land West of Junction 38 M4	Full planning application of the development of a metal processing facility totalling 28,500 sq.m of floorspace comprising a powder	4.83 west

Application Reference and Name	Brief description	Distance (km) and direction from the Site
	processing plant (17,377 sq.m), warehouse and store (5,428 sq.m) office building (1,442 sq.m), amenity building (776 sq.m), laboratory (200 sq.m), services building (470 sq.m), substation (107 sq.m), phase 2 (2,700 sq.m), CCTV, storage tanks and plant, parking, servicing and roads and associated works. (Additional and Revised information including details of diversion of water main, Boundary treatment and Acoustic Fencing details, external lighting scheme, revised Noise Impact Assessment, Revised Health Impact Assessment, Revised Health Impact Assessment and Air Quality Clarification Information).	
P2022/0372 - Land At Kenfig Industrial Estate Margam	Wind Farm - 1 turbine, 100 m in height	5.31 south west
P2022/1048 - Cefn Gwrgan Road	Wind Farm - 1 turbine, 21 m in height	5.86 west
P2018/0153 and P2022/0517 - Foel Trawsnant	Wind Farm - 11 turbines, 145 m in height	6 north
DNS CAS-03678-M4Y0G7 – Upper Ogmore Wind Connection	Grid Connection (overhead line and underground cabling)	6 north
DNS/3213662 - Upper Ogmore	Wind Farm - 7 turbines, 130 m height	6.7 north
CAS-01773-Z5L1D0 - Mynydd y Gaer Wind Farm	Wind Farm - 9 turbines, 180 m in height	6.7 east
DNS/3213704 - Felindre Road - STOR	Installation of a stand-by energy generating station that when constructed will have an installed generating capacity of approximately 40 MW	8 north
P/20/42/FUL - Pant y Wal Extension (Phase 2)	Wind Farm - 2 turbines, 125 m in height	8.43 north east
11/1468/FUL - Taff Ely (repowering)	Wind Farm - 7 turbines, 110 m in height	9 east

Application Reference and Name	Brief description	Distance (km) and direction from the Site
P2014/0883 and P2022/0216 - Melin Court	Wind Farm - 5 turbines, 150 m in height	12.87 north
DNS CAS-03721-J2H3Y3 Afon Ddaw Solar and Energy Storage Project	Solar and BESS development	13.61 south east
DNS/3280378 Mynydd y Glyn	Wind Farm - 7 turbines, 175 m in height	15.72 east
DNS CAS-02125-Q0T5P0 - Llanwonno Energy	Wind Farm - 8 turbines, up to 200 m in height	17.45 east
CAS-02084-T4Z8W4 - Hifynydd Renewable Energy Park	Wind Farm - 7 turbines, 200 m height	18.82 north
DNS CAS-02114-J9X4S6 - Trecelyn Wind farm	Wind Farm - 5 turbines, 145 m in height	22 east
DNS/3272053- Twyn Hywel Energy Park	Wind Farm - 14 turbines, 200 m in height	22 east
DNS CAS-03540-M8J8M5 - Mynydd Llanhilleth Resubmission	Wind Farm - 7 turbines, up to 150 m in height	27 east
DNS CAS-02977-Y9F1W7 - Convatec Green Manufacturing Hub Rhymney	Wind Farm - 3 turbines, up to 150 m in height	30 north east
DNS CAS-03701-H3V4Y3- Rhyswg Wind Farm	Wind Farm - 4 turbines, up to 180 m in height	35 east

Stage 3: Information Gathering

- 4.6.26 This stage has involved sourcing further information relating to the shortlisted other developments, in order to establish the details of their likely environmental effects and potential for inter-project cumulative effect with the Proposed Development.

4.6.27 The other developments that form part of the short list have been subject to a review of environmental information, where available, including details of:

- Location;
- Programme, including construction, operation (including maintenance) and decommissioning;
- Baseline data;
- Effects arising from such other developments on common sensitive receptors; and
- Proposed design.

Stage 4: Assessment

4.6.28 There is no formal guidance on the criteria for determining significance of inter-project cumulative effects. The following principles have been considered in assessing the significance of inter-project cumulative effects, in accordance with 'Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment' (Planning Inspectorate, 2024) and in consideration of any mitigation measures required to avoid, prevent, reduce or, if possible, offset any identified significant adverse inter-project cumulative effects:

- The duration of effect (temporary or permanent);
- The extent of effect (the geographical area);
- The type of effect (whether additive or synergistic);
- The frequency of the effect;
- The value and resilience of the receptor affected; and
- The likely success of mitigation.

4.6.29 When considering the inter-project cumulative effects with other developments, it has been assumed that standard and good practice mitigation measures will be applied to the other developments (e.g. use of Construction Environmental Management Plans) and that such mitigation would be secured as part of any planning permission granted, if required. As such, it is appropriate to rely on these mitigation measures when completing the inter-project cumulative effects assessment.

4.6.30 The Applicant considers it not possible to assess all the inter-project cumulative effects of decommissioning activities as there is currently no mechanism to identify other developments that would be relevant at that time. However, where possible, an assessment has been completed. It is anticipated that further consideration of the potential inter-project cumulative effects of decommissioning will be a matter for the relevant consenting authority at the time.

4.7 Transboundary Effects

4.7.1 Regulation 56 of the EIA Regulations 2017 applies where development is likely to have significant effects in another European Economic Area. Due to the location of the Proposed Development and its nature, the Applicant considers that there is no possibility of significant transboundary (international) effects occurring.

4.8 Associated Development

- 4.8.1 Associated development is that which has a direct relationship with the principal development, i.e. either supports its construction or operation. In the case of the Proposed Development, it includes all works and infrastructure necessary to develop the generating station. Other development may be needed to deliver the Proposed Development e.g. off-site grid connection works or off-site highway works to accommodate the AIL. These off-site works will be subject to separate planning applications.
- 4.8.2 The Applicant has secured a connection to the Pyle sub-station. The connection of the substation to the grid would be subject to a separate planning application by the District Network Operator (DNO).
- 4.8.3 Any off-site upgrading works to the public road network will follow confirmation of procurement of the wind turbines and will be subject to a separate consent.
- 4.8.4 Given the off-site works are linked to the Proposed Development, and in order to understand the likely effects of the Proposed Development alongside the associated development, proportionate assessments have been undertaken, as reported in **ES Volume III, Appendix 4.1: High Level Grid Connection Assessment** and **ES Volume III, Appendix 4.2: High Level Abnormal Load Delivery Route Assessment**.

4.9 Coordinated Assessment with Habitats Regulations Assessment and Water Framework Directive Assessment

- 4.9.1 Whilst the over-arching objectives of EIA and Habitats Regulations Assessment are similar, the scope, level of detail and terminology used varies. As such, these processes have been undertaken separately. However, the scope presented within this ES has been developed to ensure that the needs of these processes have been considered to ensure a coordinated assessment compliant with Regulation 26 of the EIA Regulations 2017.

4.10 References

HEMA (2015), Environmental Impact Assessment Guide to Shaping Quality Development.

Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment'. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment>

Welsh Government (2024). Planning Policy Wales. Edition 12.

Welsh Parliament. The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017